



HAZELTON WASTE MANAGEMENT FACILITY

2022 Annual Report

Prepared for:
British Columbia Ministry of
Environment & Climate Change Strategy
EnvAuthorizationsReporting@gov.bc.ca

Prepared by:
Regional District of Kitimat-Stikine
Suite 300 - 4545 Lazelle Avenue
Terrace, BC V8G 4E1





Executive Summary

The Hazelton Waste Management Facility (HWMF) is owned and operated by the Regional District of Kitimat-Stikine (RDKS) in accordance with the Ministry of the Environment and Climate Change Strategy (ENV) Operational Certificate (OC) MR-17226. The HWMF services commercial and residential homes in the greater Hazelton area, which includes the community of South Hazelton, east to Witsset, and north up the Kispiox Valley. Waste collected at the Kitwanga Transfer Station is consolidated and hauled to the HWMF for landfilling. The following communities use the Kitwanga Transfer Station: Cedarvale, Kitwanga, Gitsegukla, Gitwangak, and Gitanyow.

In 2022, a total of 6,488 tonnes of waste was received at the HWMF, including 6,106 tonnes of refuse were deposited into the landfill, and 382.4 tonnes of waste which were recycled or diverted from the landfill, including tires, cardboard, metal, and clean wood. Septage was also diverted from landfill.

There were no instances of mammalian wildlife breaching the facility fence observed during 2022 at the Hazelton Waste Management Facility. There was minimal vector activity from birds, including raptor species (bald eagles), and corvid species (crows and ravens).

The RDKS submitted one non-compliance for quality exceedances to surface water and groundwater exceedances. The RDKS received temporary authorizations in 2022. One for report submissions due dates, and a temporary authorisation to accept Avian Flu infected bird carcasses from the region. No Avian Flu infected bird carcasses were received at the site in 2022.

The RDKS planted approximately 500 Alder cuttings into the upper, middle and lower stands of the phytoremediation orchard. The facility also had one authorized burn of clean wood waste in September. The three facility samples as well as all five boreholes, four shallow ground wells and five surface water locations were sampled and monitored according to the requirements of the OC. The details of the Facility water quality monitoring program are discussed in the *Hazelton Waste Management Facility 2022 Annual Environmental Effects Report*, prepared by Stantec, and contained in Appendix A of this report.



[This Page Left Intentionally Blank]



Contents

Executive Summary.....	i
1 Introduction	1
2 Background	1
2.1 Landfill.....	2
3 Waste Disposal.....	2
3.1 Landfilled Wastes.....	3
3.2 Diverted Wastes.....	4
3.3 Effluent Discharge.....	5
3.4 Open Burning	5
4 Wildlife Occurrences and Observations.....	6
4.1 Bird and Vector Control	6
5 Operations and Maintenance	6
5.1 Complaints Received.....	6
5.2 OC Amendments and Authorizations	6
5.3 Non-Compliance Reports.....	6
5.4 Leachate Collection System	7
5.5 Phytoremediation	8
5.6 Fence Maintenance.....	8
5.7 Operational and Maintenance Expenditures.....	8
6 Construction.....	8
6.1 Expansion Works.....	8
6.2 Closure Works	8
7 Projected Operational Plan.....	9
8 Environmental Monitoring.....	11
9 Summary	12



Appendix A	Operational Certificate	A
Appendix B	Environmental Monitoring Report.....	B
Appendix C	OC Temporary Authorisations	C
Table 1:	Report Objectives.....	1
Table 2:	Landfilled and Diverted Waste Volumes.....	3
Table 3	Summary of the Non-Compliance for the Facility During 2022.	7
Table 4	Summary of Key Strategies for Operations of HWMF Over the Next Twelve Months.	10




1 Introduction

The Hazelton Waste Management Facility (HWMF) is operated under Operational Certificate (OC) MR-17226, issued by the Ministry of Environment (ENV) in May 2013, and most recently amended in October 2021 (Appendix A). The OC requires the owner to submit an operational and environmental annual report for each 12 month period. This report fulfills the operational reporting requirements, and captures major works and projects completed in the same year.

Objectives of the 2022 Annual Report are summarized in Table 1.

Table 1: Report Objectives

<p>Waste Tracking</p> <ul style="list-style-type: none"> Quantity of MSW Received, Recycled and Composted Quantity of Liquid Waste Received <p>Wildlife Observations</p> <p>Facility Updates and Maintenance</p> <ul style="list-style-type: none"> Phytoremediation Operational Certificate Amendments Environmental Monitoring 	
--	---

The OC authorizes the discharge of municipal solid waste and liquid wastes and outlines the criteria for environmental and human protection at HWMF. Environmental Requirements for surface water, groundwater, and leachate are prescribed in the Environmental Effects Monitoring Program (EEMP) of the OC. The results of the EEMP are discussed in the Environmental Monitoring Report by Stantec Consulting Ltd and contained in Appendix B of this report.

2 Background

The Hazelton Waste Management Facility (Hazelton WMF) is owned and operated by the Regional District of Kitimat-Stikine (Regional District or RDKS). It is located approximately 4 km east of New Hazelton at 82 Birch Road; access is from Highway 16 as seen in Figure 1.

The Hazelton WMF is responsible for the management of municipal solid and liquid waste generated from commercial and residential sources in the greater Hazelton area, which includes the community of South Hazelton, east to Witset, and north up the Kispiox Valley. Waste collected at the Kitwanga Transfer Station is consolidated and hauled to the Hazelton WMF for landfilling. The following communities use the Kitwanga Transfer Station: Cedarvale, Kitwanga, Gitsegukla, Gitwangak, and Gitanyow. The Hazelton WMF is operated in accordance with the Regional District Kitimat-Stikine Solid Waste Management Plan (1995).



Landfill operations are regulated by the Ministry of Environment and Climate Change Strategy (ENV) Operation Certificate MR-17226, most recently updated in October 2021 and conducted in accordance with the Design, Operations, and Closure Plan (DOCP) for Hazelton Waste Management Facility, authored by Sperling Hansen and Associates (2018). This annual report follows criteria outlined in the amended Operational Certificate issued October 19th, 2021.



Figure 1 Location of the Hazelton Waste Management Facility.

2.1 Landfill

The HWMF serves the Hazelton and Kitwanga area. Waste from the Kitwanga Transfer Station is hauled to the HWMF. Some communities in the Hazelton area provide residential curbside collection, which is hauled to the HWMF. The facility also provides disposal and diversion services to many residents and businesses who self-haul their garbage. Metal (including scrap, propane tanks, and large appliances), tires, and cardboard (commercial and residential) are collected and stored at the facility for recycling. Clean wood is segregated and burned on site as outline in the OC.

3 Waste Disposal


The OC permits the discharge of municipal solid waste, municipal liquid waste, asbestos, and contaminated soil (with contaminants in concentrations less than “hazardous waste” as defined by the Hazardous Waste Regulation). Some types of municipal solid waste are considered Controlled Waste by RDKS bylaw 688, including: animal carcasses (over 50 kg), loads of construction and demolition debris or land clearing debris greater than 5 m³, contaminated soils, clean soils, broken asphalt and concrete up to 30 cm in diameter, and waste ash from incinerators.

The annual totals for 2022 of each type of permitted waste discharged at the Hazelton Landfill are shown in Table 2. Additional details about each of these materials is described below.



Table 2: Landfilled and Diverted Waste Volumes

Waste Type	Cubic Metres	Tonnes
Landfilled Waste	23,029	6,106
Asbestos Waste	-	.1
C&D	4,097	1,176
Land Clearing	170	25
Refuse	22,858	3,729
Diverted Waste		382.4
Broken Concrete	40.2	21
Cardboard	-	93
Clean Wood	225	23
Metal	-	242
Soil	-	-
Tires	336 ²	3.4
¹ Units are in metric tonnes.		
² Individual tires		
Total		6,488.4



3.1 Landfilled Wastes

Landfilled waste is disposed in the active face of the landfill. This waste includes asbestos, C&D, land clearing waste, and refuse.

Asbestos

Asbestos containing waste, including waste asbestos as defined in the HWR, generated from residential, commercial, and institutional customers is accepted in the Hazelton Landfill through the Controlled Waste application process. Asbestos containing waste is received at the landfill using approved containment methods under Section 40 of the HWR and is accepted by scheduled appointment for immediate burial in the landfill.

No asbestos containing waste was disposed of at the landfill in 2022.

Construction and Demolition

C&D waste accepted at HWMF includes painted and treated wood waste, demolition waste, construction waste products. In 2022, **4,097 cubic metres** of construction and demolition waste was disposed of in the Hazelton Landfill.



Land Clearing Waste

Land clearing waste is defined as waste produced from the clearing of land for development, including trunks, stumps, tree branches 75 millimeters in diameter or greater, treetops, and whole trees. Land clearing debris does not include other organic materials, such as vegetative matter, tree branches under 75 millimeters, and compostable structural wood waste. Due to presence of rock and gravel within this land clearing debris, this material is often deposited in the landfill. In 2022, **170 cubic metres** of land clearing debris were disposed of in the landfill.

Refuse

Refuse includes general municipal solid waste transferred from the KTS (commercial and self hauled refuse, and small loads of C&D waste), commercial and self hauled refuse from the Hazeltons. In 2022 **22,858 cubic metres** of refuse was received from HWMF.

3.2 Diverted Wastes

The Hazelton Landfill restricts the disposal of recyclable materials that have other disposal options available. The District of New Hazelton provides residents with biweekly collection of recycling (unlimited quantities). Residents of other communities may access recycling depots run by industry-funded programs for no fee. Commercial waste generators are responsible for making their own arrangements to have some restricted materials collected separately and taken for processing.

The RDKS provides drop-off facilities for restricted materials that are not already managed by other operators in the service area. These include clean wood waste, metals, cardboard (primarily for commercial customers, although open to all site users) and tires.

Broken Concrete

Concrete includes concrete with or without rebar, in pieces less than 300mm at their widest width. Broken concrete is used as alternative daily cover for waste. In 2022, **40.2 cubic metres** of broken concrete was received at the facility.

Cardboard

During 2022, **92.50 tonnes** of corrugated cardboard was collected at the Hazelton Waste Management Facility. The volume of cardboard was provided through the EPR Steward Reports then converted using the U.S. EPA's Volume to Weight Conversion Factors (2016) Old Corrugated Containers Flattened.

Clean Wood Waste

Clean Wood means wood that is free of glue, laminate, paint, treatment, and may include small metal fasteners but does not include plywood or OSB. Clean wood is segregated, and either burned as prescribed in the Operational Certificate or chipped and used as hog fuel in the compost facility. In 2022, **102.25 cubic metres** of clean wood was received at the HWMF facility.



Metals

Metals are segregated onsite and sold at market value to scrap yards. During 2022, **242.06 mT** of metal were recorded as received at the facility. The tonnage of metal was provided through the EPR Steward Reports.

Septage

Septage is defined as septic tank pumpage and treated sewage sludge, but does not include other sewage wastes (wastewater, sewage, or slurry, including catch basins, oil water separators, shop floor drains). Septage is disposed in the Hazelton septage receiving lagoons. The facility has two available for disposal. The liquid fraction is decanted into the treated in the leachate treatment system.

The volume of septage for 2022 totaled **32.16 cubic metres**.

Tires

In 2022, a total of **336** individual tires were collected at the Hazelton Waste Management Facility for diversion through the Tire Stewardship of British Columbia.

3.3 Effluent Discharge

In May 2022, a PT2X pressure transducer was installed by a hydrogeologist from Waterline Resources at the wetland 4 discharge weir outlet. The pressure transducer was installed in order to gain a more accurate understanding of the volumes of treated leachate being discharged to the environment by the facility. Since data collection started part way through the year in 2022, there has not been a full year of data collected to accurately determine discharge volumes for the facility for the year covered in this report.

The RDKS is looking to assess how to also measure the volumes of treated leachate discharged to the phytoremediation orchards in order to gain a complete understanding of the total volumes of treated leachate discharged by the facility. The total volume of treated leachate discharged by the facility was not ascertained for 2022.

3.4 Open Burning

There was one burn that took place on site during 2022. The fire was ignited on September 4th, 2022, at 4:30pm with a good venting index of 71 and winds of 9km/hr. The volume of wood burned was approximately 225m³. The fire suppression available on site during the burn consisted of a 323 excavator and 924 loader with gravel, as well as fire extinguishers and a water tank. The burn was extinguished on September 5th, 2022 at 6:45pm with a good venting index of 87 and windspeeds of 15km/hr. The material left at the end of the burn was approximately 3m³ in volume.



4 Wildlife Occurrences and Observations

The Hazelton WMF is located in an area with bears, wolves, coyotes, several species of birds of prey, and many other species of mammals that may attempt access to the facility. To prevent wildlife from gaining access, the entire facility is enclosed in a 2.1-metre-high composite electrified fence. To prevent vectors from gaining access to the landfill active face, Revelstoke Iron Grizzly (RIG) plates are used as alternative daily cover and are positioned on the active face at the end of each day to cover all waste. Soil from site is used as intermediate cover.

Facility operators are required to inspect the fence line daily, testing for proper voltage, proper tension on fence stands, overall condition of the fence, and signs of wildlife activity. The results of the inspections are recorded on the Daily Operation Inspection Forms.

There were no mammalian wildlife incidents or encounters observed during 2022 at the Hazelton WMF.

4.1 Bird and Vector Control

Birds, such as ravens and crows, are a nuisance at landfill sites, as they can scatter litter into the surrounding environment. Bird control at Hazelton WMF is based on thorough and complete cover of waste. The active face is only exposed when a load of waste is delivered to the landfill. Between loads, the active face is covered with the RIG plates or alternative daily cover. There was minimal vector activity from birds reported, including raptor species (bald eagles), and corvid species (crows and ravens).

5 Operations and Maintenance

5.1 Complaints Received

No complaints related to HWMF were recorded in 2022.

5.2 OC Amendments and Authorizations

In 2022, the RDKS did not receive any OC amendments. There were two temporary authorizations granted in 2022. The first one granted the RDKS permission to submit the Annual EEMP and Operations report after the OC specified date of June 30th. The second temporary authorization was for the disposal of carcasses, potentially infected with Avian Influenza, to be landfilled. Both authorizations can be found in Appendix C.

5.3 Non-Compliance Reports

There was one non-compliance report submitted for the HMWF in 2022. The non-compliance encompassed exceedances that occurred over the year for soil, facility discharge, groundwater, and surface water. A summary of the non-compliances is listed below in Table 3.



Table 3 Summary of the Non-Compliance for the Facility During 2022.

Non-Compliance Report Date	Description of Non-Compliance
November 16, 2022	
Section 11.1 Treated Effluent to Phytoremediation Stand	The composite soil sample collected from the phytoremediation orchard prior to discharge exceeded the BC CSR-IL for total arsenic
November 16, 2022	
Section 9.1.5 Characteristics of Discharge	The characteristics of the effluent discharged to the phyto orchard or wetland #4 infiltration trench exceeded the OC criteria
November 16, 2022	
Section 10.9 Groundwater Quality Assessment	The groundwater quality measured at SGW-02, SGW-04, SGW-05 exceeded the CSR-DW standards
November 16, 2022	
Section 11.4 Surface Water Monitoring	The surface water quality analyzed at SW-01, SW-02, SW-05 and SW-07 exceeded the BCWQG-AW standards.



Follow up actions to be taken in response to the exceedances include an additional composite soil sample will be taken from a location offsite from the landfill in 2023 to determine if the arsenic is naturally occurring.

An additional background surface water site will be sampled in 2023 from an area not influenced by the landfill or rifle range for better comparison to downstream water quality data. The RDKS intends to seek recommendations in the review of the EEMP to improve the monitoring in surface and groundwater at the site.

5.4 Leachate Collection System

The HWMF operated as a natural control landfill for decades, with large natural buffer zones around the site that successfully attenuated the leachate. With the expansion of the landfill a liner, leachate collection and treatment system were commissioned. The landfill also started to incorporate progressive closure as a means to reduce leachate generation potential.

The existing glacial tills present on site had a sufficiently low permeability to act as natural clay liner. Leachate was collected in a gravel layer above the liner and conveyed to the leachate treatment system through gravity flow HDPE collection pipe. Leachate makes its way to the equalization pond where it had BOD reduced and some ammonia removed, before eventually starting the process of flowing through the four treatment wetlands during the spring, summer and fall months. The wetlands reduce the



remaining nutrients and worked on some polishing functions. The movement of leachate through the wetland system requires it to pass through a sand filter, which further removes suspended solids. Finally, treated leachate is discharged to the phytoremediation orchard and/or the wetland 4 outlet to the exfiltration ditch.

5.5 Phytoremediation

The phytoremediation orchard irrigation system and the leachate treatment system were started back up in March 2022, with system resuming discharge to the orchard in April 2022. Spring re-commissioning included a check of all spitters and tubing being in adequate working condition prior to discharge. The system was drained and prepared for winter storage during the month of November 2022. There was no brushing or pruning maintenance performed on the phytoremediation orchard during 2022.

Over the course of 2022 there was some improvements made to the phytoremediation orchard. On May 18th, 2022 portions of the orchard that had become over inundated with surface water were ditched to enhance drainage and reduce saturation of the ground in areas where previously planted trees had not taken successfully. On May 19th, 2022, approximately 500 18" 407 *Northern Native* (NN's) Alder cuttings were planted throughout the three orchard terraces.

Damages to the lateral line of the treated leachate distribution system were identified on the top terrace. The line was repaired and as well as approximately 40-60 spitters were replaced.

The volume of treated leachate discharged to the phytoremediation orchards was not tracked during 2022.

5.6 Fence Maintenance

Basic maintenance and repairs were performed as part of regular operations and no major capital works.

5.7 Operational and Maintenance Expenditures

Approximately \$850,000 was spent on Operations and Maintenance activities in 2022.

6 Construction

6.1 Expansion Works

No expansion works were performed in 2022.

6.2 Closure Works

No closure works were performed in 2022.



7 Projected Operational Plan

The projected operational plan outlines the key strategies for the efficient and sustainable operations of the Hazelton Management Facility (HWMF) for the next 12 months as required by the HWMF Operational Certificate. As a responsible waste management organization, we recognize the significance of managing waste effectively to protect the environment, promote public health, and ensure compliance with relevant regulations.

By implementing this operational plan, we aim to achieve our objectives of meeting the environmental and regulatory requirement, maximizing resource recovery, and maintaining a safe and environmentally responsible operation.

This plan will outline the various projects and improvements intended to be executed in the next 12 months, the processes involved, timeline and expected outcome. It will also outline the various strategies mapped out to reduce contamination and encourage diversion.

By adhering to this operational plan and working collaboratively with our stakeholders, we are confident that we will achieve our goals of efficient waste management, reduced environmental footprint, and a cleaner and healthier community. We are committed to regular evaluation, monitoring, and adaptation of our operations to remain at the forefront of waste management practices and technology.

A list of tasks slated for completion in 2023 is included in Table 4. Tasks are subject to budget approval and may change or be deferred subject to competing priorities following a risk-based approach.



Table 4 Summary of Key Strategies for Operations of HWMF Over the Next Twelve Months.

2023 Plan	Description	Strategies	Expected Completion Date	Outcome
Septage Bay 1 Repair	One of the excavated septage bays at HWMF designed as part of a treatment process for residential septage does not retain septage as intended	The Regional District of Kitimat-Stikine (RDKS) intends to have the existing pond cleared of the manhole, filter cloth gravel layer, reshaped, compacted and have a liner with drainpipe and filter medium installed.	Sep-23	Two functioning septage bays to allow for dewatering and maintenance of bays without interruption to service
Install a flow monitor for phyto discharge	A flow monitor is needed to quantify to the discharge volumes of treated effluent to the phytoremediation orchard	Install a flow monitor and implement a data tracking procedure	Apr-23	Improved reporting, and data management
Recycle BC drop off Program	This program is responsible for residential PPP recycling in BC. RDKS partnered with RecycleBC to operate a depot at Kitwanga transfer station to make it easy for communities and first nations to recycle effectively	Discussion is ongoing to establish another depot in Hazelton to make it easy for communities closer to Hazelton to join RecycleBC and increase the level of participation.	Sep-23	More than 12 communities joining the program.
Water Balance Study	Understanding the hydrological influxes of water cycles help make improvements to the nutrient content of the ground and surface water behaviour.	Conduct a water balance study and phytoremediation update study.	Sep-23	Updated hydrogeological model for the site
Phyto Orchard Maintenance	Phytoremediation in the HWMF acts as the final stage of waste treatment. Currently tall grasses and weeds are competing with the newly planted saplings	Apply mulch to suppress weed and willow growth so to increase the success of newly planted saplings	Aug-23	Increased tree growth and increased uptake of effluent from the soils
Review and Update Exceedance Response Plans	Exceedance Response plans for surface water and groundwater require updating	Engage QP to identify contaminants of concern for surface and groundwater and draft exceedance response procedures for reporting and response	TBD	Improved response and reporting of exceedances to surface water and groundwater



8 Environmental Monitoring

The RDKS performed regular monitoring and sampling of surface water, groundwater, phyto orchard soil, and leachate at the HWMF in accordance with the OC. The details of the Facility water quality monitoring program, including results of groundwater, surface water, and treated leachate discharge monitoring are discussed in the *Hazelton Waste Management Facility 2022 Annual Environmental Effects Monitoring Report*, prepared by Stantec, and contained in Appendix B of this report.

Groundwater

Five monitoring well monuments with a total of 7 groundwater wells were sampled and monitored in 2022. Two of the monuments, contained nested wells (BH-4A & B as well as BH-5A & B). Two monuments were located upgradient, one downgradient and two cross-gradient of the landfill. The wells were monitored quarterly and sampled annually. In-Situ parameters were monitored using a YSI and TLC Depth Tape. Lab parameters were collected in sample bottles and shipped to ALS for analysis.

Shallow Ground Wells

Four shallow-ground wells were sampled and monitored over the course of 2022. These compliance points were included in the Groundwater section of the OC. The sites were monitored quarterly and sampled during the Spring, Summer and Fall if water was present at the location. In-Situ parameters are monitored using a YSI, a LaMotte Turbidity Meter and flow meter. Lab parameters were collected in sample bottles and shipped to ALS for analysis.

Surface Water

Five surface water sites were sampled and monitored for this facility. The sites were monitored and sampled at a minimum annually, and ideally once during the Spring, Summer and Fall if discharging during these seasons. In-Situ parameters were monitored using a YSI, a LaMotte Turbidity Meter and flow meter. Lab parameters are collected in sample bottles and shipped to ALS for analysis.

Facility

There were three facility compliance points sampled and monitored in 2022. One was for treated leachate prior to discharge to the Phytoremediation area, another was a Composite Soil sample from the Phytoremediation area and the last one was for treated leachate at the Wetland 4 Outlet, where treated leachate was discharged to the receiving environment. The treated leachate prior to the Phyto orchard was monitored and sampled once prior to the first discharge of the year (spring) and once per summer and fall. It was monitored with a YSI as well as with a LaMotte Turbidity Meter. The phytoremediation soil was sampled once annually, prior to the start of discharge. The Wetland 4 Outlet was sampled and monitored once prior to the first discharge of the year (Spring) and once per Summer and Fall, or monthly if discharging at any time during other months. This compliance point was monitored with a YSI as well as with a LaMotte Turbidity Meter. The level of treated leachate at the weir notch was also noted for approximate flow. Lab parameters for each of these points were collected in sample bottles and shipped to ALS for analysis.



9 Summary

HWMF received an estimated 6,106 tonnes of waste into the landfill, and an estimated 382.4 tonnes of waste was diverted from the landfill. During the year 32 tonnes of septage was tracked at the septage lagoons. There were no instances of mammalian wildlife breaching the facility fence observed during 2022 at the Hazelton Waste Management Facility and minimal vector activity from birds, including raptor species (bald eagles), and corvid species (crows and ravens). The RDKS submitted one non-compliance that covered water quality exceedances and received two temporary authorizations in 2022. Construction projects planned for 2023 include rebuilding one of the septage bays and upgrading the leachate monitoring infrastructure by installing a flow monitoring system.

Compiled by:

Kieran Griffith, Dip.Tech
Zero Waste Coordinator
Regional District of Kitimat-Stikine
kgriffith@rdks.bc.ca

Technical Review by:

Nicole Lavoie, B.Tech, A.Ag
Environmental Services Coordinator
Regional District of Kitimat-Stikine
nlavoie@rdks.bc.ca

Document Reviewed by:

Stephanie Ajah, MSc.
Solid Waste Manager
Regional District of Kitimat-Stikine
sajah@rdks.bc.ca

Document Certified by:

Robert Wickie, P.Eng
Director of Works and Services
Regional District of Kitimat-Stikine
rwickie@rdks.bc.ca



Regional District of
Kitimat-Stikine

Appendix A Operational Certificate



October 19, 2021

Tracking Number: 407972
Authorization Number: 17226

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Dear REGIONAL DISTRICT OF KITIMAT-STIKINE,

Your application for an Authorization amendment under the Environmental Management Act

In response to your letter dated October 18, 2021, and pursuant to Section 14(4) of the *Environmental Management Act*, the Director hereby consents to the following changes to Sections 11.3 and 11.4 of the Operational Certificate OC17226:

From Section 11.3:

11.3 Groundwater Monitoring

Location	Parameters	Frequency
E251512 BH-01 E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309748 SGW-3	<u>Lab:</u> Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	Quarterly → Annually ^{1,3}
E309749 SGW-4 E309750 SGW-5	<u>Field:</u> Conductivity, temperature, pH, water elevation ⁴	Monthly→Quarterly ^{1,3}

To Section 11.3:

11.3 Groundwater Monitoring

Location	Parameters	Frequency
E251512 BH-01 E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309749 SGW-4 E309750 SGW-5	<u>Lab:</u> Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	Quarterly → Annually ^{1,3}
	<u>Field:</u>	Monthly→Quarterly ^{1,3}

	Conductivity, temperature, pH, water elevation ⁴	
--	---	--

From Section 11.4:

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E309754 SW-06 E287410 SW-07 E273812 SW-08 E310968 SW-09 ¹ (property boundary)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
E310969 SW-10 (downstream of BH-03)	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

To Section 11.4:

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E287410 SW-07 E310968 SW-09 ¹ (property boundary)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

The change to Section 11.3 was made due to inaccessibility and surface water inundation.

The changes to Section 11.4 were made due to a lack to relationship of the sampling points to the landfill surface water runoff.

In addition, the following Reporting requirement is added:

Addition of Section 12.7

12.7 Site-Wide Water Balance

Complete a site-wide water balance and assessment report for surface and groundwater monitoring. The report must be submitted to the Director for review and approval by the Director by October 1, 2022.

Please note that although a revised Authorization Document has not been produced at this time a copy of this letter is being placed on the Authorization file, as an addendum to the Authorization, to formally reflect the change.

This Authorization does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This Authorization is issued pursuant to the provisions of the Environmental Management Act to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the Environmental Management Act. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Yours truly,



Karen Moores, P.Ag.
Section Head, North Authorizations, Municipal and Smelter Sectors
Environmental Protection Division
Ministry of Environment and Climate Change Strategy
email: Karen.Moores@gov.bc.ca

ENCL: None



May 27, 2020

Tracking Number: 392981
Authorization Number: 17226

REGISTERED MAIL

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Dear Operational Certificate Holder:

Enclosed is Operational Certificate 17226 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the operational certificate.

This operational certificate does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the operational certificate holder. It is also the responsibility of the operational certificate holder to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this operational certificate will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data, reports, non-compliance notifications and non-compliance reports pertinent to the permit are to be submitted to the Environmental Protection Division via email or other electronic means as directed in the following web link: <https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions>

Yours truly,

A handwritten signature in blue ink, appearing to read "Karen Moores".

Karen Moores, P.Ag.
for Director, *Environmental Management Act*

Environmental Protection
Division

Ministry of Environment

3726 Alfred Avenue
Smithers, BC, V0J 2N0

Authorizations - North
Region
Telephone: (250) 847-7260
Facsimile: (250) 847-7591

17226

page 2

Date: May 27, 2020

Authorizations - North Region

Enclosure

cc: Environment Canada



MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

17226

for the

HAZELTON REGIONAL LANDFILL

Under the Provisions of the Environmental Management Act and in accordance with the Regional District of Kitimat-Stikine's Solid Waste Management Plan, the

REGIONAL DISTRICT OF KITIMAT-STIKINE

Suite 300 – 4545 Lazelle Avenue

Terrace, British Columbia

V8G 4E1

is authorized to store, handle, treat and discharge municipal waste from Hazelton, Kitwanga and surrounding areas at the Hazelton Regional Landfill subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

1. LOCATION OF LANDFILL PROPERTY

The location of the property where discharges are authorized to occur is the SW ¼ Part of District Lot 1574, Cassiar Land District.

2. DESIGN, OPERATIONS and CLOSURE PLAN

The landfill and associated works must be designed by qualified professionals [such as engineer(s) and/or geoscientist(s)] registered in the Province of British Columbia who have expertise in the field of landfill design. These details must be incorporated into a “Design, Operations, and Closure Plan” (DOCP) which must be reviewed, updated and submitted to the Director for approval every 5 years

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)

Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

thereafter. The landfill must be operated at all times in accordance with the approved DOCP.

The DOCP must include, at a minimum:

- extent and location of each disposal area, clearly shown on a site plan;
- quantities of wastes (solid, liquid and leachate) discharged;
- works associated with each disposal area;
- any proposed restrictions on salvaging by the public;
- scaled site plan accurately showing the legal survey, the engineered final design footprint, and final design contours;
- proposed litter control measures on-site and at neighbouring properties;
- proposed measures to meet the Landfill Gas Regulation and landfill gas health and safety requirements;
- proposed surface and groundwater management plan including an assessment of the adequacy of the number and location of groundwater monitoring wells;
- proposed preliminary water quality exceedance response plans;
- proposed maximum lift height of compacted waste;
- proposed leachate system design and management plan, including the priority of and circumstances dictating when effluent is sent to the phytoremediation stand and when it is sent to the infiltration trench;
- proposed maximum allowable surface area of exposed waste;
- proposed maximum volume of waste in a cell at any given time;
- proposed method, coverage (area) and timing of progressive closure;

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- design, construction and operation of the liquid waste (septic tank pumpage) disposal lagoon(s);
- signage and fencing at and around the liquid waste disposal lagoon(s);
- nature/volume of wastes to be discharged at the liquid waste lagoon(s);
- location of the designated wood residue open burning area;
- groundwater model that, in relation to the final landfill design:
 - (i) is developed by a qualified professional (experienced in groundwater hydrogeology);
 - (ii) outlines the groundwater regime including flow directions, estimated rates, inferred leachate plume, etc. at and in the surrounding area of the landfill site influenced by landfill leachate;
 - (iii) appropriately assesses the correct number and location of wells such that groundwater can be intercepted and assessed to determine groundwater quality and flow direction;
 - (iv) estimates the loadings of Potential Contaminants of Concern (PCOC)'s from landfill leachate to the environment. The groundwater model and PCOC loading estimates must be updated with each review of the DOCP.
- maximum allowable slopes of the various disposal areas;
- engineered final design footprint delineating the maximum extent of solid waste disposal allowable at the facility horizontally and vertically;
- engineered excavation grade for municipal solid waste;
- landfill design waste density;

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- proposed notification schedule for closure;
- proposed closure plan including:
 - i) intended end-use of the landfill property after closure;
 - ii) anticipated total waste volume, tonnage, and life remaining of the landfill;
 - iii) a topographic plan showing the final elevation contours of the landfill and surface water diversion and drainage controls;
 - iv) design of the final cover suited to the intended end-use of the site, including the thickness and permeability of barrier layers and drainage layers, and information on topsoil, vegetative cover and erosion prevention controls;
 - v) procedures for notifying the public about the closure and about alternative waste disposal facilities;
 - vi) nuisance wildlife control procedures;
 - vii) a comprehensive long-term monitoring plan by a qualified professional, including groundwater monitoring, surface water monitoring, aquatic effects monitoring (including acute and chronic toxicity testing if determined to be necessary), landfill gas monitoring, leachate monitoring, final cover monitoring, and erosion and settlement monitoring, for a minimum post-closure period of 25 years;
 - viii) design, if necessary, for the collection, storage and treatment/use of landfill gas for a minimum 25-year post-closure period
 - ix) plan for the operation of any required pollution abatement engineering works such as leachate collection and treatment systems, for a minimum post-closure period of 25 years; and

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- x) an estimated cost updated every five years, to carry out closure and post-closure activities for a minimum period of 25 years.

3. DISCHARGE OF MUNICIPAL SOLID WASTE

Municipal solid waste is authorized to be discharged to ground in accordance with the approved DOCP. The site reference number for this discharge is E288569.

4. STORAGE AND HANDLING OF WASTES FOR SALVAGE AND RECYCLING

Wastes are authorized to be stored and handled for salvage and recycling in accordance with the approved DOCP.

5. DISCHARGE OF MUNICIPAL LIQUID WASTE

Municipal liquid waste is authorized to be discharged to an appropriate discharge facility in accordance with the approved DOCP. The site reference number for this discharge is E288571.

6. DISCHARGE OF TREATED EFFLUENT TO PHYTOREMEDIATION STAND

Treated effluent is authorized to be discharged to the Phytoremediation Stand in accordance with the approved DOCP and Section 9. The site reference number for this discharge is E288572.

7. DISCHARGE OF TREATED EFFLUENT TO WETLAND #4 INFILTRATION TRENCH

Treated effluent is authorized to be discharged to the Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage in accordance with the approved DOCP and Section 9. The site reference number for this discharge is E309786.

8. DISCHARGE OF AIR CONTAMINANTS FROM OPEN BURNING OF WOOD RESIDUE

Air contaminants are authorized to be released from the open burning of wood residue in accordance with this section and the approved DOCP. The site reference number for this discharge is E288570.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

8.1 Location

Any open burning of selected wastes must be restricted to the designated open burning area as shown on the attached site plan and as identified on-site. Signs which identify the nature of the waste acceptable at the designated open burning area must be erected and maintained.

8.2 Quantity, Timing, and Duration of Discharge

The maximum authorized quantity of wood residue to be open burned during each event is that which has accumulated at the time of burn initiation.

The maximum authorized duration of each burn must be limited to the period between two hours after sunrise on the day of ignition, and sunset on the following day. Each open burn must be completely extinguished at the end of the authorized burn duration.

Should a condition arise which prevents the burn pile(s) from being burned within this period, the Director must be notified in accordance with this authorization.

8.3 Nature of Wastes

Acceptable materials for burning may only include dry, unpainted, untreated demolition, construction and packing-related wood residue, clean stumps, prunings, vegetative debris and brush, but must exclude nuisance-causing combustibles such as glue-containing wood, painted and treated wood, sawdust, mulch, wood chips, rubber, plastics, tars, insulation, roofing material, asphalt shingles, etc.

8.4 Favourable Weather for Smoke Dispersion

Open burning must not proceed unless the recorded Environment Canada Ventilation Index Forecast for Smithers is greater than 55 (GOOD) for both days of the proposed burn.

The contact number for the forecast is 1-888-281-2992. Ventilation index forecasts can also be obtained after 7:00 a.m. from the following Environment Canada website:

http://www.weatheroffice.gc.ca/forecast/textforecast_e.html?Bulletin=flcn39.cw
vr

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

A burn registration number must be obtained from the Ministry of Forests (1-888-797-1717) prior to ignition.

Open burning of wood residue must not be initiated or continued if the local air flow will cause the smoke to negatively impact a nearby population or cause pollution. No burning must occur during periods of fire hazard or when burning is prohibited by other agencies.

8.5 Minimization of Smoke

Each burn must be tended in a manner that ensures minimization of smoke emissions. Measures to minimize smoke must include, but not necessarily be limited to: stacking of waste in a manner that eliminates inclusion of dirt; waiting to burn until wastes are reasonably dry after any significant precipitation event; and using adequate equipment and staff.

8.6 Extinguishment Contingency Plan

Prior to burning, a contingency plan must be in place detailing how the open burn will be extinguished in the event of any of the following occurring:

- i) Inadequate smoke dispersion in the surrounding environment;
- ii) wood continues to smoulder after the authorized burn period; and,
- ii) the Director requires that the open burn be extinguished for environmental protection reasons

8.7 Extinguishment

All combustion must be completely extinguished at the end of the authorized period as set out in Section 8.2

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

9. LEACHATE MANAGEMENT REQUIREMENTS

9.1 Leachate Management

9.1.1 Leachate Containment

A leachate containment and appropriate barrier system must be utilized. The barrier system must consist of a minimum of 2 metres of natural *in-situ* clay with a hydraulic conductivity of 1×10^{-6} cm/s or less. Alternatively, an engineered barrier may be used provided it is equivalent to or better than the natural clay barrier specified above.

9.1.2 Leachate Collection

A leachate collection system must be utilized. A continuous drainage blanket must be established beneath all landfill phases. The drainage blanket must consist of, or be equivalent to, a minimum 300 mm thick layer of clean gravel with an effective hydraulic conductivity exceeding 1×10^{-1} cm/s. The leachate collection system must be designed such that the hydraulic head on top of the barrier layer does not exceed 300 mm at any time.

9.1.3 Quantity of the Discharge

The maximum authorized quantity of discharge is indeterminate.

9.1.4 Timing of the Discharge

The discharge may occur 24 hours/day, 7 days/week, 365 days/year if in accordance with Sections 9.1.5, 11.1 and 11.2.

9.1.5 Characteristics of the Discharge

Acceptable constituents of the effluent include landfill leachate, liquid waste from the septage facility, site storm water, and run-off from the Phytoremediation Stand. The effluent must be directed in order of priority to the Phytoremediation Stand (Section 6), or to

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage (Section 7) and as established in the DOCP.

The characteristics of the effluent discharged to the Phytoremediation Stand (Section 6) or Wetland #4 Infiltration Trench within the Ephemeral Creek drainage (Section 7) must not exceed the following limits:

Daphnia magna acute lethality* ¹	50% survival in 100% concentration, Minimum
Total Nitrogen	60 mg/L
Ammonia	30 mg/L
pH	6.5 to 8.5
Chloride	3750 mg/L
Total Iron	4.5 mg/L
Total Zinc	75 mg/L
Total Cadmium	0.1 mg/L

* not applicable if discharge only occurs to the Phytoremediation Stand

¹ this limit became effective June 30 2019 to allow for commissioning of the works and an assessment of the first year of monitoring data and effectiveness to occur as required in Section 12.2(iii)

9.1.6 Site Water Balance Model and Phytoremediation Stand Uptake Review

By December 31 2023 a qualified professional must re-evaluate the site water balance model including the rate of effluent uptake by the trees in the Phytoremediation Stand. Recommendations for any alterations to the discharge requirements in this section must be submitted to the Director by June 30 2024.

9.1.7 Authorized Works

The authorized works include storm water collection infrastructure, leachate collection and treatment facilities including an equalization basin, 4 engineered wetlands, and a sand filter and

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

related appurtenances, with the final point of discharge being to either the Phytoremediation Stand or to the Wetland #4 Infiltration Trench within the Ephemeral Creek drainage approximately as shown on the attached Site Plan A. It is permissible to bypass one or more components of the authorized works in order to achieve improved effluent quality through recirculation or additional retention time. In all cases, Section 9.1.5 must be met prior to discharge.

9.1.8 Authorized Works Functionality

The operational certificate holder must not discharge under this authorization unless the authorized works are complete and fully functional according to the treatment flow options as established in the DOCP.

10. GENERAL REQUIREMENTS

10.1 Lethal Toxicity of the Discharge

Commencing July 1, 2019 (post facility commissioning period) for any discharge to the Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage (Section 7) the treated effluent and storm water must not be lethally toxic to aquatic organisms at the point of discharge (Wetland #4 Outlet Culvert) For the purposes of this 48 hour test, in >95% effluent concentration, there must be a minimum 50% survival of Daphnia magna. This Section does not apply to discharges of effluent to the Phytoremediation Stand (Section 6).

10.2 Prohibited Wastes

No wastes as defined by the Hazardous Waste Regulation (B.C. Reg. 243/2016, November 1, 2017) must be treated or disposed of at this site except as authorized by the Director. Materials which are regulated under the Recycling Regulation must not be treated or disposed of at this site if local marshalling and recycling facilities are available.

10.3 Waste Asbestos

Notwithstanding Section 10.2 of this operational certificate, the disposal of waste asbestos under Section 3 of this operational certificate and in

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

compliance with the requirements of Section 40 of the Hazardous Waste Regulation is hereby authorized.

10.4 **Contaminated Soil**

Soil that contains contaminants in concentrations less than "Hazardous Waste" as defined by the Hazardous Waste Regulation may be disposed at the landfill site. Disposal does not include use as final cover material.

10.5 **Waste Measurement**

The quantity of waste material landfilled at the site must be measured or estimated on an annual basis. This data must be made available for inspection upon request.

10.6 **Surface Water Quality Exceedances Response Plan**

The operational certificate holder must submit to the Director, a response plan detailing how the operational certificate holder will report and respond to:

- exceedances at sampling station SW-09 of the British Columbia Water Quality Guidelines for the Protection of Aquatic Life (BCWQGAL)

The response plan must be submitted a minimum of 60 days prior to the commissioning (first discharge) of the leachate treatment system. Upon completion, the response plan must also form a part of the approved DOCP.

10.7 **Surface Water Quality Assessment**

If, during monitoring under Section 11.4, surface water quality measured at the property boundary (SW-09) exceeds the BCWQGAL then the operational certificate holder must implement the Surface Water Quality Exceedances Response Plan required in Section 10.6. The Director must be notified within 24 hours of the operational certificate holder triggering the response plan required in Section 10.6.

10.8 **Ground Water Quality Exceedances Response Plan**

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

The operational certificate holder must submit to the Director, a response plan detailing how the operational certificate holder will report and respond to:

- exceedances at sampling stations SGW-2, SGW-4, SGW-5, BH-3 and BH-5B of the Contaminated Sites Regulation Schedule 6 Drinking Water Standards

The response plan must be submitted a minimum of 60 days prior to the commissioning (first discharge) of the leachate treatment system. Upon completion, the response plan must also form a part of the approved DOCP.

10.9 Ground Water Quality Assessment

If, during monitoring under Section 11.3, ground water quality measured at sampling stations SGW-2, SGW-4, SGW-5, BH-3 and BH-5B exceeds the Contaminated Sites Regulation Schedule 6 Drinking Water Standards then the operational certificate holder must implement the Ground Water Quality Exceedances Response Plan required in Section 10.8. The Director must be notified within 24 hours of the operational certificate holder triggering the response plan required in Section 10.8.

10.10 Electric Fencing

10.10.1 Design, Construction and Maintenance

Wherever required, electric fencing and gate systems at the landfill must be designed, constructed, and maintained such that bears are prevented from entering into the landfill through any portion of the fence or gates at any time of the day.

10.10.2 Fence Type

Fencing may be either high tensile smooth wire or fence fabric (e.g., mesh-wire, page-wire, chain link or the like). The configuration of a high tensile smooth wire fence must consist of a minimum of eight strands, with four energized strands alternating with four grounded strands as follows: the bottom strand must be a grounded (-) strand and must not be more than 10 cm from the earth at any location; and thence starting from the bottom strand, the other seven strands must be spaced 15 ± 2 cm, 15 ± 2 cm, 15 ± 2 cm, 20 ± 2 cm, 20 ± 2 cm, 20

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

± 2 cm, and 25 ± 2 cm. Additional strands to this minimum configuration may be used.

A fence fabric may be used instead of high tensile smooth wire. The fence fabric must: be a minimum of 1.22-metre-high; be constructed of a minimum wire thickness of 11 gauge, and have a maximum mesh size of 15 cm. The bottom of the fabric must not be more than 10 cm from the earth at any location. Any uncharged fence fabric must have a minimum of four strands of charged wires on an outrigger system, spaced as follows: the first strand must not be higher than 25 cm from the earth; and each of the remaining three strands must be spaced approximately 25 cm apart from adjacent charged strands.

10.10.3 Wire Tension

For a high tensile smooth wire fence construction, all strands must be tightened to a minimum of 125 lbs tension at 20°C. The required tension is to be corrected for temperature by use of the following formula for 12-½ gauge high tensile steel wire:

$$Tension = 125 - 2.5(Temperature - 20)$$

where: *Tension* is in lbs force

Temperature is in °C

10.10.4 Post Spacing

Fence posts must be spaced a maximum of 7.5 metres apart.

10.10.5 Grounding System

A grounding system must be installed consisting of solid grounding rods (i.e., not pipe) with a minimum diameter of 16 mm (5/8 inch) that have a buried length of at least 2 metres. A minimum of three grounding rods (spaced at least 3 metres apart) must be installed and connected to the energizer. Alternative energizer grounding systems (e.g., grounding plates, or a deep-driven grounding system) may be used provided the grounding is equivalent to or better than three grounding rods. A grounding rod (or equivalent) must be installed at least once every 450 metres along the fence and connected to the grounded wire strands or uncharged fence fabric. Additional

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

grounding may be required for dry sites or if other conditions affect proper grounding.

10.10.6 Period of Operation

Electric fencing must be fully operational during the period of April 1 to October 31 inclusive each year and at any other time of year when there is bear activity in the immediate surrounding area. If snow is present during this period, any electrified strands above the snow line must be isolated from the remainder of the system and energized.

10.10.7 Minimum Voltage

Electric fencing must be operated with a minimum voltage of 6,000 volts.

10.10.8 Gate(s)

Any access through electric fencing for vehicles, equipment and personnel must consist of an electrified gate system that is closed during non-operating hours. The gate system must always be electrified to a minimum voltage of 6,000 volts except when being opened or closed. Any gate that is open during operating hours must be periodically checked by the attendant for bear activity during hours of operation. Gaps between the gate and the fence and the earth, and between gate panels (for a double-hung gate), must not exceed 10 cm.

10.10.9 Fence Inspections

The perimeter of the electric fencing must be inspected on every day that the site is open to the public and the voltage of the fencing measured at several points and at each gate using a proper electric fence voltmeter. The results of voltage testing must be recorded in a log book. Any results less than the minimum 6,000 volts must be immediately investigated for the cause of the low voltage (e.g., low battery, litter, vegetation, loose or crossed wires, broken insulators, breaks in the grounding system, etc.). Corrective actions to restore proper voltage must be immediately undertaken.

Any discernible penetrations through electric fencing by bears and other wildlife must be immediately reported to the Conservation Officer Service at 1-877-952-7277 and to the Director at 1-250-847-7260.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

In cases of low voltage or signs of penetration attempts, inspections must be increased from once per week to once per day until proper voltage is fully restored and until there are no new signs of penetration attempts, respectively.

10.11 **Dead Animal Disposal**

Dead animals and animal parts must be disposed of in the solid waste disposal area and covered as soon as practicable with a minimum of 60 centimetres of soil and/or waste material such that flies and scavenging animals are prevented from accessing the carrion. Disposal of Specified Risk Material from cattle must only be done in accordance with Canadian Food Inspection Agency requirements and procedures.

11. **MONITORING REQUIREMENTS**

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

The operational certificate holder must carry out an environmental monitoring program for the locations specified below and as shown on Site Plan “B” as follows:

11.1 Treated Effluent to Phytoremediation Stand

Location	Parameters	Frequency
<u>Effluent:</u> E288572 Treated Leachate Post Sand Filter/Pre Phytoremediation Stand	<u>Lab:</u> total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total organic carbon, orthophosphorus, COD, BOD, pH, EPH, BTEX/VPH total Kjeldahl nitrogen <u>Field:</u> conductivity, pH, temperature, DO, turbidity, volume (flow measurement)	<u>Lab/Field:</u> Once prior to first discharge event of the year (spring) and once per summer and fall <u>Volume:</u> Continuous during discharge
<u>Soil:</u> E309686 Composite Soil Sample ¹ from Phytoremediation Stand	<u>Lab:</u> metals, salinity, nutrients, cations, ions	<u>Lab:</u> Once annually, prior to first discharge of the year, as well as baseline data collection prior to very first discharge to the phytoremediation stand soil

¹ Composite sample assembled from 4 locations from a pre-established list of 12 locations

11.2 Treated Effluent to Wetland #4 Infiltration Trench

Location	Parameters	Frequency
-----------------	-------------------	------------------

Date issued: May 30, 2013
 Date amended: May 27, 2020
 (most recent)



Karen Moores, P.Ag.
 for Director, *Environmental Management Act*
 Authorizations - North Region

<p><u>Effluent:</u></p> <p>E309786 Treated Leachate at Wetland#4 Outlet</p>	<p><u>Lab:</u> total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total organic carbon, orthophosphorus, COD, BOD, EPH, BTEX/VPH, pH, total Kjeldahl nitrogen</p> <p><u>Field:</u> conductivity, pH, temperature, DO, turbidity, volume (flow measurement), visual¹</p> <p><u>Acute Toxicity:</u> Daphnia magna</p>	<p><u>Lab/Field:</u> Once prior to first discharge event of the year (spring) and once per summer and fall. Monthly if discharging at any time during other months</p> <p><u>Volume:</u> Continuous during discharge</p> <p><u>Visual:</u> Traverse area between Wetland # 4 Infiltration Trench and SW-09 twice per week during any period of discharge to identify any surface breakouts of discharge</p> <p><u>Acute Toxicity:</u> Once prior to start of each distinct continuous discharge event, or at least once per spring, summer and fall during discharge, whichever is more frequent</p>
---	--	--

¹Visual inspection to detect surfacing of effluent between Wetland #4 Infiltration Trench and SW-09. If surface flow of effluent is detected, then the discharge must cease and the Director must be notified within 24 hours

11.3 Groundwater Monitoring

Location	Parameters	Frequency
E251512 BH-01	<u>Lab:</u>	Quarterly → Annually ^{1,3}

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309748 SGW-3 E309749 SGW-4 E309750 SGW-5	Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	
	<u>Field:</u> Conductivity, temperature, pH, water elevation ⁴	Monthly→Quarterly ^{1,3}

¹ Quarterly reduced to annually and monthly reduced to quarterly following two complete years of sampling

² Water elevation quarterly

³ Spring sampling to be conducted on or before May 15 of each year

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E309754 SW-06 E287410 SW-07 E273812 SW-08 E310968 SW-09 ¹ (property boundary) E310969 SW-10 (downstream of BH-03)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

¹ SW-09 As near to property boundary as possible but at a location where discernible flow begins in ephemeral creek drainage

² Annual sample date should be consistent year to year, and preferably taken in fall

11.5 Ground and Surface Water Monitoring Procedures

11.5.1 Sampling Procedures

The operational certificate holder must carry out sampling in accordance with the procedures described in the “British Columbia Field Sampling

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition (Permittee)” or most recent edition, or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html

11.5.2 Analytical Procedures

The operational certificate holder must carry out analyses in accordance with procedures described in the “British Columbia Laboratory Manual (2015 Permittee Edition)”, or the most recent edition or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html

11.5.3 Toxicity Sampling and Analytical Procedures

Samples must be collected from the discharge described in Section 7 and in accordance with Section 10.1 at frequencies established as per the monitoring program specified in Section 11.2 and tested for *Daphnia magna* acute lethality. *Daphnia magna* acute lethality test means the test to determine the acute lethality of effluent to *Daphnia magna* as set out in Reference Method EPS 1/RM/14.

11.5.4 Quality Assurance/Quality Control (QA/QC)

The operational certificate holder is required to conduct the following Quality Assurance and Control Program to determine the acceptability of data required by this permit and Section 2(d) of the Environmental Data Quality Assurance Regulation.

- a) Obtain and keep current, the laboratory precision, accuracy and blank quality control criteria for each laboratory analysed

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

parameter from the analytical laboratory(ies).

- b) Collect one duplicate sample during each sampling session from one of the discharge points.
- c) Each duplicate sample must be submitted to the laboratory; one of the pair identified as the regular sample, and the other, as a blind sample identified by a fictitious site-name established solely to identify the duplicate sample.
- d) For each parameter, report the results of the field duplicates in terms of the degree of variation as the relative percent difference.
- e) A sample collection blank must be prepared, containing distilled water, and preservative if required, and submitted as a blank sample with one sample set per session. If any result for any parameter indicates detectable concentrations, then efforts must be made to determine and control the source of contamination.

12 Data Analyses and Reporting

12.1 Log Book

As required by section 10.10.9 (fence inspections), the operational certificate holder must maintain a log book or electronic record. The log book or electronic record must be made available for inspection upon request by Ministry staff.

12.2 Annual Report

The operational certificate holder must collect and maintain data of effluent and soil analyses, and any other records required under this authorization for inspection when requested by Ministry staff and submit the data for the previous calendar year in a form satisfactory to the Director. The operational certificate holder must submit the annual report on or before June 30 each year for the previous calendar year.

The operational certificate holder must submit all data required to be submitted under this section by email to the Ministry's Routine Environmental Reporting Submission Mailbox (RERSM) at EnvAuthorizationsReporting@gov.bc.ca or as otherwise instructed by the

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Director. For guidelines on how to properly name the files and email subject lines or for more information visit the Ministry website:

<http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox>

The annual report must contain at minimum:

- i) The type and tonnage or volume of waste received, recycled, composted and landfilled for the year;
- ii) Volume of effluent discharged to each of the Phytoremediation Stand and Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage, with tabulation of volume and duration of each discharge event and the total volume discharged per year;
- iii) Occurrences or observations of wildlife attempting to access the facility;
- iv) The results of all required monitoring programs undertaken by the operational certificate holder for the site. Trend analysis, evaluation of any identified impacts of the discharges on the receiving environment in the previous year, and evaluation of the effectiveness of the established monitoring programs must be carried out by qualified professionals appropriate to the subject matter. Any identified recommendations must be included as they pertain to the ground water, surface water and aquatic effects (including acute toxicity) monitoring programs. Should the parameters and frequencies of the previous year's monitoring programs be identified as being not representative of receiving environment conditions, recommendations must be made for corrective actions that can be taken. Recommendations can be made to either increase or decrease parameters and frequency of any monitoring program

12.3 Non-Compliance Notification

The operational certificate holder must immediately notify the Director or designate by email at EnvironmentalCompliance@gov.bc.ca or as

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

otherwise instructed by the Director, of any non-compliance with the requirements of this authorization by the operational certificate holder and take remedial action to remedy any effects of such non-compliance. The operational certificate holder must provide to the Director with written confirmation of all such non-compliance events, including available test results, within 24 hours of the original notification, unless otherwise directed by the Director.

12.4 **Non-Compliance Reporting**

If the operational certificate holder fails to comply with any of the requirements of this authorization, the operational certificate holder must, within 30 days of such non-compliance, submit a written report that is satisfactory to the Director and includes, but is not necessarily limited to the following:

- a. all relevant test results obtained by the operational certificate holder related to the non-compliance,
- b. an explanation of the most probable cause(s) of the non-compliance, and,
- c. a description of remedial action planned and/or taken by the operational certificate holder to prevent similar non-compliances in the future.

The operational certificate holder must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox (CRSM) at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the Director. For guidelines on how to report a non-compliance or for more information visit the Ministry website:

<http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox>

12.5 **Non-compliance Reporting and Exceedances**

The operational certificate holder must cause each data submission required by this authorization to include a statement outlining the number

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

of exceedances of permitted discharges that occurred during the reporting period, the dates of each such exceedance, an explanation as to the cause of the exceedances, and a description of the measures taken by the operational certificate holder to rectify the cause of each such exceedance. If no exceedances occurred over the reporting period, the required statement may instead indicate that no exceedance of permitted discharges occurred during the reporting period.

12.6 **Toxicity Test Failure Reporting**

The operational certificate holder must report any failure of *Daphnia magna* acute toxicity tests as referenced in Sections 10.1, 11.2 and 11.5.3 to the Director within 24 hours of receiving the test failure result. As required in Section 9.1.5, beginning July 1, 2019, no discharge to the Wetland #4 Infiltration Trench may occur following a failed toxicity test unless there is a successful test result (non-failure) for *Daphnia magna* toxicity.

13. **Closure Requirements**

13.1 **Notification of Closure**

The operational certificate holder must notify the Director in writing of intentions to close the landfill site at least one year prior to closure date.

13.2 **Closure Plan**

As per Section 2 (Design, Operations and Closure Plan) closure requirements must be included in the DOCP.

13.3 **Closure Funding**

The operational certificate holder must ensure that sufficient funds will be available to provide for all closure and post-closure requirements as outlined in the closure plan required in Section 2, plus a reasonable contingency for any remediation which may be required.

13.4 **Final Cover**

The final cover system must be designed by a qualified professional to match the intended end-use of the landfill site and to match the needs of

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

any required environmental management systems (leachate minimization or recirculation, as the case may be, landfill gas collection and treatment, etc.). The final cover must consist of a layer of a minimum 600 mm of low permeability ($<1 \times 10^{-6}$ cm/s) compacted soil followed by a layer of topsoil suitable for establishment of vegetation. Use of higher permeability soil must first be approved by the Director. The final cover must be constructed with minimum and maximum slopes as specified by a qualified professional in the DOCP to promote runoff and minimize erosion, with appropriate run-on/runoff drainage controls, erosion controls, and gas venting controls. The site must be seeded with a grass/legume mixture suited to the local climate.

13.5 **Progressive Application of Final Cover**

Completed portions of the landfill must progressively receive final cover during the active life of the landfill. The maximum area of disposed refuse that has not yet received final cover must not exceed 25% of the total final footprint area. Final cover is to be applied according to the specifications identified in section 13.4.

14. **ENVIRONMENTAL IMPACT**

Inspections of the discharge will be carried out by Environmental Protection personnel as a part of the routine operational certificate inspection procedure. Based on these inspections and any other information available to the Director on the effect of the discharge on the receiving environment, the operational certificate holder may be required to undertake additional monitoring, install additional pollution control works, or change the method of operation.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

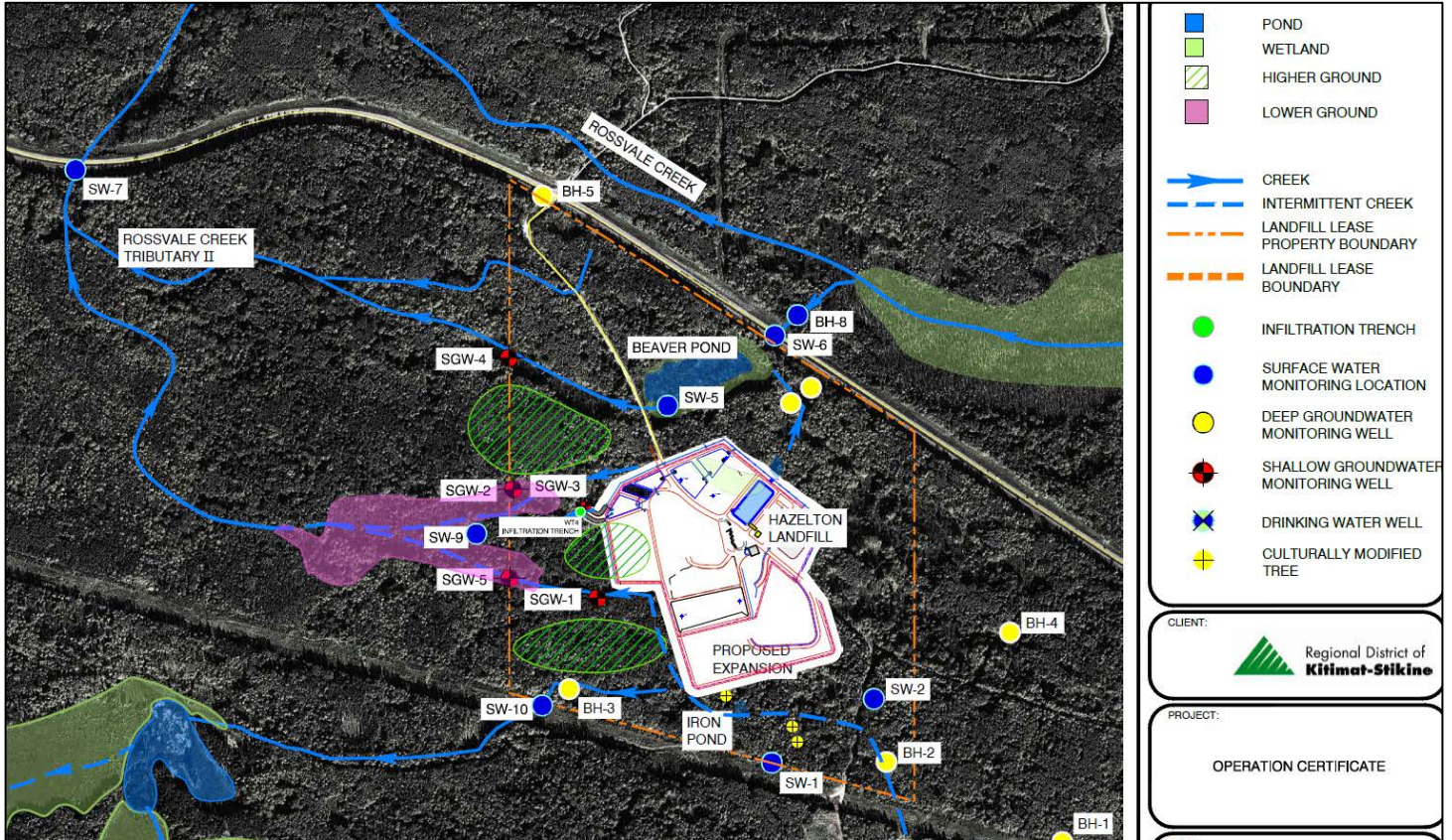
Site Plan A



Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)

Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Site Plan B



Date issued: May 30, 2013
 Date amended: May 27, 2020
 (most recent)

Karen Moores, P.Ag.
 for Director, *Environmental Management Act*
 Authorizations - North Region



Regional District of
Kitimat-Stikine

Appendix B Environmental Monitoring Report



2022 Annual Environmental Effects Monitoring Report

Hazelton Waste Management Facility

June 26, 2023

Prepared for:
Regional District of Kitimat-Stikine
Suite 300 - 4545 Lazelle Avenue
Terrace, BC V8G 4E1

Prepared by:
Stantec Consulting Ltd.
#500 - 4515 Central Blvd.
Burnaby, BC V5H 0C6

Project Number:
12322272

Limitations and Sign-off

This document entitled Annual Environmental Effects Monitoring (EEM) was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of the Regional District of Kitimat-Stikine (RDKS). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Signed on behalf of Fares Abushaban

Prepared by:

Signature

Fares Abushaban, M.Sc.A., EIT

Printed Name

Reviewed by:

Signature

Jeremiah Gladu, P.Ag., CSAP

Printed Name

Reviewed by:

Signature

Matthew Deane, P.Ag., PMP

Printed Name



Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the Regional District of Kitimat-Stikine (RDKS) to prepare the 2022 Annual Environmental Effects Monitoring (EEM) Report for the Hazelton Waste Management Facility (WMF), herein referred to as the “Site”. A Site plan is provided in Appendix A.

The EEM was completed to satisfy the conditions of Operational Certificate (OC) #17226 issued in May 2020 and amended in October 2021. A copy of the certificate is provided in Appendix B.

The objective of the EEM is to identify impacts on the receiving environment from discharges that occurred under permit at the Site in 2022 and meet the reporting requirements of the OC EEM program for the facility. The scope of work of the EEM reporting consisted of the following:

- Completing a review of analytical data from groundwater, surface water, soil, and leachate samples and compare to the following regulatory criteria:
 - Contaminated Sites Regulation (CSR) standards;
 - BC Working and Approved Water Quality Guidelines (WQGs);
 - Hazardous Waste Regulation (HWR); and
 - OC #17226 discharge characteristics.
- Evaluating impacts to the receiving environment.
- Completing a trend analysis on select geochemical parameters in groundwater to assess impacts from Site operations on the surrounding environment.
- Providing recommendations for further sampling and analysis, if any.

Data for the EEM Report was provided by RDKS and included:

- Quarterly monitoring of four groundwater wells and five standpipe piezometers;
- Annual sampling of five standpipe piezometers;
- Semi-annual sampling of five groundwater monitoring wells;
- Three surface water sampling events at five monitoring locations;
- Collection of one composite soil sample from a phytoremediation orchard;
- Three sampling events of landfill leachate; and
- Quarterly sampling of landfill leachate for acute toxicity.

Based on the information gathered and observations made during the 2022 EEM monitoring program, Stantec offers the following conclusions:

- Five groundwater wells were sampled in 2022 (BH-01 to BH-05). The reported concentrations of chloride in groundwater from BH-5B and was greater than the BC CSR Drinking Water (DW) standards. Historically, the concentration of chloride in samples from groundwater well BH-5B



appear to be elevated. This groundwater well is located near both the Yellowhead Highway and the access road to the Site, so it is possible that there may have been some of influence from road salting.

- Four standpipe piezometers were sampled in June and October 2022 (SWG-01, SWG-02, SGW-04 and SGW-05) for shallow groundwater. The following exceedances of the WQGs were identified:

Summary of Shallow Groundwater Exceedances of BC WQGs

Location	June 2022	October 2022
SGW-01	<ul style="list-style-type: none"> • dissolved aluminum 	no exceedances
SGW-02 (Down-gradient)	<ul style="list-style-type: none"> • dissolved iron • total iron 	<ul style="list-style-type: none"> • total arsenic • dissolved iron • total iron
SGW-04 (Down-gradient)	<ul style="list-style-type: none"> • dissolved cobalt • dissolved aluminum • dissolved iron • dissolved manganese • total cobalt • total mercury • total iron 	<ul style="list-style-type: none"> • dissolved cobalt • dissolved manganese • dissolved iron • total cobalt • total manganese • total mercury • toluene • total iron • total arsenic • total beryllium
SGW-05	<ul style="list-style-type: none"> • dissolved cobalt • dissolved iron 	<ul style="list-style-type: none"> • dissolved cobalt • dissolved iron • total cobalt • total lead • total mercury • total zinc • total iron • total manganese • total arsenic • total beryllium

- These exceedances are likely attributable to natural concentrations in porewater; however, a more detailed study would be required to make this determination.
- Five surface water locations were sampled in May, June, August, and/or October 2022 (SW-01, SW-02, SW-05, SW-07 and SW-09). The following exceedances of the WQGs were identified:



Summary of Shallow Ground Water Exceedances of BC WQGs

Location	May 2022	June 2022	August 2022	October 2022
SW-01	<ul style="list-style-type: none"> dissolved aluminum 		<ul style="list-style-type: none"> total cobalt total manganese total zinc dissolved aluminum total arsenic total iron dissolved iron total silver 	<ul style="list-style-type: none"> dissolved aluminum toluene alkalinity total iron dissolved iron
SW-02	<ul style="list-style-type: none"> dissolved aluminum 		<ul style="list-style-type: none"> dissolved iron total iron 	<ul style="list-style-type: none"> dissolved iron toluene total zinc ammonia total arsenic total iron
SW-05	<ul style="list-style-type: none"> dissolved aluminum alkalinity 		<ul style="list-style-type: none"> dissolved aluminum dissolved iron total iron 	<ul style="list-style-type: none"> dissolved iron
SW-07 (sampled in June only)		<ul style="list-style-type: none"> dissolved aluminum 		

- These exceedances are likely attributable to natural concentrations in surface water; however, a more detailed study would be required to make that determination.
- Two leachate locations (from Wetland 4 and sand filter locations) were sampled in January and March 2022; Wetland 4 was also sampled in August 2022. The reported concentrations of analysed parameters in the leachate samples were less than the applicable OC criteria except for the following:
 - The reported concentration of iron in the leachate sample collected from the sand filter in March 2022 was greater than the OC permit criteria.
 - The reported concentration for iron in the leachate sample collected from the weir of Wetland 4 in August 2022 was greater than the OC permit criteria.
- One composite soil sample was collected from the phytoremediation area in March 2022. The reported concentrations of total arsenic exceeded the applicable BC CSR Industrial Land (IL) use standard for soils. The reported soil concentrations for the remaining analyzed parameters were less than the CSR IL standards.

Based on the analytical results and observations made during the 2022 monitoring program, Stantec recommends the following:



2022 Annual Environmental Effects Monitoring Report
Executive Summary
June 26, 2023

- The current monitoring program should be continued in 2023 in accordance with the requirements under the OC.
- A soil sample should be collected offsite from the phytoremediation orchard location to assess whether the elevated arsenic not in the 2022 EEM program is naturally occurring in the native soil.
- Surface water samples should be collected in areas hydraulically upgradient from the Site to provide a better data set on of the background concentrations present in the area.

The statements made in this Executive Summary are subject to the same limitations included in the Limitations of this Report (Section11) and are to be read in conjunction with the remainder of this report.



Table of Contents

Limitations and Sign-off	i
Executive Summary	ii
Acronyms / Abbreviations	1
1 Introduction	2
1.1 Objective and Scope of Work	2
2 Background	3
2.1 Site Description	3
2.2 Previous Environmental Reports	3
2.2.1 Non-Compliance Reporting	4
2.2.2 Historical Data Tables	4
3 Regulatory Framework	5
3.1 Groundwater Standards	5
3.2 Soil Standards	5
3.3 Surface Water Quality Guidelines and Standards	6
3.4 Operational Certificate # 17226	6
3.5 Hazardous Waste Regulation	7
4 Environmental Effects Monitoring Program	8
4.1 Groundwater	8
4.2 Surface Water	10
4.3 Leachate	11
4.4 Phytoremediation Orchard Area	13
5 Quality Assurance/Quality Control Program	14
6 Summary of Results	16
6.1 Groundwater	16
6.1.1 Monitoring.....	16
6.1.2 Analysis	16
6.2 Surface Water	18
6.2.1 Monitoring.....	18
6.2.2 Analysis	19
6.3 Facility	19
6.3.1 Leachate Monitoring.....	19
6.3.2 Leachate Analysis	19
6.4 Composite Soil	20
6.5 Toxicity Data	20
7 QA/QC Summary	21
7.1.1 Laboratory QA/QC.....	21
8 Trend Analysis	26
9 Conclusion and Recommendations	27
10 Limitations	30
11 References	32
List of Tables	
Table 3-1 Operational Certificate # 17226 Leachate Discharge Criteria.....	7



2022 Annual Environmental Effects Monitoring Report

Table of Contents

June 26, 2023

Table 4-1	Groundwater Monitoring Locations and Parameters.....	9
Table 4-2	Historical Groundwater Monitoring Locations	10
Table 4-3	Surface Water Sample Locations and Parameter	10
Table 4-4	Historical Surface Water Monitoring Locations	11
Table 4-5:	Treated Leachate Monitoring and Sampling Parameters and Frequency	11
Table 4-6	Historical Leachate Monitoring Locations.....	12
Table 4-7	Phytoremediation Orchard Area Sampling Requirements	13
Table 5-1	Sample and Blind Field Duplicate Summary	14
Table 5-2	Recommended RPD Targets	15
Table 6-1	Shallow Standpipes Analytical Results Exceedances Summary	17
Table 6-2:	Discharge Data.....	18
Table 6-3:	Surface Water Analytical Results Exceedances Summary.....	19
Table 9-1:	Summary of Shallow Groundwater Exceedances of BC WQGs.....	27
Table 9-2:	Summary of Surface Water Exceedances of BC WQGs	28

List of Appendices

Appendix A	Site Plan
Appendix B	Operational Certificate
Appendix C	Non-Compliance Report
Appendix D	Historical Data Tables
Appendix E	Photographs
Appendix F	Data Summary Tables
Appendix G	Laboratory Analytical Certificates
Appendix H	Trend Analysis



Acronyms / Abbreviations

AW	Aquatic Life
BC	British Columbia
BC ENV	BC Ministry of Environment and Climate Change Strategy
BC WQG	BC Water Quality Guidelines
BFD	Blind Field Duplicate
BOD	Biological Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CALA	Canadian Association for Laboratory Accreditation
COD	Chemical Oxygen Demand
CSR	Contaminated Sites Regulation
DW	Drinking water
ENV	British Columbia Ministry of Environment and Climate Change
EPH	Extractable Petroleum Hydrocarbons
FW	Freshwater
IL	Industrial Land Use Standards
m	Metre
masl	Metres above sea level
mbg	Metres below ground surface
NAPL	Non-aqueous phase liquid
OC	Operational Certificate
PAH	Polycyclic aromatic hydrocarbon
PCOC	Potential contaminant of concern
QA/QC	Quality Control and Quality Assurance
RPD	Relative Percent Difference
TOC	Total Organic Carbon
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbon
WMF	Waste Management Facility



1 Introduction

Stantec Consulting Ltd. (Stantec) was retained by the Regional District of Kitimat-Stikine (RDKS) to prepare the 2022 Annual Environmental Effects Monitoring (EEM) Report for the Hazelton Waste Management Facility (WMF), herein referred to as the “Site”. A Site plan is provided in Appendix A.

The EEM was completed to satisfy the conditions of Operational Certificate (OC) #17226 issued in May 2020 and amended in October 2021. A copy of the certificate is provided in Appendix B.

1.1 Objective and Scope of Work

The objective of the EEM is to identify impacts on the receiving environment from discharges that occurred under permit at the Site in 2022 and meet the reporting requirements of the OC EEM program for the facility. The scope of work of the EEM reporting consisted of the following:

- Complete a review of analytical data from groundwater, surface water, soil and leachate samples and compare to the following regulatory criteria:
 - Contaminated Sites Regulation (CSR) standards;
 - BC Working and Approved Water Quality Guidelines (WQGs);
 - Hazardous Waste Regulation (HWR); and
 - OC #17226 discharge characteristics.
- Evaluate impacts to the receiving environment.
- Complete a trend analysis on select geochemical parameters in groundwater to assess impacts from Site operations on the surrounding environment.
- Provide recommendations for further sampling and analysis, if any.

Data for the EEM Report was provided by RDKS and included:

- Quarterly monitoring of four groundwater wells and five standpipe piezometers;
- Annual sampling of five standpipe piezometers;
- Semi-annual sampling of five groundwater monitoring wells;
- Three surface water sampling events at five monitoring locations;
- Collection of one composite soil sample from a phytoremediation orchard;
- Four sampling events of landfill leachate; and
- Quarterly sampling of landfill leachate for acute toxicity.



2 Background

The following sections provides a description of the Site and a summary of relevant environmental reports and inspections previously completed for the Site.

2.1 Site Description

The following maps and reports were reviewed to identify the topographic, geologic, and hydrologic setting of the Site:

- GeoBC's web-based mapping tool iMapBC (accessed April 2023)
- The Surficial Geology Map of the Skeena River and Bulkley River Area (Clague 1983)
- Google Earth (accessed April 2023)

The Site is located south of the Yellowhead Highway, with Hagwilet Peak to the southwest and the Bulkley River to the north. The terrain is mostly level, sloping slightly downwards the northwest, and is comprised of glacial till made up of dense, silty sand with some gravel.

The Site contains a WMF that manages both solid and liquid waste. The leachate from the Site is collected in an equalization pond and treated through several engineered wetlands (Wetlands #1, #2, and #3). The treated effluent is then discharged to a phytoremediation treatment area, with runoff from this area collected by Wetland #4.

The surface water runoff is guided by a perimeter ditch system towards the northwest to a wetland area and northwards to a beaver pond. The water from the wetlands flows into Rossvale Creek Tributary II, which leads to the Bulkley River.

2.2 Previous Environmental Reports

Previous studies and annual monitoring reporting of the Site have been completed by Sperling Hansen Associates (SHA). Annual EEM reports have been prepared for the Site during the period of 2017 to 2021.

Stantec has reviewed the 2020 report titled "*Hazelton Waste Management Facility 2020 Annual Monitoring Report*", (SHA 2020), dated June 2021 and the 2021 EEM report titled "*Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report*", WSP Golder (WSP), dated June 2022.

The 2021 EEM report provided the following conclusions:

- Elevated chloride was identified in shallow groundwater at monitoring well BH-5B and surface water monitoring locations SW-5 and SW-9, which might be partially attributed to the WMF source (i.e., the Site).



- Groundwater and surface water monitoring results in the other locations reportedly had no exceedances that would suggest an impact to the receiving environment from the Site.
- The results of standpipe monitoring undertaken in ephemeral streams and wetlands (SGW-1 to SGW-5) were reportedly to be interpreted with caution. The sample results were potentially not an accurate representation of shallow groundwater originating from the Site due to the stagnant nature of the water in these installations.

WSP recommended the following for future work at the Site:

- Groundwater sampling from the shallow standpipe series (SGW-1 to SGW-5) should be stopped since the water collected from these installations in ephemeral streams and wetlands might not be an accurate representation of the shallow groundwater coming from the Site.
- WSP recommended the addition of dissolved organic carbon analysis to the surface water monitoring program.
- WSP recommended to optimize the monitoring well network by reducing the upgradient monitoring program to one deep (BH-4A) and one shallow (BH-4B) monitoring well, retaining monitoring of the cross-gradient monitoring well (BH-03), and adding two additional conventional shallow monitoring wells to the downgradient monitoring program.

2.2.1 Non-Compliance Reporting

The RDKS submitted a Non-Compliance Report (NCR) for the Hazelton WMF in November 2022, summarizing exceedances in soil and water and another NCR in December 2022, summarizing exceedances in surface water. Copies of the NCRs are provided in Appendix C.

2.2.2 Historical Data Tables

Historical data tables have been provided by RDKS and are included as Appendix D. The data tables contain historical results for previous groundwater and surface water sampling, leachate sampling and soil sampling in the phytoremediation area. These data tables are presented as received and the standards, guidelines and criteria within these tables have not been modified or updated. These tables are included for the purposes of maintaining a record of historical data for the Site.



3 Regulatory Framework

Contaminated sites in BC are governed by the *Environmental Management Act* (the Act) and administered by the BC ENV. The *Contaminated Sites Regulation* (CSR) is the enabling regulation under the Act that outlines procedures for the investigation and reporting of contaminated sites and includes numerical standards for soil and groundwater quality for specific land and water uses.

The applicable soil, groundwater, and surface water standards and/or guidelines are summarized below.

3.1 Groundwater Standards

Groundwater outside of the landfill and leachate collection areas is regulated under the BC CSR. The CSR includes generic numerical standards for groundwater quality for specific water uses (i.e., aquatic life, irrigation, livestock, and drinking water).

Per the BC ENV *Protocol 21 (P21): Water Use Determination* (BC ENV, 2017), site-specific factors are used to determine if CSR standards protective of drinking water (DW) apply at the Site, with current and future uses evaluated separately. Based on section 3.2 of Protocol 21, the drinking water standards applies regardless of whether drinking water wells currently exist near the Site to protect aquifers that could support future drinking water wells. Therefore, the DW standards for groundwater are considered applicable to the Site based on the potential for future drinking water use.

An aquatic habitat survey has not been completed for the Site. A search of the BC Water Atlas through iMap BC (accessed April 2023) indicated there are unnamed tributaries to Bulkley River and several wetlands located within 500 m of the Site. Therefore, the CSR freshwater aquatic life (AW_{FW}) standards are considered applicable to the Site.

Water at and within 500 m of the Site, is not currently used for irrigation or livestock watering, and the Site is not located on Agricultural Land Reserve (ALR) land. Therefore, irrigation (IW) and livestock watering (LW) standards and guidelines were not considered applicable at the Site.

Based upon the historical and current uses of the Site (i.e., waste management facility), the groundwater standards for dissolved iron and manganese were not considered applicable at the Site.

In summary the CSR DW and AW_{FW} standards are applicable to the groundwater at the Site.

3.2 Soil Standards

Waste received and discharged at the Site is managed under OC #17226. Soil at the Site is regulated under the BC CSR. Generic numerical soil standards are presented in CSR Schedule 3.1. Soil standards are divided into matrix numerical standards (Schedule 3.1 Part 1) and generic numerical standards (Schedule 3.1 Parts 2 and 3). Standards protective of the following uses are provided for both the matrix



and generic standards: wildlands (natural or reverted), agricultural, urban park, residential (low or high density), commercial and industrial. Based on the Site land use, the CSR industrial land use (IL) standards are considered applicable to the Site. Matrix standard site-specific factors that were applied based on exposure pathways include:

- intake of contaminated soil (applies to all sites)
- toxicity to soil invertebrates and plants (applies to all sites)
- groundwater used for drinking water (to protect future water use)
- groundwater flow to surface water used by freshwater aquatic life

As per Section 11(3) of the BC CSR, a site is not a contaminated site if soil concentrations do not exceed local background concentrations. Regional estimates for background concentrations for soil are provided in Table 1 of BC ENV Protocol 4 (P4) for the Skeena Region (BC ENV 2021).

3.3 Surface Water Quality Guidelines and Standards

For the assessment of surface water quality within a freshwater waterbody, the BC ENV WQGs, both approved and working, are considered applicable. A search of the BC Water Atlas through iMap BC (accessed March 25, 2023) indicates that registered surface water intakes (points of diversion are not located within 500 m of the Site. The Site is currently surrounded by Crown land. Residential buildings have not been identified within 1 km of the Site. Based on this information, it is not anticipated that surface water within 1 km of the Site is used for drinking water on a permanent basis.

Due to the presence of an unnamed tributary to Bulkley River, and several wetlands located within 500 m of the Site, BC WQGs for AW_{FW} are considered applicable to the Site. The shallow standpipe piezometers are installed in ephemeral creeks and wetlands; therefore, the BC WQGs for AW_{FW} are also considered applicable to the water quality of the shallow standpipes.

3.4 Operational Certificate # 17226

The certificate has criteria for the discharge of landfill leachate to the phytoremediation orchard area and Wetland 4 outlet. The treated leachate discharged to Wetland 4 outlet must not be lethally toxic to aquatic organisms, such that in a 48-hour toxicity test in >95% effluent concentration, there must be a minimum 50% survival of *Daphnia magna*.



Table 3-1 Operational Certificate # 17226 Leachate Discharge Criteria

Parameter	Discharge Limit
pH	6.5 – 8.5
Total Ammonia	30 mg/L
Chloride	3750 mg/L
Total Nitrogen as N	60 mg/L
Total Iron	4.5 mg/L
Total Cadmium	0.1 mg/L
Total Zinc	75 mg/L

3.5 Hazardous Waste Regulation

The HWR outlines siting standards for facilities that receive hazardous waste for treatment, storage, or disposal. Additionally, the HWR details operational and management requirements for facilities or businesses that generate, transport, or receive hazardous waste. Hazardous waste is generally defined as a dangerous good under the Federal Transportation of Dangerous Goods Act that no longer is suitable for their intended purpose. Hazardous waste can also include, but not limited to waste containing polychlorinated biphenyls (PCBs), pesticides or residues, biomedical waste, oil, asbestos, polycyclic aromatic hydrocarbons (PAHs), leachable toxic waste and waste streams prescribed in Schedule 7 of the HWR.

Under the OC #17226, the Site is not permitted to receive nor discharge hazardous waste with the exception of waste asbestos. As per Section 10.3 of OC #17226, receipt of waste asbestos is authorized.



4 Environmental Effects Monitoring Program

Sampling and monitoring for the 2022 EEM field program was completed by RDKS Environmental Technicians and overseen by the RDKS Environmental Services Coordinator. Soil, surface water, groundwater and leachate samples were collected by RDKS field staff using procedures outlined in the BC Field Sampling Manual (BCFSM) Part D – Solids and Part E – Water and Wastewater Sampling. Field QA/QC procedures followed the BCFSM Part A – Quality Control and Quality Assurance.

Methodologies, field observations and well monitoring data documented from the field program are presented and discussed in the following sub-sections. Site photographs collected during the field investigation are presented in Appendix E.

A summary of the monitoring locations outlined in OC # 17226 is discussed in the following sections. A summary of the monitoring locations outlined in OC #17226 is also discussed in the following sub-sections.

4.1 Groundwater

Groundwater was sampled from the existing monitoring wells in October 12 and 18, 2022. Observations made during the groundwater monitoring program are summarized in Table 1 included in Appendix F.

The groundwater wells were monitored for water elevation, specific conductivity, and water temperature. Groundwater elevations, conductivity and temperature were measured using a Solinst TLC tape and the probe was cleansed with a mixture of Alconox® and water prior to each measurement to prevent cross-contamination from well to well.

Groundwater purging and sample collection was performed with the use of a tubing actuator, the Waterra Hydrolift. Prior to sampling, the monitoring wells were purged while monitoring the pH, conductivity, and temperature of the groundwater using a YSI water quality meter that was calibrated before each event following manufacture's instructions. Water was removed (purged) from each well (up to three well casing volumes), until the monitored parameters stabilized. The samples were stored in ice-chilled coolers prior to delivery to ALS Laboratories (ALS) in Burnaby, BC for analysis under chain of custody protocol. ALS is accredited by the Canadian Association for Laboratory Accreditation (CALA).

Hydrocarbon-like odours or sheens were not observed in groundwater recovered from the monitoring wells.

Groundwater monitoring of geophysical parameters was completed using a YSI water quality meter that was calibrated before each event following the manufacturer's instructions. Samples were collected in clean, laboratory-supplied sample bottles, and transported to an accredited laboratory for analyses.

A summary of the groundwater monitoring and sampling locations, parameters and frequency of analysis required by OC #17226 is provided in Table 4-1 below.



Table 4-1 Groundwater Monitoring Locations and Parameters

Sample Type	Monitoring Location	OC Station ID	Parameters/Frequency	Easting UTM ¹	Northing UTM ¹
Groundwater	BH-01	E251512	<p style="text-align: center;"><u>Annually</u> ²</p> <p>Laboratory - dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH</p> <p style="text-align: center;"><u>Quarterly</u> ²</p> <p>Field – static water levels, conductivity, temperature</p>	593625	6121809
	BH-02	E251513		593246	6121899
	BH-03	E251514		592642	6122035
	BH-4B ³	E252313		593489	6122142
	BH-5B	E252314		592575	6122994
	BH-4A ³	NS		593489	6122142
Shallow Standpipe	SGW-1	E309746	<p style="text-align: center;"><u>Semi-Annually</u> ²</p> <p>Laboratory - dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH</p> <p style="text-align: center;"><u>Quarterly</u> ²</p> <p>Field – static water levels, conductivity, temperature</p>	592667	6122255
	SGW-2	E309747		592577	6122445
	SGW-4	E309749		592535	6122699
	SGW-5	E309750		592524	6122323

Notes:

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

² Frequency reduced after two complete years of sampling.

³ BH-4A was sampled instead of BH-4B as it was completely dry in October 2022. Both wells were monitored quarterly.

Where:

TOC = Total Organic Carbon

COD = Chemical Oxygen Demand

VOCs = Volatile Organic Compounds

EPH= Extractable Petroleum Hydrocarbons

BTEX=Benzene, Toluene, Ethylbenzene, Xylene

VPH= Volatile Petroleum Hydrocarbon

NS = Not Stated in the OC

Groundwater was historically collected at two locations as shown in Table 4-2 below. These groundwater locations have been removed from the EEM program per the amended OC.



Table 4-2 Historical Groundwater Monitoring Locations

MonitoringLocation	Easting UTM ¹	Northing UTM ¹
BH-5A	592575	6122994
SGW-3	592673	6122409

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

4.2 Surface Water

Surface water samples were collected from five monitoring locations (SW-01, SW-02, SW-05, SW-07 and SW-09) three times in 2022. Observations made during the surface water monitoring program are summarized in Table 2 in Appendix F. Hydrocarbon-like sheen and/or odours were not observed during sampling. Surface water samples were stored in ice-chilled coolers prior to delivery to ALS in Burnaby, BC for analysis under chain of custody protocol.

A summary of the surface water monitoring and sampling locations, and the parameters and frequency of analysis required by OC #17226, is provided in Table 4-3 below.

Table 4-3 Surface Water Sample Locations and Parameter

MonitoringLocation	OC Station ID	Parameters/Frequency	Easting UTM ¹	Northing UTM ¹
SW-01 (Upstream of Site)	E309751	<p>Seasonally ²</p> <p>Laboratory – total metals, dissolved metals, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, COD, BOD, pH, total Kjeldahl nitrogen, TOC, EPH, BTEX/VPH</p> <p>Seasonally ²</p> <p>Field – conductivity, temperature, turbidity, water level, flow rate, dissolved oxygen</p>	593026	6121890
SW-02 (Upstream of Site)	E309752		593226	6122015
SW-05 (Beaver pond outlet / Down-stream)	E287409		592822	6122589
SW-07 ³ (Rossvale Creek / Down-stream)	E287410		591670	6213024
SW-09 (ephemeral creek west of Site / Down-stream)	E310968		592531	6122439

Notes:

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

² Frequency reduced after two complete years of sampling. Once sampling on an annual basis begins, sampling is to be completed during the season with the lowest stream flow.



³ The surface water at location SW-07 was completely dry during August and October 2022; therefore, it was monitored and sampled only once in June 2022.

Where:

BOD = Biological Oxygen Demand

COD = Chemical Oxygen Demand

TOC = Total Organic Carbon

EPH= Extractable Petroleum Hydrocarbons

BTEX= Benzene, Toluene, Ethylbenzene, Xylene

VPH= Volatile Petroleum Hydrocarbon

Surface water was historically collected at three locations as show in Table 4-4 below. These surface water locations have been removed from the EEM program per the amended OC.

Table 4-4 Historical Surface Water Monitoring Locations

Monitoring Location	Easting UTM ¹	Northing UTM ¹
SW-06	593046	6122745
SW-08	593090	6122786
SW-10	592631	6122000

¹ Coordinates obtained from the Hazelton Ridge Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

4.3 Leachate

Leachate samples are collected from the sand filter manhole and from the weir of the Wetland 4 outlet. Observations made during the leachate monitoring program are summarized in Table 3 included in Appendix F. Table 4-5 below summarizes frequency and sampling and monitoring requirements of the treated leachate outlined in OC# 17226.

Table 4-5: Treated Leachate Monitoring and Sampling Parameters and Frequency

Location	OC Station ID	Parameters/Frequency	Easting UTM ¹	Northing UTM ¹
Treated Leachate Post Sand Filter/ Pre-Phytoremediation Stand (Effluent)	E288572	<p>Seasonally ² Laboratory – total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, TOC, orthophosphorus, COD, pH, EPH, BTEX/VPH, total Kjeldahl nitrogen</p> <p>Seasonally ² Field –conductivity, pH temperature, DO and turbidity, volume (flow measurement)</p>	592809	6122452



2022 Annual Environmental Effects Monitoring Report
4 Environmental Effects Monitoring Program
 June 26, 2023

Location	OC Station ID	Parameters/Frequency	Easting UTM ¹	Northing UTM ¹
Treated Leachate at Wetland #4 outlet (effluent)	E309786	<p>Seasonally ² Laboratory – total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, TOC, orthophosphorus, COD, pH, EPH, BTEX/VPH, total Kjeldahl nitrogen</p> <p>Seasonally ² Field –conductivity, pH temperature, DO and turbidity, volume (flow measurement)</p> <p>Seasonally ² Acute Toxicity- Daphnia magna</p>	592715	6122425

Notes:

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

² Lab/Field: Once prior to first discharge event of the year (spring) and once per summer and fall.

Where:

TOC = Total Organic Carbon

COD = Chemical Oxygen Demand

VOCs = Volatile Organic Compounds

DO = Dissolved Oxygen

EPH= Extractable Petroleum Hydrocarbons

BTEX=Benzene, Toluene, Ethylbenzene, Xylene

VPH= Volatile Petroleum Hydrocarbon

Leachates was historically collected at three locations as show in Table 4-6 below. These leachate sample locations have been removed from the EEM program as per the amended OC.

Table 4-6 Historical Leachate Monitoring Locations

MonitoringLocation	Easting UTM ¹	Northing UTM ¹
Wetland 1	592974	6122515
Wetland 2	592866	6122495
Wetland 3	592824	6122456

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.



4.4 Phytoremediation Orchard Area

One composite soil sample is required by OC #17226 to be collected from the phytoremediation orchard area annually. A summary of the sampling requirements is presented in Table 4-7 below.

Table 4-7 Phytoremediation Orchard Area Sampling Requirements

Location	OC Station ID	Parameters/Frequency	Easting UTM ¹	Northing UTM ¹
Composite Soil sample from Phytoremediation Area	E309686	<u>Annually</u> ² Laboratory – metals, salinity	531146	6018102

Notes:

¹ Coordinates obtained from the Hazelton Waste Management Facility 2021 Annual Environmental Effects Monitoring Report, WSP Golder, June 2022. Coordinates are reported to be approximate.

² Sampling completed prior to discharge each season. Lab: Once annually, prior to first discharge of the year, as well as baseline data collection prior to very first discharge to the phytoremediation stand soil.



5 Quality Assurance/Quality Control Program

A field duplicate sample is a split of a homogenized soil, groundwater, or surface water sample that is prepared and analyzed following the same procedure as the original sample. The relative percent different (RPD) is calculated for the results of the pair of samples. The RPD for two data points is equal to the difference divided by the mean multiplied by 100 percent, as shown below. The RPD is used to evaluate the precision of the laboratory analysis.

$$\left(\frac{|X_i - X_{ii}|}{\bar{X}} \right) \times 100 \%$$

NOTES:

- X_i Concentration in Original Sample
- X_{ii} Concentration in Duplicate Sample
- \bar{X} Mean of Sample Concentrations

Throughout the investigation, blind field duplicates (BFDs) were collected during sampling events. These BFDs were collected at the same location, at the same time, by the same person utilizing the same equipment during field activities. The BC ENV suggests that BFDs should be collected at a rate of 10% of the total primary samples collected, and the following Table 5-1 summarizes the percent of BFDs obtained for soil and groundwater.

Table 5-1 Sample and Blind Field Duplicate Summary

Sampled Media	Number of Samples	Number of BFDs	Percentage of BFDs	Total Samples Collected
Groundwater	5	0	0	5
Standpipes Groundwater	7	0	0	7
Surface Water	13	4	23.5	17
Leachate	10	2	16.67	12

Once RPD values were calculated for analytical results of original and field duplicate samples, RPD values were compared to recommended BC ENV RPD targets, categorized by analytical parameter. These RPD targets are presented in Table 5-2 below and were obtained from Q.#36 of the Q&A section (Category: Standards, Sub-Category: General) on the BC ENV Land Remediation website. The BC ENV recommends that the RPD for duplicate field samples not exceed 1.5 times the acceptable lab RPD for the same compound. The lab RPDs can be found in the BC Environmental Laboratory Manual¹.

¹ BC ENV, 2016. British Columbia Environmental Laboratory Manual, 2015 Edition.



Table 5-2 Recommended RPD Targets

Parameter Category	Recommended RPD
Organics in Soil	
Polycyclic Aromatic Hydrocarbons (PAH)	75%
Volatile organics (including F1, BTEX and VH)	60%
F2-F4 (Similar to Extractable Petroleum Hydrocarbons (EPH))	60%
Most Other Typical Organic Parameters	60%
Organics in Water	
Volatile Organics (including F1, BTEX and VH)	45%
Most other Typical Organic Parameters	45%
Others	
High variability metals in soil: Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti	60%
Other metals in soil and sediment	45%
Metals in Water	30%
General Inorganics in Soil and Sediment	45%
General Inorganics in Water	30%



6 Summary of Results

A summary of the results of the groundwater, surface water, leachate, and phytoremediation soil sampling are provided in the following sections.

6.1 Groundwater

6.1.1 Monitoring

Monitoring of the wells and shallow standpipes was completed quarterly in 2022. Water levels were measured with a Solinst TLC depth tape. Depth to groundwater reportedly ranged between 391.7 meters above sea level (masl) in monitoring well BH-03 to 431.5 masl in monitoring well BH-05B.

Based on the groundwater monitoring results from the August 2022 monitoring event, the inferred groundwater flow direction was generally to the northwest. Previous work by SHA estimated a low permeability of the till underlying the Site which suggests that the groundwater flow through the till material is limited. The groundwater flow direction in the August 2022 monitoring event indicates groundwater flow towards monitoring well BH-5A which is located downgradient of the Site, while BH01, BH-02 and BH-04A are upgradient of the Site.

Shallow subsurface groundwater was encountered in monitoring wells BH-04B, BH05B and all the standpipes. The inferred shallow groundwater direction was towards the northwest, consistent with the general site topography. Based on this flow direction, BH-04B is located upgradient of the Site, while SGW-5 is located downgradient. Standpipes SGW-01, SGW-02, SGW-04 and SGW-05 were installed in ephemeral streams and wetlands located downgradient of the Site where groundwater was encountered at depths ranging from 1 m to 1.5 mbgs.

Groundwater well and shallow standpipe monitoring data are summarized in Table 1 in Appendix F.

6.1.2 Analysis

Five groundwater samples were collected in October 2022 and submitted for laboratory analysis of the parameters listed in Section 4.1. The reported concentrations of analysed parameters in the five groundwater samples were less than the applicable CSR AW_{FW} and DW standards except at groundwater well BH-5B where the reported concentration of chloride was greater than the BC CSR DW standards.

Four shallow groundwater samples were collected from the standpipe piezometers in June and October 2022. The following exceedances in Table 6-1 were reported:



Table 6-1 Shallow Standpipes Analytical Results Exceedances Summary

Sample Location	BC CSR AWF _{FW}	BC CSR DW Exceedances	BC WQG AW Chronic	BC WQG AW Acute	BC WQG Working
SGW-01 (Down-gradient)	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> Dissolved Aluminum (June 2022) 	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> No Exceedances
SGW-02 (Down-gradient)	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> Total Arsenic (October 2022) Dissolved Iron (June/October 2022) Total Iron (June/October 2022) 	<ul style="list-style-type: none"> No Exceedances
SGW-04 (Down-gradient)	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> Dissolved Cobalt (June/October 2022) Dissolved Manganese (October 2022) 	<ul style="list-style-type: none"> Dissolved Aluminum (June 2022) Dissolved Iron (June/October 2022) Total Cobalt (June/October 2022) Total Manganese (October 2022) Total Mercury (June/October 2022) Toluene (Oct) 	<ul style="list-style-type: none"> Total Iron (June/October 2022) Total Arsenic (October 2022) 	<ul style="list-style-type: none"> Total Beryllium (October 2022)
SGW-05 (Down-gradient)	<ul style="list-style-type: none"> No Exceedances 	<ul style="list-style-type: none"> Dissolved Cobalt (June/October 2022) 	<ul style="list-style-type: none"> Dissolved Iron (June/October 2022) Total Cobalt (October 2022) Total Lead (October 2022) Total Mercury (October 2022) 	<ul style="list-style-type: none"> Total Iron (October 2022) Total Manganese (October 2022) Total Arsenic (October 2022) 	<ul style="list-style-type: none"> Total Beryllium (October 2022)



Sample Location	BC CSR AWF _W	BC CSR DW Exceedances	BC WQG AW Chronic	BC WQG AW Acute	BC WQG Working
			<ul style="list-style-type: none"> Total Zinc (October 2022) Total Manganese (October 2022) 		

The groundwater and standpipe analytical results for the 2022 EEM program are summarized in Tables 4 and 5 in Appendix F. Laboratory analytical certificates are provided in Appendix G.

6.2 Surface Water

6.2.1 Monitoring

Surface water at five locations were monitored quarterly in 2022. Surface water monitoring data are presented in Table 2 in Appendix F.

Calculated discharges are presented in Table 6-2 below.

Table 6-2: Discharge Data

Date	Discharge (m ³ /s)
SW-05¹	
17 May 2022	0.006
5 August 2022	0.000
SW-07²	
1 July 2022	0.006
SW-09³	
1 July 2022	Discharge was not calculated due to insufficient data (depth data was not collected).
5 August 2022	

Note: Stagnant wetland was observed at SW-01 and SW-02 therefore flow measurement were not taken. Hence, the discharge cannot be calculated.

¹ On 18 October 2022, the wetland at SW-05 had no connectivity to the culvert. Hence, there was no transect available to collect velocity measurement with a flow meter.

² On 5 August 2022 and 18 October 2022, the watercourse at SW-07 was dry.

³ On 18 October 2022, there wasn't enough water in the creek at SW-09 to collect velocity measurement with a flow meter.



6.2.2 Analysis

Five surface water locations were sampled quarterly and submitted for laboratory analysis of the parameters listed in Section 4.2. The following exceedances in Table 6-3 were identified:

Table 6-3: Surface Water Analytical Results Exceedances Summary

Sample Location	BC WQG AW Chronic	BC WQG AW Acute
SW-01 (Up-stream)	<ul style="list-style-type: none"> • Dissolved Aluminum (May/August 2022) • Total Cobalt (August 2022) • Total Manganese (August 2022) • Total Zinc (August 2022) • Toluene (October 2022) 	<ul style="list-style-type: none"> • Alkalinity (October 2022) • Dissolved Aluminum (May/August /October 2022) • Total Arsenic (August 2022) • Total Iron (August/October 2022) • Total Manganese (August 2022) • Dissolved Iron (August/October 2022) • Total Silver (August 2022)
SW-02 (Up-stream)	<ul style="list-style-type: none"> • Dissolved Aluminum (May) • Dissolved Iron (August/October 2022) • Toluene (October 2022) • Total Zinc (October 2022) • Ammonia (October 2022) 	<ul style="list-style-type: none"> • Total Arsenic (October 2022) • Total Iron (August/October 2022) • Total Zinc (October 2022)
SW-05 (Down-stream)	<ul style="list-style-type: none"> • Dissolved Aluminum (May/August 2022) • Dissolved Iron (August/October 2022) 	<ul style="list-style-type: none"> • Alkalinity (May 2022) • Dissolved Aluminum (May/August 2022) • Total Iron (August 2022)
SW-07 (Down-stream)	<ul style="list-style-type: none"> • Dissolved Aluminum (June 2022) 	<ul style="list-style-type: none"> • Dissolved Aluminum (June 2022)
SW-09 (Down-stream)	<ul style="list-style-type: none"> • No Exceedances 	<ul style="list-style-type: none"> • No Exceedances

The surface water analytical results for the 2022 EEM program are summarized in Table 6 in Appendix F. Laboratory analytical certificates are provided in Appendix G.

6.3 Facility

6.3.1 Leachate Monitoring

Leachate at the sand filter manhole and the weir of Wetland 4 outlet locations were monitored during sampling in 2022. The leachate monitoring data are presented in Table 3 in Appendix F.

6.3.2 Leachate Analysis

Two leachate locations (from Wetland 4 and the sand filter) were sampled three times in 2022 and submitted to the laboratory for analysis of the parameters listed in Section 4.3. The reported



concentrations of analysed parameters in the leachate samples were less than the applicable OC criteria except for the following:

- The reported leachate concentration for iron in the leachate sample collected from the sand filter in March 2022 was greater than the OC criteria.
- The reported leachate concentration for iron in the sample collected from the weir of Wetland 4 in August 2022 was greater than the OC criteria.

The leachate analytical results for the 2022 EEM program are summarized in Table 7 in Appendix G. Laboratory analytical certificates are provided in Appendix H.

6.4 Composite Soil

One composite soil sample was collected from the phytoremediation area in March 2022. The analytical results for the phytoremediation soil sample were compared to the applicable CSR IL standards. The reported concentrations of total arsenic exceeded the applicable BC CSR IL standard. The reported soil concentrations for the remaining analyzed parameters were less than the CSR IL standards.

The composite soil analytical results for the 2022 EEM program are summarized in Table 8 in Appendix F. Laboratory analytical certificates are provided in Appendix G.

6.5 Toxicity Data

The results of the bioassay conducted using daphnia magna LC50 for the discharge sample obtained from Wetland 4 are presented in Table 9 in Appendix F. The toxicity data met the OC #17226 criteria as outlined in Section 3.4. No harmful effects were observed on the survival rate of *Daphnia magna*, as the LC values were higher than the maximum concentration tested (i.e., >100% v/v). The tests conducted in 2022 using treated effluent from Wetland 4 outlet indicated 0% mortality of *Daphnia magna*.



7 QA/QC Summary

With the exception of the RPD of 71% for dissolved cadmium at SW-05 and its duplicate SW-21, the RPDs were less than the data quality objectives (DQOs). As the reported concentration of cadmium for both the parent and duplicate samples were less than the most conservative guideline, the elevated RPD did not impact the conclusions of this report.

7.1.1 Laboratory QA/QC

Stantec reviewed the laboratory QA/QC data and identified the following outliers.

Work Order VA22A1147

- The laboratory reported that Wetland 4 @ Outlet and Facility 1 samples exceeded ALS recommended hold times (i.e., 15 minutes) for pH prior to sample reception. However, pH was measured in the field and met the OC Leachate Criteria. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 4000590 could not be accurately calculated due to high analyte background in sample. However, total ammonia in the samples analyzed met the OC Leachate Criteria.

Work Order VA22A6757

- The laboratory reported that the duplicate results for % saturation in Composite Soil Sample were outside the ALS DQO due to sample heterogeneity. However, saturation percentage is not regulated under the BC CSR.

Work Order VA22A6759

- The laboratory reported that Wetland 4 @ Outlet, Post Sand Filter / Pre Phyto and Facility 1 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above samples was measured in the field and the pH values met the OC Leachate Criteria. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that the initial method blank (QC Lot: 452298) for the submission had positive results for total vanadium. Low level samples were repeated with new QC. High level results (>5X initial method blank level) and non-detect results were reported and were deemed defensible.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 452839 could not be accurately calculated due to high analyte background in sample. However, total ammonia in the samples analyzed met the OC Leachate Criteria.

Work Order VA22C4642



- The laboratory reported that Wetland 4 @ Weir, Pre Phyto Post Sand Filter and Wetland 2 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the OC Leachate Criteria. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.

Work Order VA22C4785

- The laboratory reported that matrix spike recovery of dissolved silver in BH-02 was less than the lower DQO. The dissolved silver concentration in BH-02 is below laboratory RDL therefore matrix spike recovery not meeting the DQO does not impact the interpretation of dissolved silver data at BH-02.
- The laboratory reported that BH-01, BH-02 and BH-03 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC CSR standards. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 699759 could not be accurately calculated due to high analyte background in sample. However, total ammonia in the groundwater samples analyzed was below the applicable CSR standards.

Work Order VA22C4786

- The laboratory reported that SW-01 and SW-02 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 699759 could not be accurately calculated due to high analyte background in sample.

Work Order VA22C5460

- The laboratory reported that matrix spike recovery of dissolved lithium in laboratory control sample was greater than the upper DQO. Dissolved lithium concentrations in the analyzed groundwater samples were below the applicable BC CSR standards. Therefore, matrix spike recovery not meeting the DQO does not impact the interpretation of overall dissolved lithium data in groundwater.
- The laboratory reported that BH-4A, BH-5B and Field Blank exceeded ALS recommended hold times for anions and nutrients prior to sample reception. However, the reported results for the anion and nutrients were below the applicable BC CSR standard, therefore samples analyzed outside recommended hold times does not affect the overall interpretation of anion and nutrients results in the groundwater.



- The laboratory reported that BH-4A, BH-5B and Field Blank samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH is not regulated under the BC CSR for comparison.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 714828 could not be accurately calculated due to high analyte background in sample.

Work Order VA22C5462

- The laboratory reported that matrix spike recovery of dissolved lithium in laboratory control sample was greater than the upper DQO. Dissolved lithium is not regulated under BC WQGs.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 711266 could not be accurately calculated due to high analyte background in sample.
- The laboratory reported that SGW-02, SGW-04, SGW-05, SW-05, SW-09 and SW-21 exceeded ALS recommended hold times for anions and nutrients prior to sample reception. However, the reported results for the anion and nutrients were below the applicable BC WQGs, therefore samples analyzed outside recommended hold times does not affect the overall interpretation of anion and nutrients results in surface water.
- The laboratory reported that SGW-02, SGW-04, SGW-05, SW-05, SW-09 and SW-21 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.

Work Order VA22B9557

- The laboratory reported that method blank result of dissolved organic carbon in a QC sample exceeded permitted value. However, associated sample result was less laboratory RDL and was considered reliable.
- The laboratory reported that biochemical oxygen demand (BOD) and dissolved orthophosphate in Wetland 4 @ Outlet sample exceeded ALS recommended hold time for BOD prior to sample analysis. However, BOD and dissolved orthophosphate are not regulated under OP Leachate Criteria.
- The laboratory reported that Wetland 4 @ Outlet sample exceeded ALS recommended hold times (i.e., 15 minutes) for pH prior to sample reception. However, pH was measured in the field and met the OC Leachate Criteria. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 622879 could not be accurately calculated due to high analyte background in sample.

Work Order VA22B6058



- The laboratory reported that method blank result of nitrate in a QC sample exceeded permitted value. However, associated sample result was less laboratory RDL and was considered reliable.
- The laboratory reported that Treated Leachate to Phyto and SW-21 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the OC Leachate Criteria. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.

Work Order VA22B1224

- The laboratory reported Field Blank, SW-01, SW-02, SW-05 and SW-21 exceeded ALS recommended hold times for anions and nutrients prior to sample reception. However, the reported results for the anion and nutrients were below the applicable BC WQGs, therefore samples analyzed outside recommended hold times does not affect the overall interpretation of anion and nutrients results in surface water.
- The laboratory reported that Field Blank, SW-01, SW-02, SW-05 and SW-21 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.

Work Order VA22B2453

- The laboratory reported that method blank result of dissolved potassium in a QC sample exceeded permitted value. However, associated sample result was less laboratory RDL and was considered reliable.
- The laboratory reported that SGW-01, SGW-05, SW-07, SW-08, SW-09, SGW-02 and SGW-04 exceeded ALS recommended hold times for total organic carbon prior to sample reception. However, the reported results for the total organic carbon were below the applicable BC WQGs, therefore samples analyzed outside recommended hold times does not affect the overall interpretation of total organic carbon results in surface water.
- The laboratory reported that SW-09, SGW-05, SW-08, SGW-01, SW-07, SGW-04 and SGW-02 samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.

Work Order VA22B8570

- The laboratory reported that method blank result of total aluminum in a QC sample exceeded permitted value. However, associated sample result was less laboratory RDL and was considered reliable.



- The laboratory reported that SW-02, SW-05, SW-09 and SW-21 samples exceeded ALS recommended hold times for nitrite prior to sample reception. However, the nitrite values were below laboratory RDLs. Further, it is logistically not possible to submit the sample to ALS within the recommended hold time of 3 days.
- The laboratory reported that SW-01, SW-02, SW-05, SW-09, SW-07, SW-21 and Travel Blank samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.
- The laboratory reported that matrix spike recovery of total ammonia in QC Lot: 605277 could not be accurately calculated due to high analyte background in sample.

Work Order VA22B5770

- The laboratory reported that BOD and dissolved orthophosphate in Wetland 4 @ Outlet sample exceeded ALS recommended hold time for BOD prior to sample analysis. However, BOD and dissolved orthophosphate are not regulated under OP Leachate Criteria.
- The laboratory reported that SW-21 and Wetland 4 @ Outlet samples exceeded ALS recommended hold times for nitrite and nitrate prior to sample reception. However, the nitrite and nitrate values were below laboratory RDLs. Further, it is logistically not possible to submit the sample to ALS within the recommended hold time of 3 days for both nitrite and nitrate.
- The laboratory reported that Field Blank, SW-21 and Wetland 4 @ Outlet samples exceeded ALS recommended hold times for pH prior to sample reception. However, pH in the above sample was measured in the field and the pH values met the applicable BC WQGs. Further, it is practically not possible to submit the sample to ALS within the recommended hold time of 15 minutes.



8 Trend Analysis

To assess the changes in water quality over time a temporal graph of select EEM data for groundwater and surface water was completed and is presented in Appendix H. Non-detectable results were plotted at the detection limit. The time frame represented in the temporal graphs is 2017 to 2022. For consistency purposes, the parameters selected for trend analysis follow previous EEM reports and include the following:

- Ammonia
- Electrical Conductivity
- Chloride
- Sulphate
- Iron (dissolved for groundwater, total for surface water)

These geochemical parameters are used as a screening list to assist in identifying if something may have been introduced into an aquifer or surface water and is influencing the geochemistry or surface water chemistry. The following upward trends were identified in the temporal plots.

- Reported concentrations of ammonia appear to be decreasing in monitoring wells BH05-B and BH-02,
- Conductivity and reported concentrations of chloride in groundwater appear to be trending upward in monitoring BH05-B.
- Reported concentrations of sulphate in groundwater appear to be trending upward in monitoring well BH04-B.
- Reported concentrations of dissolved iron appear to be decreasing in monitoring wells BH04B and BH-05B.
- Conductivity and reported concentrations of chloride and sulphate in surface water appear to be trending upward at surface water location SW-09.
- Conductivity and reported concentrations of ammonia in surface water appear to be trending upward at surface water location SW-02.
- Reported concentrations of chloride in surface water appear to be trending upward at surface water location SW-07.
- Reported concentrations of sulphate appear to be decreasing in surface water at SW-07.
- Reported concentrations of total iron appear to be decreasing in the surface water samples.



9 Conclusion and Recommendations

Based on the information gathered and observations made during the 2022 EEM monitoring program, Stantec offers the following conclusions:

- Five groundwater wells were sampled in 2022 (BH-01 to BH-05). The reported concentrations of chloride in groundwater from BH-5B was greater than the BC CSR Drinking Water (DW) standards. Historically, the concentration of chloride in samples from groundwater well BH-5B appear to be elevated. This groundwater well is located near both the Yellowhead Highway and the access road to the Site, so it is possible that there may have been some of influence from road salting.
- Four standpipe piezometers were sampled in June and October 2022 (SWG-01, SWG-02, SGW-04 and SGW-05) for shallow groundwater. The following exceedances of the WQGs were identified:

Table 9-1: Summary of Shallow Groundwater Exceedances of BC WQGs

Location	June 2022	October 2022
SGW-01	<ul style="list-style-type: none"> • dissolved aluminum 	no exceedances
SGW-02 (Down-gradient)	<ul style="list-style-type: none"> • dissolved iron • total iron 	<ul style="list-style-type: none"> • total arsenic • dissolved iron • total iron
SGW-04 (Down-gradient)	<ul style="list-style-type: none"> • dissolved cobalt • dissolved aluminum • dissolved iron • dissolved manganese • total cobalt • total mercury • total iron 	<ul style="list-style-type: none"> • dissolved cobalt • dissolved manganese • dissolved iron • total cobalt • total manganese • total mercury • toluene • total iron • total arsenic • total beryllium
SGW-05 (Down-gradient)	<ul style="list-style-type: none"> • dissolved cobalt • dissolved iron 	<ul style="list-style-type: none"> • dissolved cobalt • dissolved iron • total cobalt • total lead • total mercury • total zinc • total iron • total manganese • total arsenic • total beryllium



- These exceedances are likely attributable to natural concentrations in porewater; however, a more detailed study would be required to make this determination.
- Five surface water locations were sampled in May, June, August, and/or October 2022 (SW-01, SW-02, SW-05, SW-07 and SW-09). The following exceedances of the WQGs were identified:

Table 9-2: Summary of Surface Water Exceedances of BC WQGs

Location	May 2022	June 2022	August 2022	October 2022
SW-01	<ul style="list-style-type: none"> • dissolved aluminum 		<ul style="list-style-type: none"> • total cobalt • total manganese • total zinc • dissolved aluminum • total arsenic • total iron • dissolved iron • total silver 	<ul style="list-style-type: none"> • dissolved aluminum • toluene • alkalinity • total iron • dissolved iron
SW-02	<ul style="list-style-type: none"> • dissolved aluminum 		<ul style="list-style-type: none"> • dissolved iron • total iron 	<ul style="list-style-type: none"> • dissolved iron • toluene • total zinc • ammonia • total arsenic • total iron
SW-05	<ul style="list-style-type: none"> • dissolved aluminum • alkalinity 		<ul style="list-style-type: none"> • dissolved aluminum • dissolved iron • total iron 	<ul style="list-style-type: none"> • dissolved iron
SW-07 (sampled in June only)	-	<ul style="list-style-type: none"> • dissolved aluminum 	-	-

- These exceedances are likely attributable to natural concentrations in surface water; however, a more detailed study would be required to make that determination.
- Two leachate locations (from Wetland 4 and sand filter locations) were sampled in January and March 2022; Wetland 4 was also sampled in August 2022. The reported concentrations of analysed parameters in the leachate samples were less than the applicable OC criteria except for the following:
 - The reported concentration of iron in the leachate sample collected from the sand filter in March 2022 was greater than the OC permit criteria.
 - The reported concentration for iron in the leachate sample collected from the weir of Wetland 4 in August 2022 was greater than the OC permit criteria.



- One composite soil sample was collected from the phytoremediation area in March 2022. The reported concentrations of total arsenic exceeded the applicable BC CSR Industrial Land (IL) use standard for soils. The reported soil concentrations for the remaining analyzed parameters were less than the CSR IL standards.

Based on the analytical results and observations made during the 2022 monitoring program, Stantec recommends the following:

- The current monitoring program should be continued in 2023 in accordance with the requirements under the OC.
- A soil sample should be collected offsite from the phytoremediation orchard location to assess whether the elevated arsenic not in the 2022 EEM program is naturally occurring in the native soil.
- Surface water samples should be collected in areas hydraulically upgradient from the Site to provide a better data set on of the background concentrations present in the area.



10 Limitations

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report. The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

This report is limited by the following:

- Stantec did not conduct, nor was present for the sampling or monitoring
- Historical data was provided to Stantec by RDKS, and is presumed to be accurate

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited



data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.



11 References

- BC ENV Field Sampling Manual, Version: 2013, Accessed at <https://www2.gov.bc.ca/gov/content/environment/research-monitoringreporting/monitoring/laboratory-standards-quality-assurance/bc-field-sampling-manual>, on April 20, 2023
- BC ENV. Protocol 21 For Contaminated Sites: Water Use Determination, Version 1 November 2017, Accessed at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_21.pdf, on April 20, 2023
- BC ENV. BC Ministry of Environment and Climate Change Strategy
- BC ENV Protocol 4 For Contaminated Sites: Establishing local background concentrations in soil, Version: 1 February 2023, Accessed at <https://www2.gov.bc.ca/assets/gov/environment/airland-water/site-remediation/docs/protocols/protocol04.pdf>, on April 20, 2023
- BC ENV. Contaminated Sites Regulation (2021), B.C. Reg. 179/2021
- BC ENV. Hazardous Waste Regulation (2022), B.C. Reg. 63/88
- Clague, The Surficial Geology Map of the Skeena River and Bulkley River Area, 1983
- Environmental Management Act. RSBC 2003 Chapter 53. Victoria, BC.
- EMA Operational Certificate #17226, 2020
- GeoBC's web-based mapping tool iMapBC, Accessed at <https://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc>, on April, 2023
- WSP Golder, Hazelton Waste Management Facility Environmental Effects Monitoring Report. WSP Golder, 2022



Appendices



Appendix A Site Plan



Eri, NASA, NGA, USGS, Esri, HERE, Garmin, Sphero, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCAN, Parks Canada, Sources: Esri, Airbus DS, USGS, NASA, CGAR, Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Maxar, Esri, HERE, Garmin, Sphero, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCAN, Parks Canada



Project: **Hazelton Waste Management Facility 2022 Environmental Effects Monitoring Program**

Regional District of **Kitimat-Stikine**
 Suite 300 - 4545 Lazelle Avenue
 Terrace, B.C. V8G 4E1

- Legend:
- Hazelton Waste Management Facility
 - Facility Sample
 - Monitoring Well
 - Surface Water Site
 - Watercourse 5k TRIM
 - Phyto Orchard
 - Tenure Lease
 - Waterbody
 - Wetland
- Engineered Water Features
- Provisional Aeration Pond
 - Equilization Pond
 - Sand Filter
 - Septage Bay
 - Wetland



Title: **Surface Water, Facility Sites & Groundwater Well Locations**

Scale: 6,000	Projection: NAD 1983 UTM Zone 9N
File: 5360-03-01-02-05	Date: June 5, 2023
Drawn: N. Lavoie	Reviewed: E. Blaney
Figure No:	Figure 1

Appendix B Operational Certificate





May 27, 2020

Tracking Number: 392981
Authorization Number: 17226

REGISTERED MAIL

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Dear Operational Certificate Holder:

Enclosed is Operational Certificate 17226 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the operational certificate.

This operational certificate does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the operational certificate holder. It is also the responsibility of the operational certificate holder to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this operational certificate will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data, reports, non-compliance notifications and non-compliance reports pertinent to the permit are to be submitted to the Environmental Protection Division via email or other electronic means as directed in the following web link: <https://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions>

Yours truly,

A handwritten signature in blue ink, appearing to read "Karen Moores".

Karen Moores, P.Ag.
for Director, *Environmental Management Act*

17226

page 2

Date: May 27, 2020

Authorizations - North Region

Enclosure

cc: Environment Canada



MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

17226

for the

HAZELTON REGIONAL LANDFILL

Under the Provisions of the Environmental Management Act and in accordance with the Regional District of Kitimat-Stikine's Solid Waste Management Plan, the

REGIONAL DISTRICT OF KITIMAT-STIKINE

Suite 300 – 4545 Lazelle Avenue

Terrace, British Columbia

V8G 4E1

is authorized to store, handle, treat and discharge municipal waste from Hazelton, Kitwanga and surrounding areas at the Hazelton Regional Landfill subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

1. LOCATION OF LANDFILL PROPERTY

The location of the property where discharges are authorized to occur is the SW ¼ Part of District Lot 1574, Cassiar Land District.

2. DESIGN, OPERATIONS and CLOSURE PLAN

The landfill and associated works must be designed by qualified professionals [such as engineer(s) and/or geoscientist(s)] registered in the Province of British Columbia who have expertise in the field of landfill design. These details must be incorporated into a "Design, Operations, and Closure Plan" (DOCP) which must be reviewed, updated and submitted to the Director for approval every 5 years

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)

A handwritten signature in blue ink, appearing to read "Karen Moores".

Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

thereafter. The landfill must be operated at all times in accordance with the approved DOCP.

The DOCP must include, at a minimum:

- extent and location of each disposal area, clearly shown on a site plan;
- quantities of wastes (solid, liquid and leachate) discharged;
- works associated with each disposal area;
- any proposed restrictions on salvaging by the public;
- scaled site plan accurately showing the legal survey, the engineered final design footprint, and final design contours;
- proposed litter control measures on-site and at neighbouring properties;
- proposed measures to meet the Landfill Gas Regulation and landfill gas health and safety requirements;
- proposed surface and groundwater management plan including an assessment of the adequacy of the number and location of groundwater monitoring wells;
- proposed preliminary water quality exceedance response plans;
- proposed maximum lift height of compacted waste;
- proposed leachate system design and management plan, including the priority of and circumstances dictating when effluent is sent to the phytoremediation stand and when it is sent to the infiltration trench;
- proposed maximum allowable surface area of exposed waste;
- proposed maximum volume of waste in a cell at any given time;
- proposed method, coverage (area) and timing of progressive closure;

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- design, construction and operation of the liquid waste (septic tank pumpage) disposal lagoon(s);
- signage and fencing at and around the liquid waste disposal lagoon(s);
- nature/volume of wastes to be discharged at the liquid waste lagoon(s);
- location of the designated wood residue open burning area;
- groundwater model that, in relation to the final landfill design:
 - (i) is developed by a qualified professional (experienced in groundwater hydrogeology);
 - (ii) outlines the groundwater regime including flow directions, estimated rates, inferred leachate plume, etc. at and in the surrounding area of the landfill site influenced by landfill leachate;
 - (iii) appropriately assesses the correct number and location of wells such that groundwater can be intercepted and assessed to determine groundwater quality and flow direction;
 - (iv) estimates the loadings of Potential Contaminants of Concern (PCOC)'s from landfill leachate to the environment. The groundwater model and PCOC loading estimates must be updated with each review of the DOCP.
- maximum allowable slopes of the various disposal areas;
- engineered final design footprint delineating the maximum extent of solid waste disposal allowable at the facility horizontally and vertically;
- engineered excavation grade for municipal solid waste;
- landfill design waste density;

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- proposed notification schedule for closure;
- proposed closure plan including:
 - i) intended end-use of the landfill property after closure;
 - ii) anticipated total waste volume, tonnage, and life remaining of the landfill;
 - iii) a topographic plan showing the final elevation contours of the landfill and surface water diversion and drainage controls;
 - iv) design of the final cover suited to the intended end-use of the site, including the thickness and permeability of barrier layers and drainage layers, and information on topsoil, vegetative cover and erosion prevention controls;
 - v) procedures for notifying the public about the closure and about alternative waste disposal facilities;
 - vi) nuisance wildlife control procedures;
 - vii) a comprehensive long-term monitoring plan by a qualified professional, including groundwater monitoring, surface water monitoring, aquatic effects monitoring (including acute and chronic toxicity testing if determined to be necessary), landfill gas monitoring, leachate monitoring, final cover monitoring, and erosion and settlement monitoring, for a minimum post-closure period of 25 years;
 - viii) design, if necessary, for the collection, storage and treatment/use of landfill gas for a minimum 25-year post-closure period
 - ix) plan for the operation of any required pollution abatement engineering works such as leachate collection and treatment systems, for a minimum post-closure period of 25 years; and

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- x) an estimated cost updated every five years, to carry out closure and post-closure activities for a minimum period of 25 years.

3. DISCHARGE OF MUNICIPAL SOLID WASTE

Municipal solid waste is authorized to be discharged to ground in accordance with the approved DOCP. The site reference number for this discharge is E288569.

4. STORAGE AND HANDLING OF WASTES FOR SALVAGE AND RECYCLING

Wastes are authorized to be stored and handled for salvage and recycling in accordance with the approved DOCP.

5. DISCHARGE OF MUNICIPAL LIQUID WASTE

Municipal liquid waste is authorized to be discharged to an appropriate discharge facility in accordance with the approved DOCP. The site reference number for this discharge is E288571.

6. DISCHARGE OF TREATED EFFLUENT TO PHYTOREMEDIATION STAND

Treated effluent is authorized to be discharged to the Phytoremediation Stand in accordance with the approved DOCP and Section 9. The site reference number for this discharge is E288572.

7. DISCHARGE OF TREATED EFFLUENT TO WETLAND #4 INFILTRATION TRENCH

Treated effluent is authorized to be discharged to the Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage in accordance with the approved DOCP and Section 9. The site reference number for this discharge is E309786.

8. DISCHARGE OF AIR CONTAMINANTS FROM OPEN BURNING OF WOOD RESIDUE

Air contaminants are authorized to be released from the open burning of wood residue in accordance with this section and the approved DOCP. The site reference number for this discharge is E288570.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

8.1 Location

Any open burning of selected wastes must be restricted to the designated open burning area as shown on the attached site plan and as identified on-site. Signs which identify the nature of the waste acceptable at the designated open burning area must be erected and maintained.

8.2 Quantity, Timing, and Duration of Discharge

The maximum authorized quantity of wood residue to be open burned during each event is that which has accumulated at the time of burn initiation.

The maximum authorized duration of each burn must be limited to the period between two hours after sunrise on the day of ignition, and sunset on the following day. Each open burn must be completely extinguished at the end of the authorized burn duration.

Should a condition arise which prevents the burn pile(s) from being burned within this period, the Director must be notified in accordance with this authorization.

8.3 Nature of Wastes

Acceptable materials for burning may only include dry, unpainted, untreated demolition, construction and packing-related wood residue, clean stumps, prunings, vegetative debris and brush, but must exclude nuisance-causing combustibles such as glue-containing wood, painted and treated wood, sawdust, mulch, wood chips, rubber, plastics, tars, insulation, roofing material, asphalt shingles, etc.

8.4 Favourable Weather for Smoke Dispersion

Open burning must not proceed unless the recorded Environment Canada Ventilation Index Forecast for Smithers is greater than 55 (GOOD) for both days of the proposed burn.

The contact number for the forecast is 1-888-281-2992. Ventilation index forecasts can also be obtained after 7:00 a.m. from the following Environment Canada website:

http://www.weatheroffice.gc.ca/forecast/textforecast_e.html?Bulletin=flcn39.cw
[vr](#)

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

A burn registration number must be obtained from the Ministry of Forests (1-888-797-1717) prior to ignition.

Open burning of wood residue must not be initiated or continued if the local air flow will cause the smoke to negatively impact a nearby population or cause pollution. No burning must occur during periods of fire hazard or when burning is prohibited by other agencies.

8.5 Minimization of Smoke

Each burn must be tended in a manner that ensures minimization of smoke emissions. Measures to minimize smoke must include, but not necessarily be limited to: stacking of waste in a manner that eliminates inclusion of dirt; waiting to burn until wastes are reasonably dry after any significant precipitation event; and using adequate equipment and staff.

8.6 Extinguishment Contingency Plan

Prior to burning, a contingency plan must be in place detailing how the open burn will be extinguished in the event of any of the following occurring:

- i) Inadequate smoke dispersion in the surrounding environment;
- ii) wood continues to smoulder after the authorized burn period; and,
- ii) the Director requires that the open burn be extinguished for environmental protection reasons

8.7 Extinguishment

All combustion must be completely extinguished at the end of the authorized period as set out in Section 8.2

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

9. LEACHATE MANAGEMENT REQUIREMENTS

9.1 Leachate Management

9.1.1 Leachate Containment

A leachate containment and appropriate barrier system must be utilized. The barrier system must consist of a minimum of 2 metres of natural *in-situ* clay with a hydraulic conductivity of 1×10^{-6} cm/s or less. Alternatively, an engineered barrier may be used provided it is equivalent to or better than the natural clay barrier specified above.

9.1.2 Leachate Collection

A leachate collection system must be utilized. A continuous drainage blanket must be established beneath all landfill phases. The drainage blanket must consist of, or be equivalent to, a minimum 300 mm thick layer of clean gravel with an effective hydraulic conductivity exceeding 1×10^{-1} cm/s. The leachate collection system must be designed such that the hydraulic head on top of the barrier layer does not exceed 300 mm at any time.

9.1.3 Quantity of the Discharge

The maximum authorized quantity of discharge is indeterminate.

9.1.4 Timing of the Discharge

The discharge may occur 24 hours/day, 7 days/week, 365 days/year if in accordance with Sections 9.1.5, 11.1 and 11.2.

9.1.5 Characteristics of the Discharge

Acceptable constituents of the effluent include landfill leachate, liquid waste from the septage facility, site storm water, and run-off from the Phytoremediation Stand. The effluent must be directed in order of priority to the Phytoremediation Stand (Section 6), or to

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage (Section 7) and as established in the DOCP.

The characteristics of the effluent discharged to the Phytoremediation Stand (Section 6) or Wetland #4 Infiltration Trench within the Ephemeral Creek drainage (Section 7) must not exceed the following limits:

Daphnia magna acute lethality ^{*,1}	50% survival in 100% concentration, Minimum
Total Nitrogen	60 mg/L
Ammonia	30 mg/L
pH	6.5 to 8.5
Chloride	3750 mg/L
Total Iron	4.5 mg/L
Total Zinc	75 mg/L
Total Cadmium	0.1 mg/L

* not applicable if discharge only occurs to the Phytoremediation Stand

¹ this limit became effective June 30 2019 to allow for commissioning of the works and an assessment of the first year of monitoring data and effectiveness to occur as required in Section 12.2(iii)

9.1.6 Site Water Balance Model and Phytoremediation Stand Uptake Review

By December 31 2023 a qualified professional must re-evaluate the site water balance model including the rate of effluent uptake by the trees in the Phytoremediation Stand. Recommendations for any alterations to the discharge requirements in this section must be submitted to the Director by June 30 2024.

9.1.7 Authorized Works

The authorized works include storm water collection infrastructure, leachate collection and treatment facilities including an equalization basin, 4 engineered wetlands, and a sand filter and

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

related appurtenances, with the final point of discharge being to either the Phytoremediation Stand or to the Wetland #4 Infiltration Trench within the Ephemeral Creek drainage approximately as shown on the attached Site Plan A. It is permissible to bypass one or more components of the authorized works in order to achieve improved effluent quality through recirculation or additional retention time. In all cases, Section 9.1.5 must be met prior to discharge.

9.1.8 Authorized Works Functionality

The operational certificate holder must not discharge under this authorization unless the authorized works are complete and fully functional according to the treatment flow options as established in the DOCP.

10. GENERAL REQUIREMENTS

10.1 Lethal Toxicity of the Discharge

Commencing July 1, 2019 (post facility commissioning period) for any discharge to the Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage (Section 7) the treated effluent and storm water must not be lethally toxic to aquatic organisms at the point of discharge (Wetland #4 Outlet Culvert) For the purposes of this 48 hour test, in >95% effluent concentration, there must be a minimum 50% survival of Daphnia magna. This Section does not apply to discharges of effluent to the Phytoremediation Stand (Section 6).

10.2 Prohibited Wastes

No wastes as defined by the Hazardous Waste Regulation (B.C. Reg. 243/2016, November 1, 2017) must be treated or disposed of at this site except as authorized by the Director. Materials which are regulated under the Recycling Regulation must not be treated or disposed of at this site if local marshalling and recycling facilities are available.

10.3 Waste Asbestos

Notwithstanding Section 10.2 of this operational certificate, the disposal of waste asbestos under Section 3 of this operational certificate and in

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

compliance with the requirements of Section 40 of the Hazardous Waste Regulation is hereby authorized.

10.4 **Contaminated Soil**

Soil that contains contaminants in concentrations less than "Hazardous Waste" as defined by the Hazardous Waste Regulation may be disposed at the landfill site. Disposal does not include use as final cover material.

10.5 **Waste Measurement**

The quantity of waste material landfilled at the site must be measured or estimated on an annual basis. This data must be made available for inspection upon request.

10.6 **Surface Water Quality Exceedances Response Plan**

The operational certificate holder must submit to the Director, a response plan detailing how the operational certificate holder will report and respond to:

- exceedances at sampling station SW-09 of the British Columbia Water Quality Guidelines for the Protection of Aquatic Life (BCWQAL)

The response plan must be submitted a minimum of 60 days prior to the commissioning (first discharge) of the leachate treatment system. Upon completion, the response plan must also form a part of the approved DOCP.

10.7 **Surface Water Quality Assessment**

If, during monitoring under Section 11.4, surface water quality measured at the property boundary (SW-09) exceeds the BCWQAL then the operational certificate holder must implement the Surface Water Quality Exceedances Response Plan required in Section 10.6. The Director must be notified within 24 hours of the operational certificate holder triggering the response plan required in Section 10.6.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

10.8 Ground Water Quality Exceedances Response Plan

The operational certificate holder must submit to the Director, a response plan detailing how the operational certificate holder will report and respond to:

- exceedances at sampling stations SGW-2, SGW-4, SGW-5, BH-3 and BH-5B of the Contaminated Sites Regulation Schedule 6 Drinking Water Standards

The response plan must be submitted a minimum of 60 days prior to the commissioning (first discharge) of the leachate treatment system. Upon completion, the response plan must also form a part of the approved DOCP.

10.9 Ground Water Quality Assessment

If, during monitoring under Section 11.3, ground water quality measured at sampling stations SGW-2, SGW-4, SGW-5, BH-3 and BH-5B exceeds the Contaminated Sites Regulation Schedule 6 Drinking Water Standards then the operational certificate holder must implement the Ground Water Quality Exceedances Response Plan required in Section 10.8. The Director must be notified within 24 hours of the operational certificate holder triggering the response plan required in Section 10.8.

10.10 Electric Fencing

10.10.1 Design, Construction and Maintenance

Wherever required, electric fencing and gate systems at the landfill must be designed, constructed, and maintained such that bears are prevented from entering into the landfill through any portion of the fence or gates at any time of the day.

10.10.2 Fence Type

Fencing may be either high tensile smooth wire or fence fabric (e.g., mesh-wire, page-wire, chain link or the like). The configuration of a high tensile smooth wire fence must consist of a minimum of eight strands, with four energized strands alternating with four grounded strands as follows: the bottom strand must be a grounded (-) strand and must not be more than 10 cm from the earth at any location; and

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

thence starting from the bottom strand, the other seven strands must be spaced 15 ± 2 cm, 15 ± 2 cm, 15 ± 2 cm, 20 ± 2 cm, 20 ± 2 cm, 20 ± 2 cm, and 25 ± 2 cm. Additional strands to this minimum configuration may be used.

A fence fabric may be used instead of high tensile smooth wire. The fence fabric must: be a minimum of 1.22-metre-high; be constructed of a minimum wire thickness of 11 gauge, and have a maximum mesh size of 15 cm. The bottom of the fabric must not be more than 10 cm from the earth at any location. Any uncharged fence fabric must have a minimum of four strands of charged wires on an outrigger system, spaced as follows: the first strand must not be higher than 25 cm from the earth; and each of the remaining three strands must be spaced approximately 25 cm apart from adjacent charged strands.

10.10.3 Wire Tension

For a high tensile smooth wire fence construction, all strands must be tightened to a minimum of 125 lbs tension at 20°C. The required tension is to be corrected for temperature by use of the following formula for 12-½ gauge high tensile steel wire:

$$Tension = 125 - 2.5(Temperature - 20)$$

where: *Tension* is in lbs force

Temperature is in °C

10.10.4 Post Spacing

Fence posts must be spaced a maximum of 7.5 metres apart.

10.10.5 Grounding System

A grounding system must be installed consisting of solid grounding rods (i.e., not pipe) with a minimum diameter of 16 mm (5/8 inch) that have a buried length of at least 2 metres. A minimum of three grounding rods (spaced at least 3 metres apart) must be installed and connected to the energizer. Alternative energizer grounding systems (e.g., grounding plates, or a deep-driven grounding system) may be used provided the grounding is equivalent to or better than three grounding rods. A grounding rod (or equivalent) must be installed at least once every 450 metres along the fence and connected to the

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

grounded wire strands or uncharged fence fabric. Additional grounding may be required for dry sites or if other conditions affect proper grounding.

10.10.6 Period of Operation

Electric fencing must be fully operational during the period of April 1 to October 31 inclusive each year and at any other time of year when there is bear activity in the immediate surrounding area. If snow is present during this period, any electrified strands above the snow line must be isolated from the remainder of the system and energized.

10.10.7 Minimum Voltage

Electric fencing must be operated with a minimum voltage of 6,000 volts.

10.10.8 Gate(s)

Any access through electric fencing for vehicles, equipment and personnel must consist of an electrified gate system that is closed during non-operating hours. The gate system must always be electrified to a minimum voltage of 6,000 volts except when being opened or closed. Any gate that is open during operating hours must be periodically checked by the attendant for bear activity during hours of operation. Gaps between the gate and the fence and the earth, and between gate panels (for a double-hung gate), must not exceed 10 cm.

10.10.9 Fence Inspections

The perimeter of the electric fencing must be inspected on every day that the site is open to the public and the voltage of the fencing measured at several points and at each gate using a proper electric fence voltmeter. The results of voltage testing must be recorded in a log book. Any results less than the minimum 6,000 volts must be immediately investigated for the cause of the low voltage (e.g., low battery, litter, vegetation, loose or crossed wires, broken insulators, breaks in the grounding system, etc.). Corrective actions to restore proper voltage must be immediately undertaken.

Any discernible penetrations through electric fencing by bears and other wildlife must be immediately reported to the Conservation

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Officer Service at 1-877-952-7277 and to the Director at 1-250-847-7260.

In cases of low voltage or signs of penetration attempts, inspections must be increased from once per week to once per day until proper voltage is fully restored and until there are no new signs of penetration attempts, respectively.

10.11 **Dead Animal Disposal**

Dead animals and animal parts must be disposed of in the solid waste disposal area and covered as soon as practicable with a minimum of 60 centimetres of soil and/or waste material such that flies and scavenging animals are prevented from accessing the carrion. Disposal of Specified Risk Material from cattle must only be done in accordance with Canadian Food Inspection Agency requirements and procedures.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

11. MONITORING REQUIREMENTS

The operational certificate holder must carry out an environmental monitoring program for the locations specified below and as shown on Site Plan “B” as follows:

11.1 Treated Effluent to Phytoremediation Stand

Location	Parameters	Frequency
<p><u>Effluent:</u></p> <p>E288572 Treated Leachate Post Sand Filter/Pre Phytoremediation Stand</p>	<p><u>Lab:</u> total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total organic carbon, orthophosphorus, COD, BOD, pH, EPH, BTEX/VPH total Kjeldahl nitrogen</p> <p><u>Field:</u> conductivity, pH, temperature, DO, turbidity, volume (flow measurement)</p>	<p><u>Lab/Field:</u> Once prior to first discharge event of the year (spring) and once per summer and fall</p> <p><u>Volume:</u> Continuous during discharge</p>
<p><u>Soil:</u></p> <p>E309686 Composite Soil Sample¹ from Phytoremediation Stand</p>	<p><u>Lab:</u> metals, salinity, nutrients, cations, ions</p>	<p><u>Lab:</u> Once annually, prior to first discharge of the year, as well as baseline data collection prior to very first discharge to the phytoremediation stand soil</p>

¹ Composite sample assembled from 4 locations from a pre-established list of 12 locations

Date issued: May 30, 2013
 Date amended: May 27, 2020
 (most recent)



Karen Moores, P.Ag.
 for Director, *Environmental Management Act*
 Authorizations - North Region

11.2 **Treated Effluent to Wetland #4 Infiltration Trench**

Location	Parameters	Frequency
<p><u>Effluent:</u></p> <p>E309786 Treated Leachate at Wetland#4 Outlet</p>	<p><u>Lab:</u> total metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total organic carbon, orthophosphorus, COD, BOD, EPH, BTEX/VPH, pH, total Kjeldahl nitrogen</p> <p><u>Field:</u> conductivity, pH, temperature, DO, turbidity, volume (flow measurement), visual¹</p> <p><u>Acute Toxicity:</u> Daphnia magna</p>	<p><u>Lab/Field:</u> Once prior to first discharge event of the year (spring) and once per summer and fall. Monthly if discharging at any time during other months</p> <p><u>Volume:</u> Continuous during discharge</p> <p><u>Visual:</u> Traverse area between Wetland # 4 Infiltration Trench and SW-09 twice per week during any period of discharge to identify any surface breakouts of discharge</p> <p><u>Acute Toxicity:</u> Once prior to start of each distinct continuous discharge event, or at least once per spring, summer and fall during discharge, whichever is more frequent</p>

¹Visual inspection to detect surfacing of effluent between Wetland #4 Infiltration Trench and SW-09. If surface flow of effluent is detected, then the discharge must cease and the Director must be notified within 24 hours

11.3 **Groundwater Monitoring**

Date issued: May 30, 2013
 Date amended: May 27, 2020
 (most recent)



Karen Moores, P.Ag.
 for Director, *Environmental Management Act*
 Authorizations - North Region

Location	Parameters	Frequency
E251512 BH-01 E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309748 SGW-3	<u>Lab:</u> Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	Quarterly → Annually ^{1,3}
E309749 SGW-4 E309750 SGW-5	<u>Field:</u> Conductivity, temperature, pH, water elevation ⁴	Monthly→Quarterly ^{1,3}

¹ Quarterly reduced to annually and monthly reduced to quarterly following two complete years of sampling

² Water elevation quarterly

³ Spring sampling to be conducted on or before May 15 of each year

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E309754 SW-06 E287410 SW-07 E273812 SW-08 E310968 SW-09 ¹ (property boundary)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
E310969 SW-10 (downstream of BH-03)	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

¹ SW-09 As near to property boundary as possible but at a location where discernible flow begins in ephemeral creek drainage

² Annual sample date should be consistent year to year, and preferably taken in fall

11.5 Ground and Surface Water Monitoring Procedures

11.5.1 Sampling Procedures

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

The operational certificate holder must carry out sampling in accordance with the procedures described in the “British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition (Permittee)” or most recent edition, or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html

11.5.2 Analytical Procedures

The operational certificate holder must carry out analyses in accordance with procedures described in the “British Columbia Laboratory Manual (2015 Permittee Edition)”, or the most recent edition or by alternative procedures as authorized by the Director.

A copy of the above manual is available on the Ministry web page at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html

11.5.3 Toxicity Sampling and Analytical Procedures

Samples must be collected from the discharge described in Section 7 and in accordance with Section 10.1 at frequencies established as per the monitoring program specified in Section 11.2 and tested for *Daphnia magna* acute lethality. *Daphnia magna* acute lethality test means the test to determine the acute lethality of effluent to *Daphnia magna* as set out in Reference Method EPS 1/RM/14.

11.5.4 Quality Assurance/Quality Control (QA/QC)

The operational certificate holder is required to conduct the following Quality Assurance and Control Program to determine the acceptability of data required by this permit and Section 2(d) of the Environmental Data Quality Assurance Regulation.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

- a) Obtain and keep current, the laboratory precision, accuracy and blank quality control criteria for each laboratory analysed parameter from the analytical laboratory(ies).
- b) Collect one duplicate sample during each sampling session from one of the discharge points.
- c) Each duplicate sample must be submitted to the laboratory; one of the pair identified as the regular sample, and the other, as a blind sample identified by a fictitious site-name established solely to identify the duplicate sample.
- d) For each parameter, report the results of the field duplicates in terms of the degree of variation as the relative percent difference.
- e) A sample collection blank must be prepared, containing distilled water, and preservative if required, and submitted as a blank sample with one sample set per session. If any result for any parameter indicates detectable concentrations, then efforts must be made to determine and control the source of contamination.

12 Data Analyses and Reporting

12.1 Log Book

As required by section 10.10.9 (fence inspections), the operational certificate holder must maintain a log book or electronic record. The log book or electronic record must be made available for inspection upon request by Ministry staff.

12.2 Annual Report

The operational certificate holder must collect and maintain data of effluent and soil analyses, and any other records required under this authorization for inspection when requested by Ministry staff and submit the data for the previous calendar year in a form satisfactory to the Director. The operational certificate holder must submit the annual report on or before June 30 each year for the previous calendar year.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

The operational certificate holder must submit all data required to be submitted under this section by email to the Ministry's Routine Environmental Reporting Submission Mailbox (RERSM) at EnvAuthorizationsReporting@gov.bc.ca or as otherwise instructed by the Director. For guidelines on how to properly name the files and email subject lines or for more information visit the Ministry website:

<http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox>

The annual report must contain at minimum:

- i) The type and tonnage or volume of waste received, recycled, composted and landfilled for the year;
- ii) Volume of effluent discharged to each of the Phytoremediation Stand and Wetland #4 Infiltration Trench within the Ephemeral Creek Drainage, with tabulation of volume and duration of each discharge event and the total volume discharged per year;
- iii) Occurrences or observations of wildlife attempting to access the facility;
- iv) The results of all required monitoring programs undertaken by the operational certificate holder for the site. Trend analysis, evaluation of any identified impacts of the discharges on the receiving environment in the previous year, and evaluation of the effectiveness of the established monitoring programs must be carried out by qualified professionals appropriate to the subject matter. Any identified recommendations must be included as they pertain to the ground water, surface water and aquatic effects (including acute toxicity) monitoring programs. Should the parameters and frequencies of the previous year's monitoring programs be identified as being not representative of receiving environment conditions, recommendations must be made for corrective actions that can be taken. Recommendations can be made to either increase or decrease parameters and frequency of any monitoring program

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

12.3 Non-Compliance Notification

The operational certificate holder must immediately notify the Director or designate by email at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the Director, of any non-compliance with the requirements of this authorization by the operational certificate holder and take remedial action to remedy any effects of such non-compliance. The operational certificate holder must provide to the Director with written confirmation of all such non-compliance events, including available test results, within 24 hours of the original notification, unless otherwise directed by the Director.

12.4 Non-Compliance Reporting

If the operational certificate holder fails to comply with any of the requirements of this authorization, the operational certificate holder must, within 30 days of such non-compliance, submit a written report that is satisfactory to the Director and includes, but is not necessarily limited to the following:

- a. all relevant test results obtained by the operational certificate holder related to the non-compliance,
- b. an explanation of the most probable cause(s) of the non-compliance, and,
- c. a description of remedial action planned and/or taken by the operational certificate holder to prevent similar non-compliances in the future.

The operational certificate holder must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox (CRSM) at EnvironmentalCompliance@gov.bc.ca or as otherwise instructed by the Director. For guidelines on how to report a non-compliance or for more information visit the Ministry website:

<http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox>

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

12.5 **Non-compliance Reporting and Exceedances**

The operational certificate holder must cause each data submission required by this authorization to include a statement outlining the number of exceedances of permitted discharges that occurred during the reporting period, the dates of each such exceedance, an explanation as to the cause of the exceedances, and a description of the measures taken by the operational certificate holder to rectify the cause of each such exceedance. If no exceedances occurred over the reporting period, the required statement may instead indicate that no exceedance of permitted discharges occurred during the reporting period.

12.6 **Toxicity Test Failure Reporting**

The operational certificate holder must report any failure of *Daphnia magna* acute toxicity tests as referenced in Sections 10.1, 11.2 and 11.5.3 to the Director within 24 hours of receiving the test failure result. As required in Section 9.1.5, beginning July 1, 2019, no discharge to the Wetland #4 Infiltration Trench may occur following a failed toxicity test unless there is a successful test result (non-failure) for *Daphnia magna* toxicity.

13. **Closure Requirements**

13.1 **Notification of Closure**

The operational certificate holder must notify the Director in writing of intentions to close the landfill site at least one year prior to closure date.

13.2 **Closure Plan**

As per Section 2 (Design, Operations and Closure Plan) closure requirements must be included in the DOCP.

13.3 **Closure Funding**

The operational certificate holder must ensure that sufficient funds will be available to provide for all closure and post-closure requirements as outlined in the closure plan required in Section 2, plus a reasonable contingency for any remediation which may be required.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

13.4 **Final Cover**

The final cover system must be designed by a qualified professional to match the intended end-use of the landfill site and to match the needs of any required environmental management systems (leachate minimization or recirculation, as the case may be, landfill gas collection and treatment, etc.). The final cover must consist of a layer of a minimum 600 mm of low permeability ($<1 \times 10^{-6}$ cm/s) compacted soil followed by a layer of topsoil suitable for establishment of vegetation. Use of higher permeability soil must first be approved by the Director. The final cover must be constructed with minimum and maximum slopes as specified by a qualified professional in the DOCP to promote runoff and minimize erosion, with appropriate run-on/runoff drainage controls, erosion controls, and gas venting controls. The site must be seeded with a grass/legume mixture suited to the local climate.

13.5 **Progressive Application of Final Cover**

Completed portions of the landfill must progressively receive final cover during the active life of the landfill. The maximum area of disposed refuse that has not yet received final cover must not exceed 25% of the total final footprint area. Final cover is to be applied according to the specifications identified in section 13.4.

14. **ENVIRONMENTAL IMPACT**

Inspections of the discharge will be carried out by Environmental Protection personnel as a part of the routine operational certificate inspection procedure. Based on these inspections and any other information available to the Director on the effect of the discharge on the receiving environment, the operational certificate holder may be required to undertake additional monitoring, install additional pollution control works, or change the method of operation.

Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)



Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

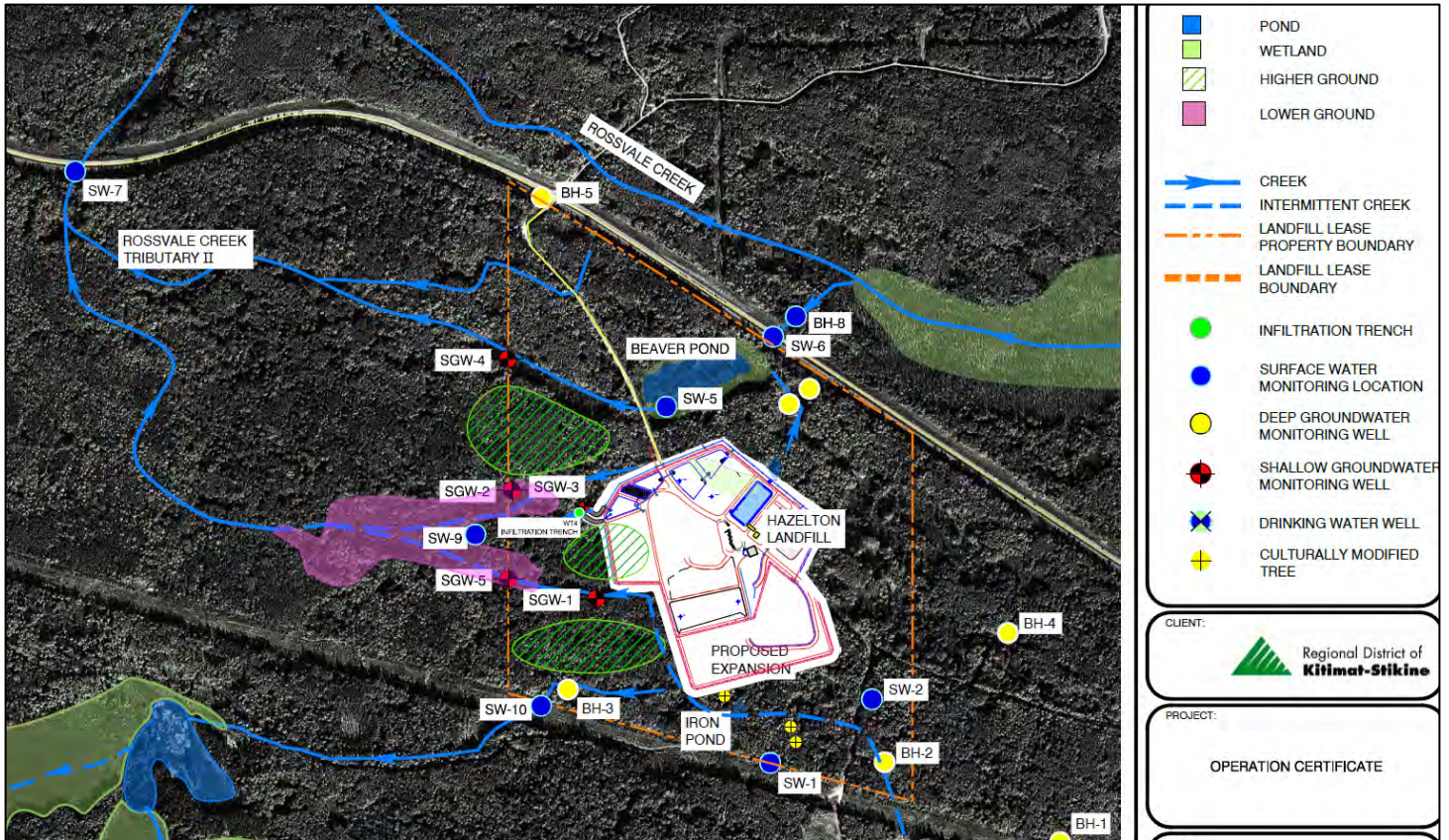
Site Plan A



Date issued: May 30, 2013
Date amended: May 27, 2020
(most recent)

Karen Moores, P.Ag.
for Director, *Environmental Management Act*
Authorizations - North Region

Site Plan B



Date issued: May 30, 2013
 Date amended: May 27, 2020
 (most recent)

Karen Moores, P.Ag.
 for Director, *Environmental Management Act*
 Authorizations - North Region



October 19, 2021

Tracking Number: 407972
Authorization Number: 17226

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Dear REGIONAL DISTRICT OF KITIMAT-STIKINE,

Your application for an Authorization amendment under the Environmental Management Act

In response to your letter dated October 18, 2021, and pursuant to Section 14(4) of the *Environmental Management Act*, the Director hereby consents to the following changes to Sections 11.3 and 11.4 of the Operational Certificate OC17226:

From Section 11.3:

11.3 Groundwater Monitoring

Location	Parameters	Frequency
E251512 BH-01 E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309748 SGW-3	<u>Lab:</u> Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	Quarterly → Annually ^{1,3}
E309749 SGW-4 E309750 SGW-5	<u>Field:</u> Conductivity, temperature, pH, water elevation ⁴	Monthly→Quarterly ^{1,3}

To Section 11.3:

11.3 Groundwater Monitoring

Location	Parameters	Frequency
E251512 BH-01 E251513 BH-02 E251514 BH-03 E252313 BH-4B E252314 BH-5B E309746 SGW-1 E309747 SGW-2 E309749 SGW-4 E309750 SGW-5	<u>Lab:</u> Dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH,	Quarterly → Annually ^{1,3}
	<u>Field:</u>	Monthly→Quarterly ^{1,3}

	Conductivity, temperature, pH, water elevation ⁴	
--	---	--

From Section 11.4:

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E309754 SW-06 E287410 SW-07 E273812 SW-08 E310968 SW-09 ¹ (property boundary)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
E310969 SW-10 (downstream of BH-03)	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

To Section 11.4:

11.4 Surface Water Monitoring

Location	Parameters	Frequency
E309751 SW-01 E309752 SW-02 E287409 SW-05 E287410 SW-07 E310968 SW-09 ¹ (property boundary)	<u>Lab:</u> Total metals, dissolved metals, alkalinity, chloride, fluoride, sulphate, hardness, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, TOC, COD, pH, EPH, BTEX/VPH	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons
	<u>Field:</u> Conductivity, temperature, pH, turbidity, flow rate, dissolved oxygen	Minimum annually ² and once during Spring, Summer, Fall if discharging during these seasons

The change to Section 11.3 was made due to inaccessibility and surface water inundation.

The changes to Section 11.4 were made due to a lack to relationship of the sampling points to the landfill surface water runoff.

In addition, the following Reporting requirement is added:

Addition of Section 12.7

12.7 Site-Wide Water Balance

Complete a site-wide water balance and assessment report for surface and groundwater monitoring. The report must be submitted to the Director for review and approval by the Director by October 1, 2022.

Please note that although a revised Authorization Document has not been produced at this time a copy of this letter is being placed on the Authorization file, as an addendum to the Authorization, to formally reflect the change.

This Authorization does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This Authorization is issued pursuant to the provisions of the Environmental Management Act to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the Environmental Management Act. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Yours truly,



Karen Moores, P.Ag.
Section Head, North Authorizations, Municipal and Smelter Sectors
Environmental Protection Division
Ministry of Environment and Climate Change Strategy
email: Karen.Moores@gov.bc.ca

ENCL: None

Appendix C Non-Compliance Report





To: Ministry of Environment and Climate Change Strategy
EnvironmentalCompliance@gov.bc.ca

From: Regional District of Kitimat-Stikine (RDKS)
300-4545 Lazelle Avenue, Terrace BC, V8G 4E1
Enviro.Dept@rdks.bc.ca

Date: December 14, 2022

Re: **Non-Compliance Report for MR-15681 – Surface Water Quality Exceedances**

Location: Meziadin Landfill, Block A of District Lots 2458 and 2459, Cassiar District

Background:

Meziadin Landfill is authorised under Operational Certificate ME-15684 (OC), which includes an Environmental Effects Monitoring Program (EEMP) for surface water and groundwater that are sampled twice a year. The landfill (Figure 1) is sited on the topographic high between the Meziadin and Nass Rivers, with the watershed divide between the two rivers crossing through the landfill tenure. The groundwater monitoring program includes wells within both the Meziadin and Nass River watersheds, while the surface water monitoring program includes surface water sites limited to the Nass River. The Hanna-Tintina Conservation Area abuts the landfill tenure to the north and west. The Gitanyow Wilp Wii Litsxw declared the entire Meziadin River watershed an indigenous protected area (IPA) in 2021 and published a management plan for the IPA in June of 2022.

The exfiltration treatment lagoon is leaking, with seepage forming a channel that runs into a wetland which drains towards the Nass River. Constructed drainage ditches on site convey run-off from the area near the metal pile towards a lagoon that drains to the Nass River. Additional sampling locations were established in October 2022 to sample these two locations, including an additional surface water site downstream of the landfill tenure on a tributary to the Meziadin River.

Nature of Non-compliance:

Water samples from the leaking lagoon (SW22-05), exceeded the Approved British Columbia Water Quality Guidelines for Aquatic Water (BCWQG-AW, the guideline) for dissolved and total iron, and total manganese. Down gradient site SW-DS exceeded the guideline for dissolved aluminum. Down gradient site SW22-01 exceeded the guideline for dissolved aluminum and dissolved iron. Down gradient site SW22-03 exceeded the guideline for total manganese. All exceedances were observed in the October 2022 sampling event.

Surface Water

During 2022 surface and groundwater wells were sampled on the following dates:

- April 13 (Spring)
- October 26 (Fall)

The surface water monitoring program prescribed under the OC for Meziadin Landfill includes an upstream and downstream monitoring site which drain towards the Nass River (SW-US & SW-DS), and sampling of the exfiltration treatment lagoon effluent (SW-03). During the fall 2022 sampling program, the RDKS took the proactive approach to monitor additional sites, including a tributary to the Meziadin River (SW22-01), a constructed ditch which conveys run-off and stormwater into a small lagoon (SW22-03 and SW22-04), and the effluent leak from the exfiltration treatment lagoon (SW22-05).

Surface water analytical data was compared to the BCWQG-AW. BCWQG for Drinking Water were not applied due to the site being greater than 1 kilometre away from any surface drinking water sources. The RDKS proactively added dissolved metal analysis to the surface water program in 2022 to meet the conditions of the BCWQG-AW which require dissolved metals to assess compliance for aluminum, cadmium, copper, and iron concentrations.

The BCWQG-AW includes short-term maximum (acute) and long-term average (chronic) criteria. Results were compared to both the acute and chronic criteria. Sites where only the chronic criteria are exceeded may serve as an alert to increase the sampling frequency (BC Ministry of Environment, 2016).

Constructed ditches are defined under the Environmental Management Act as a “*regularly maintained human-made trench or furrow dug in the ground for the primary purpose of conveying or draining surface water, storm water or irrigation water that may or may not contain water at all times of the year*”. Constructed Ditches must meet the criteria of Schedule 3.2 Aquatic Wildlife (Schedule 3.2-AW) under the Contaminated Sites Regulation for compliance. The following surface water sites meet the definition of a constructed ditch:

- SW-US (April)¹
- SW22-03

The effluent leak from the exfiltration treatment lagoon, SW22-05, was also compared to the CSR-AW. Exceedances to surface water quality were limited to the fall sampling event and are detailed in Table 1.

The upgradient site (SW-US) had numerous exceedances, with analytes often in greater concentration than those of the down gradient surface water sites. This site represents a narrow drainage that is fed from a small wetland and flows into the northern perimeter drainage ditch. Exceedances may be attributed to the sites low pH, which increases the dissolution of metals into soluble form. Due to the low pH of this site, analytical results may not represent true background conditions for the down gradient surface water sites.

Dissolved aluminum exceeds the guidelines at each site down gradient. The low pH of the background site makes it difficult to distinguish if elevated dissolved aluminum is due to background conditions, as indicated in the upstream site, or if it is from landfill influence. Historical trends for dissolved aluminum prior to 2022 are not available as dissolved metals had not been included in surface water analysis until this year.

¹ April 2022 sampling of this watercourse was from the constructed ditch that runs from west to east along the north end of the landfill, and not from the small tributary that flows into the constructed ditch.

SW22-03 exceeded the BCWQG-AW for total manganese but did meet the criteria for Schedule 3.2-AW. SW22-04, directly downstream from SW22-03 met the criteria of the BCWQG-AW at the tenure boundary, with the exception of dissolved aluminum.

The seepage from the exfiltration treatment lagoon leak (SW22-05) exceeded the BCWQG-AW for dissolved and total iron, and total manganese.

There were no exceedances to the CSR-AW standards for surface water.

Groundwater

The Schedule 3.2-AW standards apply to groundwater that is within 500 metres upland of aquatic receiving environment. Schedule 3.2 – Drinking Water standards do not apply to the site because the geological units below the site do not meet the definition of a drinking water aquifer (SHA 2022), and because there are no drinking water wells within 500 metres of the site.

All groundwater monitoring well results for the site were compared to Schedule 3.2-AW. There were no exceedances to the groundwater standards in April or October of 2023.

Table 1 Surface Water Exceedances at Meziadin Landfill

Site	Parameter	Acute or Chronic	Result mg/L	BCWQG-AW mg/L	CSR-AW	Dates of Exceedance
SW-US (April) (Up Gradient, Constructed Ditch)	Aluminum, Dissolved Copper, Dissolved Silver, Dissolved Alkalinity pH (lab)	Chronic Acute Acute Chronic Chronic	0.0495 0.00555 0.000105 14.6 6.13	0.025 0.00029 0.0001 20 6.5-9	No Exceedances	April April April April April
SW-US (October) (Up Gradient)	Aluminum, Dissolved Cadmium, Dissolved Copper, Dissolved Alkalinity pH (lab)	Acute Chronic Chronic Chronic Chronic	0.412 0.00003500 0.00150 3.5 6.2	0.059 0.00003271 0.00031 20 6.5-9		October October October October October
SW-DS* (Down Gradient, Tributary to Nass River, Off Tenure)	Aluminum, Dissolved Alkalinity	Acute Chronic	0.216 14.6	0.100 20		October October
SW-03 (Exfiltration Treatment Lagoon, Constructed Pond, Permitted)	Standards and Guidelines Do Not Apply to Surface Water of Constructed Ponds					
SW22-01 (Down Gradient, Tributary to Meziadin River)	Aluminum, Dissolved Iron, Dissolved Alkalinity Zinc Total	Acute Acute Chronic Chronic	0.126 0.464 5.6 0.0084	0.100 0.35 20 0.0075		October October October October
SW22-03 (Down Gradient, Tributary to Nass River, Constructed Ditch)	Aluminum, Dissolved Manganese, Total	Chronic Acute	0.0556 1.540	0.050 0.777	No Exceedances	October October
SW22-04 (Down Gradient, Tributary to Nass River, Tenure Boundary)	Aluminum, Dissolved	Chronic	0.0552	0.050		October
SW22-05 (Lagoon Leak)	Ammonia Iron, Dissolved Cobalt, Total Iron, Total Manganese, Total	Chronic Acute Chronic Acute Acute	3.94 7.10 0.00404 9.26 35.5	1.73 0.35 0.00400 1 4.188	No Exceedances	October October October October October

* Sample not obtained in April due to iced over conditions

Corrective Action to be Taken

The RDKS has drafted a Request for Proposals (RFP) for design and engineering of leachate treatment works for the Meziadin landfill, including an environmental review of the site and repairs to the exfiltration treatment lagoon. The RDKS anticipates that the work will be awarded in early 2023, with construction taking place in the summer and fall of 2024, pending any environmental permits or authorisations that may be required.

The RDKS will continue to monitor the additional surface water monitoring sites that were established in 2022 and will continue to include the analysis of dissolved metals for surface water. During the next sampling event in 2023, an additional background site with neutral pH will be selected and added to the monitoring program to provide a better reflection of background conditions and to assist in determining if dissolved aluminum concentrations in the down gradient surface water sites are from landfill influence or natural conditions. Reporting from the Environmental Review included in the RFP will provide recommendations to improve and enhance the sampling and monitoring program and will include surface water sites from within both the Meziadin River and Nass River watersheds. The RDKS aims to request an amendment to the EEMP for the OC based on the recommendations of the Environmental Review.

Prepared by:



Nicole Lavoie, B.Tech., A.Ag.
Environmental Services Coordinator
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
nlavoie@rdks.bc.ca

Reviewed by:



Erin Blaney, B.Sc.
Solid Waste Manager
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
eblaney@rdks.bc.ca

References:

BC Ministry of Environment. (2016). *Fact Sheet Water Quality Guidelines: Long-Term Average vs. Short-Term Maximum Water Quality Guidelines*. BC Ministry of Environment.

British Columbia Ministry of Environment and Climate Change Strategy. (2017). *Technical Guidance on Contaminated Sites 15 Version 2*. British Columbia Ministry of Environment and Climate Change Strategy. Retrieved from <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/technical-guidance/tg15.pdf>

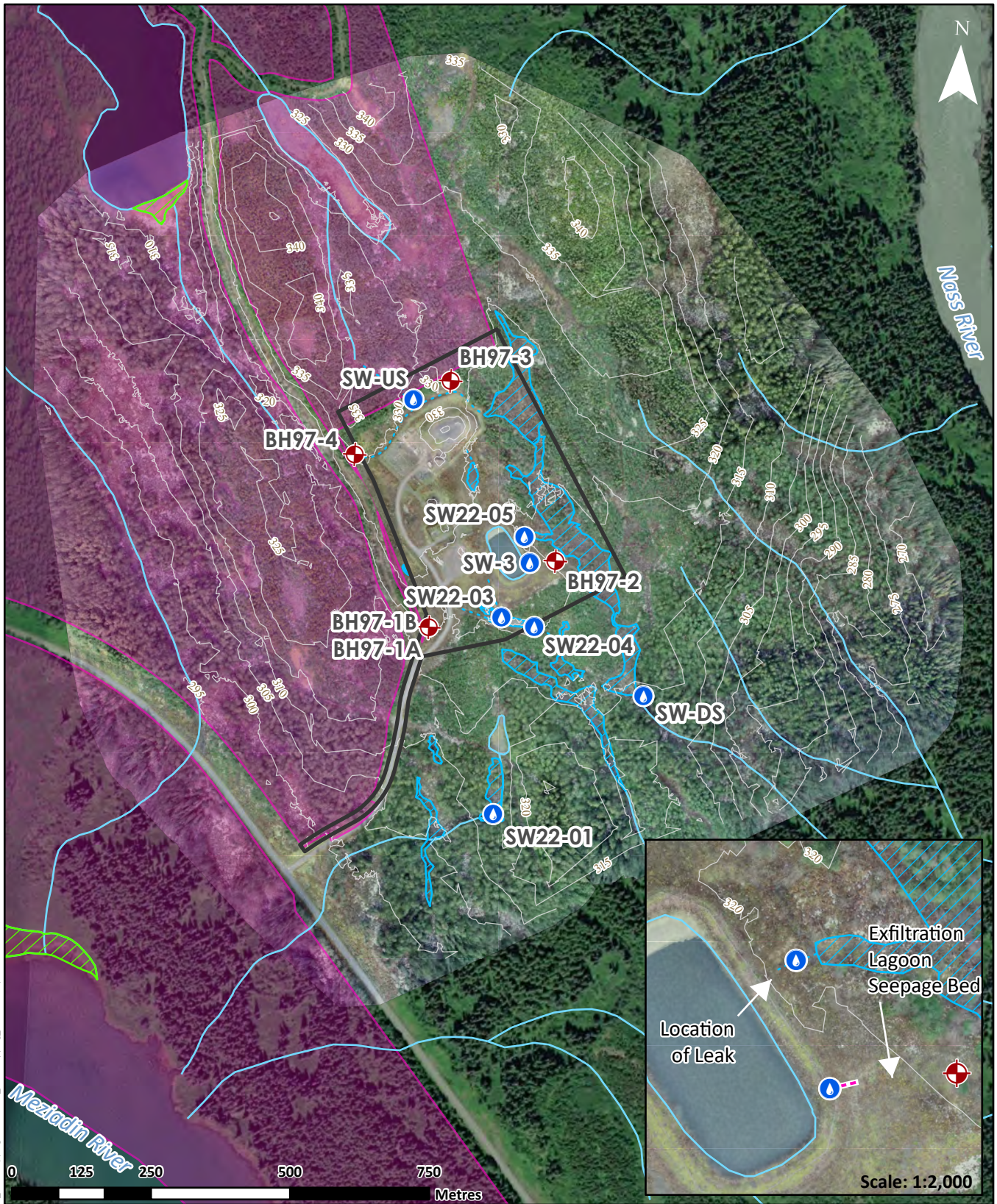
British Columbia Ministry of Environment and Climate Change Strategy. (2021). *British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary*. *Water Quality Series, WQG-20*. Victoria: Province of BC.

British Columbia Ministry of Environment and Climate Change Strategy. (2021). *Procedure 8: Definitions for Contaminated Sites Version 4*. British Columbia Ministry of Environment and Climate Change Strategy. Retrieved from <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/procedures/procedure08.pdf>

Province of British Columbia. (2021). Contaminated Sites Regulation BC Reg 375/96.

Sperling Hansen Associates. (2022). *Meziadin Landfill 2021 Annual Monitoring Report*.

Wilp Wii Litsxw. (2022). *Wilp Wii Litsxw Meziadin Indigenous Protected Area Management Plan*. Wilp Wii Litsxw Gitanyow Chiefs. Retrieved from https://www.indigenousguardianstoolkit.ca/sites/default/files/2022-07/meziadin_ipa_management_plan_june_2022.pdf



Esri, NASA, INGA, USGS, Esri, HERE, Garmin, FourSquare, METI/NASA, USGS, Maxar, Orthoimagery October 2022, Data BC 1:5000 TRIM Watercourse and Contour Lines, N:\Works & Services\Solid Waste\Waste Mapping\Solidwaste_basemapping_20220518.aprx











Project:

Meziadin Landfill DRAFT



**Regional District of
Kitimat-Stikine**
 Suite 300 - 4545 Lazelle Avenue
 Terrace, B.C. V8G 4E1

Legend:

-  Monitoring Well
-  Surface Water Site
-  Contour (5m)
-  Exfiltration Pipe
-  Mapped Watercourse (2022 Orthoimagery)
-  Watercourse
-  Hanna-Tintina Conservancy Area
-  Mapped Surface Water (2022 Orthoimagery)
-  Tenure Lease
-  Wetland

Title:

Environmental Monitoring Locations

Scale: 10,000	Projection: NAD 1983 UTM Zone 9N
File: 5360-03-05-05	Date: Dec 7, 2022
Drawn: N. Lavoie Reviewed: E. Blaney	Figure No: 1



Our File No. 5360 03 03 02 05

To: EnvironmentalCompliance@gov.bc.ca

From: Regional District of Kitimat-Stikine (RDKS)
300-4545 Lazelle Avenue, Terrace BC, V8G 4E1
Enviro.Dept@rdks.bc.ca

Date: November 16, 2022

Re: **Non-Compliance Report for MR-17226 – Soil and Water Quality Exceedances**

Location: Hazelton Waste Management Facility, Surface Water Sites

Nature of Non-compliance:

Hazelton Waste Management Facility (WMF), operated under Operational Certificate (OC) 17226, carries out a leachate, soil, surface water, and groundwater monitoring program in compliance with the prescribed Environmental Effects Monitoring Program (EEMP).

Under the EEMP, Leachate is sampled from the weir at Wetland 4, a composite soil sample is collected from the phytoremediation orchard, surface water sites include wetlands and watercourses surrounding the landfill are sampled and monitored, and shallow and deep groundwater wells are sampled and monitored (Appendix A).

The monitoring and sampling program is completed three times per year for surface water sites, once each in the Spring, Summer, and Fall; and annually for groundwater and phytoremediation soil. Discharge from Wetland 4 is monitored regularly throughout the year and compared to criteria within the Operational Certificate (OC).

Exceedances during the 2022 year include an exceedance to soil criteria at the phytoremediation orchard, an exceedance to discharge criteria at Wetland 4, exceedances to surface water criteria, and exceedances to groundwater criteria. The exceedance response plan for surface water (exceedances to SW-09) was not triggered. The exceedance response plan for groundwater was triggered due to exceedances at SGW-04, SGW-05, and BH-5B, but was not initiated.

Soil

A composite soil sample was collected from the phytoremediation orchard prior to discharge, on March 3, 2022. The sample was compared to the BC Contaminated Sites Regulation (CSR) for industrial land use. The concentration of total arsenic in March 2022 was 13.8 mg/L. An exceedance was noted for total arsenic to the groundwater flow used by aquatic life standard, which is 10 mg/L.

Prior to discharge to the phytoremediation stands, effluent from Wetland 4 and/or the Sand Filter is sampled against the criteria of the OC. The OC criteria does not include an acceptable concentration of arsenic. Total arsenic concentrations at Wetland 4 and the Sand Filter consistently exceed the chronic guidelines for aquatic life but were not required to meet the chronic guidelines.

The topsoil material that the phytoremediation orchards were constructed from was sourced from within the WMF site. Arsenic levels at the phytoremediation stand have exceeded the arsenic criteria for groundwater flow used by aquatic life since sampling began in 2018, where the average concentration of total arsenic in the soil was 11.8 mg/L. Background soil sampling was not completed to determine if arsenic levels in the phytoremediation orchard soils are naturally occurring or from anthropogenic influence.

Vegetative uptake of arsenic from the phytoremediation stand is assumed to be minimal due to the poor growth of the trees. Approximately 490 additional trees were planted in the phytoremediation orchard in 2022. Successful establishment of these trees in the phytoremediation orchard is expected to assist in remediating arsenic from leachate discharge and soil.

Discharge

Total iron at Wetland 4 on August 18, 2022, was 5.55 mg/L which exceeded the OC criteria of 4.5 mg/L. There are no recorded total iron exceedances at this location. This result may be an anomaly.

Groundwater

Groundwater wells were sampled on the following dates:

- June 2, 2022 (Summer) – Shallow groundwater wells only
- October 18, 2022 (Fall)

Shallow groundwater wells were compared to both the surface water criteria, and the groundwater criteria. In the 2021 EEMP report, groundwater was compared against the surface water criteria as well as the groundwater criteria. In 2022 an additional round of shallow groundwater sampling was included in the program in June to provide an additional season of sampling. Groundwater exceedances are presented in Table 1.

Table 1 Groundwater Exceedances in 2022 at Hazelton Waste Management Facility

Site	Parameter	Result mg/L	CSR -DW mg/L	Dates of Exceedance
SGW-04 (Down Gradient)	Cobalt Dissolved Manganese Dissolved	0.00212; 0.00444 2.50	<=0.001 <1.5	June and October October
SGW-05 (Down Gradient)	Cobalt Dissolved	0.00632	<=0.001	October
BH-5B (Down Gradient)	Cobalt Dissolved Manganese Dissolved Chloride	0.00488 4.37 297	<=0.001 <1.5 <250	October October October

Cobalt and Manganese exceeded the criteria at the downstream wells SGW-04 and SGW-05. Cobalt has been observed in downstream and upstream wells in the historical data without an increasing trend. The review of groundwater data in 2021 EEMP Report inferred cobalt to be of similar concentration upstream as was observed downstream (WSP Golder, 2022). The 2022 data does not include any exceedances to cobalt in upstream wells, however, cobalt concentrations in the downstream wells are lower in 2022 than they were in 2021, which supports the conclusion that there is not a trend of increasing concentration downstream and that the exceedances are not attributed to a WMF influence.

Chloride at BH-5B has increased in 2022 compared to historical data. The last exceedance at this location was in the fall of 2016, prior to environmental upgrades at the site. The 2021 EEMP report suggested that road influence in addition to landfill influence may be responsible for increases to chloride concentrations at the site. Chloride concentrations in riverine environments vary seasonally, with highest concentrations typically observed when flows are lowest, usually in the fall and winter (Situ, 2018). The chloride at this location is higher than chloride levels in any other groundwater monitoring wells and is the only chloride exceedance in 2022, however chloride levels in SGW-02 and SGW-04 have increased from fall 2021 to fall 2022. Historical chloride concentrations from BH-5B are included in Figure 1.

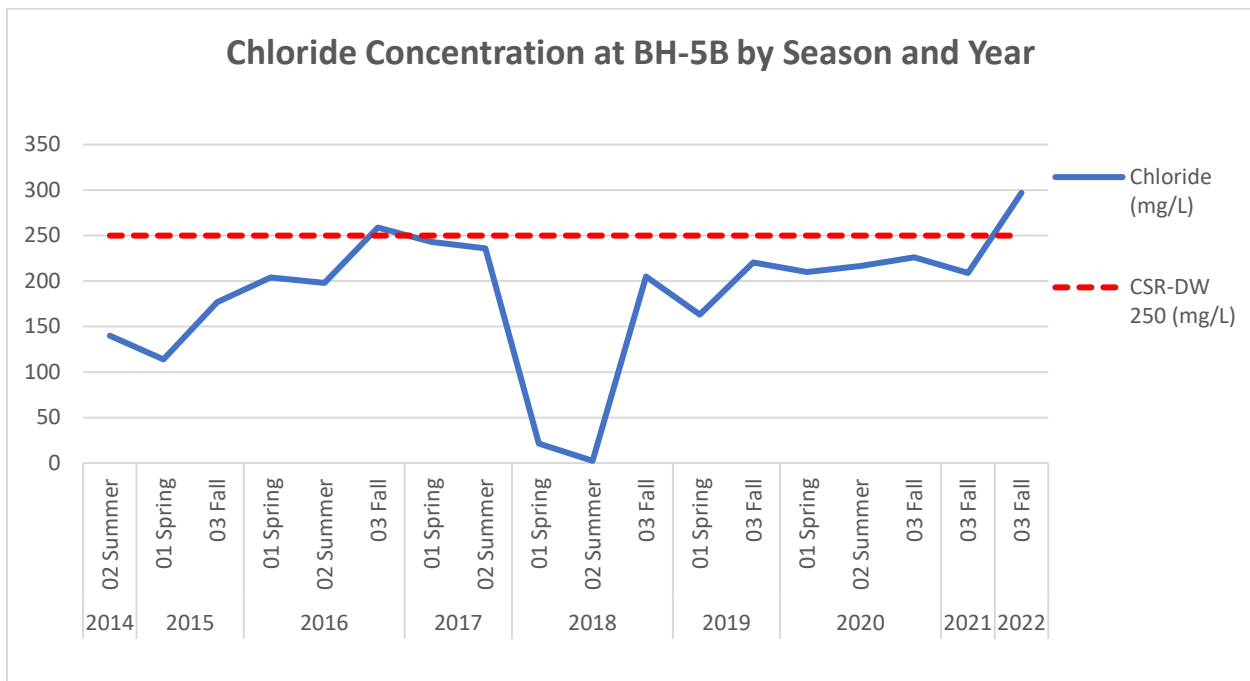


Figure 1: Chloride Concentrations at BH-5B by Season and Year

The exceedance response plan was not initiated following the exceedance of chloride at BH-5B. It is suspected that concentrations at this location are partially attributed to road influence from road salts applied during the winter months. The groundwater exceedance response plan requires the RDKS to stop discharging into Wetland 1 and recirculate leachate back into the sedimentation pond and deploy aerators. The goal of the exceedance response plan is to reduce ammonia and BOD levels. Ammonia concentrations at these wells did not exceed the criteria.

Chloride reduction in wastewater treatment typically uses chemical additives to precipitate or adsorb chloride ions. Chloride reduction is not achieved through increased aeration and retention times. Chloride concentrations of leachate discharged from the site at Wetland 4 did not exceed the criteria of the OC (3,750 mg/L). In addition to meeting the criteria of the OC, chloride concentrations of discharged leachate meet the BC WQG for drinking water and aquatic life.

Because the exceedance response plan was not designed for chloride reduction, and because chloride concentrations in the effluent did not exceed the regulatory criteria, the exceedance response plan was not initiated.

Surface Water

Surface water, and shallow groundwater analytical data was compared to the Working and Approved British Columbia Water Quality Guidelines for aquatic wildlife (BCWQG-AW). Drinking water quality guidelines were not applied due to the site being greater than 1 kilometre away from any surface drinking water sources (WSP Golder, 2022).

The BCWQG-AW includes short-term maximum (acute) and long-term average (chronic) criteria. Results are compared to both the acute and chronic criteria. Sites where only the chronic criteria is exceeded may serve as an alert to increase the sampling frequency (BC Ministry of Environment, 2016).

Surface and shallow groundwater wells were sampled on the following dates:

- May 17, 2022 (Spring)
- June 2, 2022 (Summer)
- August 5, 2022 (Summer)
- October 18, 2022 (Fall)

Shallow groundwater wells have historically been tested for only dissolved metals, and sampled once per year as required by the OC. In the 2021 Annual Report for HWMF, shallow groundwater wells were also compared to the BCWQG-AW, which requires total and dissolved metals be tested for a full comparison. Total metals were added to the analysis in the 2022 sampling date of October 18, 2022, resulting in two sampling events for all shallow groundwater wells, one in Summer including dissolved metals, and one in Fall including total and dissolved metals. Surface water exceedances are presented in Table 2.

Alkalinity exceeded the acute criteria at up gradient site SW-01 and down gradient site SW-05. Historical data for the site has demonstrated a fluctuation of alkalinity above and below the criteria at several up gradient and down gradient sites. The review of the data in the 2021 EEMP report concluded that fluctuations in alkalinity were not due to a WMF influence (WSP Golder, 2022).

Dissolved aluminum exceedances to the acute criteria were observed at up gradient site SW-01, and down gradient sites SW-05 and SW-07. Dissolved aluminum has exceeded the criteria in historical data, with new trends of increasing concentrations or discernable differences between up gradient and down gradient sites. The review of the data in 2021 EEMP Report concluded that dissolved aluminum exceedances were not due to a WMF influence.

Dissolved iron exceedances were observed at all surface water and shallow groundwater locations in 2022. This was also observed during the review of the data in the 2021 EEMP Report. This review concluded that these exceedances were not due to a WMF influence.

Total arsenic exceeded the chronic criteria at down gradient sites SGW-02 and SGW-04, and at upgradient site SW-02. Total arsenic has not exceeded the criteria for surface water in recent years.



Arsenic was not detected in significant levels in SW-07, down stream of the two shallow groundwater wells. Arsenic was also detected in the composite soil sample taken from the phytoremediation orchard and in effluent at Wetland 4.

Table 2 Surface Water Exceedances in 2022 at Hazelton Waste Management Facility

Site	Parameter	Acute or Chronic	Result mg/L	BCWQG-AW mg/L	Dates of Exceedance
SGW-02 (Down Gradient)	Iron Dissolved	Chronic	0.514; 1.110	0.350	June and October
	Arsenic Total	Acute	0.006	0.005	October
	Iron Total	Acute	3.1	1.0	June and October
SGW-04 (Down Gradient)	Iron Dissolved	Chronic	2.660; 4.050	0.35	June and October
	Arsenic Total	Chronic	0.028	0.005	October
	Cobalt Total	Chronic	0.007; 0.021	0.004	June and October
	Iron Total	Acute	40.6	1.0	October
	Manganese Total	Chronic	3.300	2.119	October
	Mercury Total	Chronic	0.00005; 0.00016	0.00001	June and October
	Toluene	Chronic	0.90	0.50	October
SGW-05 (Down Gradient)	Iron Dissolved	Chronic	0.944; 1.650	0.350	June and October
	Arsenic Total	Chronic	0.033	0.005	October
	Cobalt Total	Chronic	0.037	0.004	October
	Iron Total	Acute	291	1.0	October
	Lead Total	Chronic	0.027	0.013	October
	Manganese Total	Acute	4.450	3.141	October
	Mercury Total	Chronic	0.00025	0.00001	October
	Zinc Total	Acute	0.195	0.117	October
SW-01 (Up Gradient)	Alkalinity	Acute	19	20	October
	Aluminum Dissolved	Acute	0.104; 0.160; 0.233	0.100	May, August, and October
	Iron Dissolved	Chronic	0.829; 3.810	0.350	August and October
	Arsenic Total	Acute	0.007	0.005	August
	Cobalt Total	Chronic	0.014	0.004	August
	Iron Total	Acute	25.6; 4.7	1.0	August and October
	Manganese Total	Acute	2.460	0.792	August
	Silver Total	Acute	0.00007	0.00005	August
	Toluene	Chronic	1.570	0.500	August
SW-02 (Up Gradient)	Iron Dissolved	Chronic	0.437; 5.400	0.350	August and October
	Arsenic Total	Acute	0.006	0.005	October
	Iron Total	Acute	1.1; 18.5	1.0	August and October
	Zinc Total	Acute	0.057	0.019	October
	Toluene	Chronic	3.690	0.500	October
SW-05 (Down Gradient)	Alkalinity	Acute	18	20	May
	Aluminum Dissolved	Chronic	0.157; 0.103	0.100	May and August
	Iron Dissolved	Chronic	0.764; 0.563	0.350	August and October
SW-07 (Down Gradient)	Aluminum Dissolved	Acute	0.134	0.100	June

Total cobalt has exceeded the chronic guideline at SGW-04 and SGW-05. Cobalt exceedances to the CSR were observed during the review of data in the 2021 EEMP Report. This review concluded that cobalt has been observed in exceedance of the CSR in the groundwater wells, was observed in similar concentrations in the shallow groundwater wells, and that no trend in increase has been observed since the time of record (2014). These exceedances were presumed to be due to naturally occurring processes unrelated to the WMF.

Total Iron has exceeded the acute criteria in every sample site except down gradient sites SW-05 and SW-07. This trend was also observed in 2021, and iron was presumed to not be due to WMF influence.

Total Lead has exceeded the chronic guideline in down gradient site SGW-05. Total lead has not exceeded the criteria at this location since the time of record. It is presumed that this may be an anomaly in the dataset.

Total manganese has exceeded the chronic guideline in down gradient monitoring well SGW-05, and the acute guidelines in down gradient sites SGW-04 and upgradient site SW-01. Manganese was observed to exceed the CSR limits in SGW-04 and SGW-05 in 2021. Exceedances to manganese on site was presumed to be due to the release of manganese from native sediments on site, and not due to a WMF influence.

Total mercury has exceeded the chronic guidelines at down gradient monitoring wells SGW-04 and SGW-05. Total mercury has not been sampled at this location historically, but dissolved mercury concentrations at these locations have not triggered any exceedances and have not been detected in the down gradient site SW-07.

Total silver and Total zinc exceeded the criteria at upgradient sites. It is presumed that these may be due to the proximity of these sites to the Hazelton Rifle Range and may not be due to a WMF influence.

Toluene exceeded the chronic criteria in upgradient sites SW-01 and SW-02 and was detected in down gradient site SGW-04. Toluene at SGW-04 was also observed in 2020 in exceedance of the BCWQG-AW. Toluene was not detected in down gradient site SW-07. Toluene may occur naturally in wetlands and bogs in the absence of benzene, ethylbenzene and xylene. Given the absence of these constituents in the same sample, the toluene is believed to be of biogenic origin (Sandau, 2017).

Shallow groundwater wells are to be interpreted with caution due to the stagnant nature of these wells, they may not provide an accurate representation of groundwater emanating from the site (WSP Golder, 2022). The recommendations of the 2021 EEMP Report included removal of the shallow groundwater wells from the sampling program due to shallow groundwater wells in ephemeral streams and wetlands not providing an accurate representation of shallow groundwater conditions due to the collection of stagnant water.

Action to be Taken

Composite Phytoremediation Soil

Additional composite soil samples will be taken from offsite locations up gradient of the WMF in 2023 to investigate if arsenic is naturally occurring in the native soils.

Surface Water

Exceedances at shallow groundwater wells are interpreted with caution and will be monitored for trend in the 2022 Environmental Effects Annual Report. Arsenic, lead, mercury and toluene levels will continue to be monitored at the shallow groundwater wells and for detection at downstream sites.

If toluene concentrations demonstrate a trend of increasing concentration chromatographic analysis for m/p/o-cymenes will be completed to further determine if toluene is biogenic or from petroleum origins (Sandau, 2017).

A review of the Environmental Effects Monitoring Program, and a site wide water balance, is to be completed in 2023. The RDKS intends to request that the shallow groundwater wells be removed from

the sampling program as per recommendations from the 2021 EEMP report, and to have the monitoring sites revised to provide a more robust program to characterise surface water and groundwater impacts at and around the WMF.

An additional background surface water site will be sampled in 2023 that is located in an area that is not influenced by the landfill or rifle range to provide additional background data to compare downstream water quality to.

Groundwater:

The exceedance response plan will be evaluated and revised in 2023. Chloride levels at site will continue to be monitored. The RDKS will seek recommendations in the review of the Environmental Effects Monitoring Program to improve the chloride monitoring in surface and groundwater, and to establish monitoring sites away from the highway right-of-way.

Prepared by:



Nicole Lavoie, B.Tech., A.Ag.
Environmental Services Coordinator
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
nlavoie@rdks.bc.ca

Reviewed by:



Erin Blaney, B.Sc.
Solid Waste Manager
Regional District of Kitimat-Stikine
300 – 4545 Lazelle Avenue
Terrace, BC V8G 4E1
eblaney@rdks.bc.ca



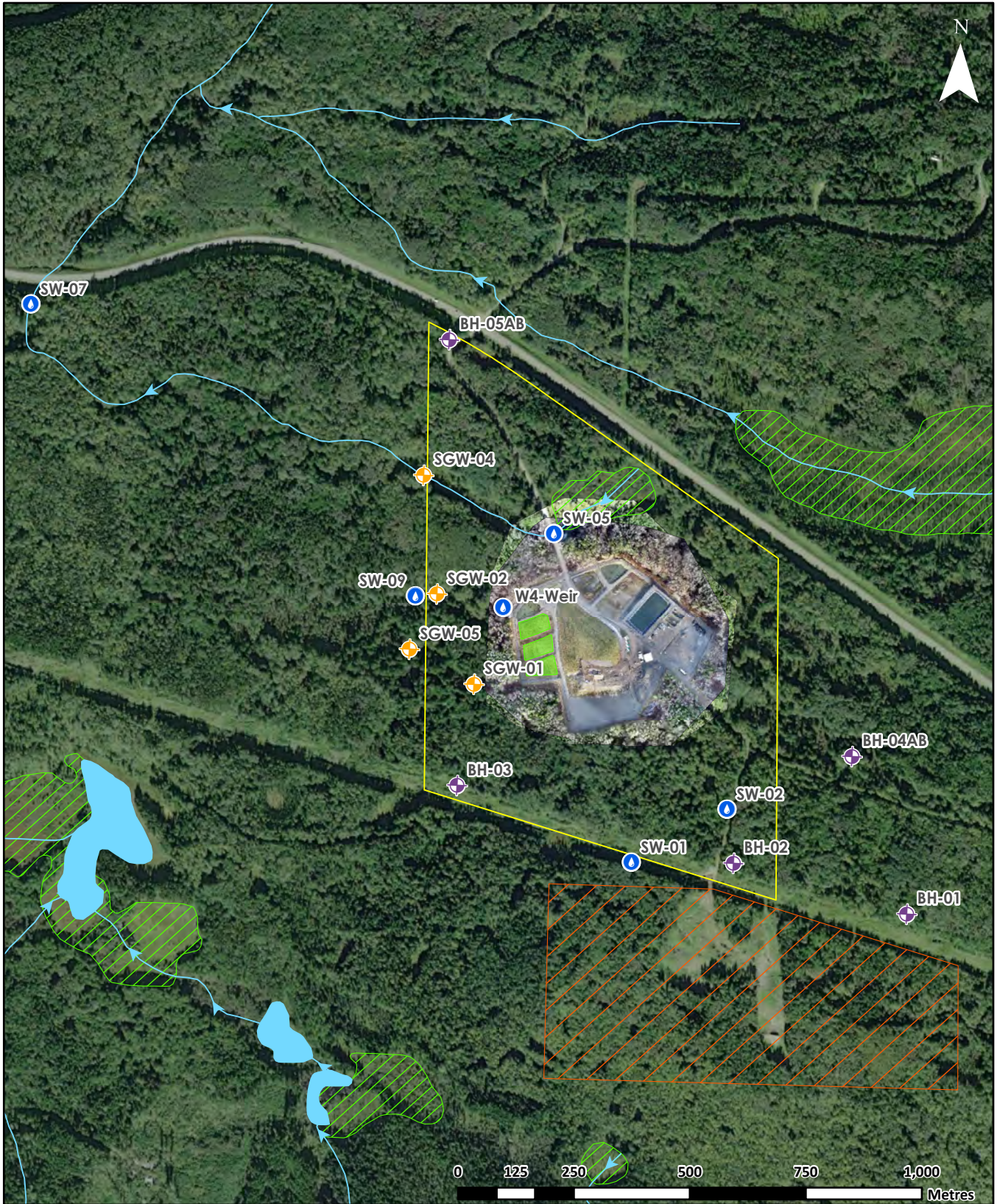
References:

BC Ministry of Environment. (2016). *Fact Sheet Water Quality Guidelines: Long-Term Average vs. ShortTerm Maximum Water Quality Guidelines*. BC Ministry of Environment.

Sandau, C. (2017). Where Does Toluene Come From? - Petrogenic families and biogenic loners. *AGAT Science and Technology Talks*. Retrieved from <https://chemistry-matters.com/slideshare/where-does-toluene-come-from-agat-science-and-technology-talks-2017/>

Situ, Q. (2018). *Seasonal and Temporal Variations of Chloride Level in Riverine Environment*. Calgary: University of Calgary.

WSP Golder. (2022). *Hazelton Waste Management Facility Environmental Effects Monitoring Report*. WSP Golder.



Esri, NASA, INGA, USGS, Esri, HERE, Garmin, FourSquare, METI/NASA, USGS, Maxar, N:\Works & Services\Solid Waste\Mapping\SolidWaste_basemapping\solidwaste_basemapping_20220518.aprx










Project:

Hazelton Landfill Non-Compliance Reporting



**Regional District of
Kitimat-Stikine**
 Suite 300 - 4545 Lazelle Avenue
 Terrace, B.C. V8G 4E1

Legend:

	Surface Water Site		Tenure Lease
	Groundwater Monitoring Well		Watercourse
	Shallow Ground Well		Waterbody
	Phyto Orchard		Wetland
	Rifle Range Licence of Occupation		

Title:

Environmental Effects Monitoring Locations

Scale: 12,000	Projection: NAD 1983 UTM Zone 9N
File: 5360-03-03-02-05	Date: Nov 16, 2022
Drawn: N. Lavoie Reviewed: E. Blaney	Figure No Appendix A

Appendix D Historical Data Tables



Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Field												
Conductivity	µS/cm				-	-	-	-	-	-	-	395
pH	pH units				-	-	-	-	-	-	-	7.8
Temperature	°C				-	-	-	-	-	-	-	6.7
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-	-	-
Depth to Water	m				-	-	-	-	-	-	-	21.08
Analyte												
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		<0.005	-	-	-	-	-	-	-
Cyanide, total	mg/L				-	<0.010	<0.010	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-		>1250	210	210.0	220.0	220.0	220.0	220	220
Dissolved Hardness (CaCO3)	mg/L	-	500		148	158	165	-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-	171	154	175	149	158
Bromide	mg/L				-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	<1.0	2.2	5.5	3.3	3.5	14.7	3.5	2.4
Fluoride	mg/L				-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	9.4	<1.0	<1.0	<1.0	<1.0	<1.0	1	<1.0
Conductivity	uS/cm	-	700		464	387	404	394	396	428	404	400
Specific Conductance	uS/cm				-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.07	<0.03	0.064	0.08	<0.03	<0.03	<0.03	<0.03
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.033	0.040	0.370	0.210	0.460	0.220	0.189	0.018
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	<0.01	0.014	<0.01	0.01	<0.01	<0.01
Nitrate+Nitrite (N)	mg/L				-	0.041	0.373	0.224	0.219	0.23	0.189	0.018
Total Kjeldahl Nitrogen (N)	mg/L	-			0.607	<0.5	0.370	-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01		21.9	0.2	0.2	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		43,000	72	72	-	-	-	-	-
Total Dissolved Solids	mg/L				289	190	220	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.9	8.1	8.1	8.2	8.1	8.2	8.1	8.4
Volatiles												
Benzene	ug/L	40 (a)	5 (a)		<0.4	-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		<0.4	-	-	-	-	-	-	-
Xylene, m+ and p-	µg/L				-	-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-	-
Vinyl chloride	ug/L				<0.50	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-		<2.0	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		<0.5	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	-
Hydrocarbons												
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-	-
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	-
Misc. Organics												
Chemical Oxygen Demand	mg/L	-	-		471	33	<20	<20	<20	<20	<20	<20
Biochemical Oxygen Demand	mg/L				-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				0.69	1.00	2.60	-	-	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-	-	-	-
Phenols	mg/L	0.05			<0.001	-	-	-	-	-	-	-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0190	0.0050	<0.005	0.0150	0.0070	0.0150	<0.0050	0.0075
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00058	0.00060	<0.0001	0.00010	0.00010	0.00030	<0.00010	0.00021
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00053	0.00180	0.00160	0.00210	0.00160	0.00200	0.00160	0.00181
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.320	0.212	0.262	0.242	0.218	0.243	0.1970	0.2370
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.066	0.069	0.065	0.069	0.076	0.072	0.073	0.065
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	<0.00001	0.0002	0.00068	0.00003	0.0009	0.00099	0.000239	0.000365
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	18	18	20	20	20	20	18	20
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.00050	<0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.0050	<0.00005	0.00011	<0.00005	<0.00005	0.0001	<0.00010	<0.00010
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	<0.0050	0.0024	0.0023	0.0014	0.0029	0.0048	0.00213	0.00137
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.01	<0.010	<0.010	0.019	<0.010	<0.010	<0.010	0.021
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0002	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.00010	<0.00010
Dissolved Lithium (Li)	mg/L				<0.005	0.0003	0.0003	0.0003	0.0004	0.0004	0.0005	0.0003
Dissolved Magnesium (Mg)	mg/L	-	700	-	25.3	27.3	28.4	29.1	25.5	30.6	25.2	26.3
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0363	0.1280	0.0026	0.0999	0.0009	0.0069	0.0015	0.0926
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00001	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0095	0.0027	0.0100	0.0100	0.0100	0.0107	0.0097	0.0095
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	<0.001	0.0016	0.0012	0.0004	0.0018	0.0047	0.00053	0.00084

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			BH 1 - E251512								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	31-Aug-17	30-May-18	11-Jul-18	11-Sep-18	17-Apr-19	13-Aug-19	13-Aug-19	20-Nov-19	
Date					Sample	Sample	Sample	Sample	Sample	DUP	Sample	Sample	
Field													
Conductivity	µS/cm				400	383	526	463	472	455	-	358.8	
pH	pH units				7.7	-	-	-	7.89	7.32	-	7.05	
Temperature	°C				7.4	6.4	6.5	6.5	6.3	6.8	-	6.4	
Dissolved Oxygen	mg/L				-	-	-	-	3	5.4	-	2	
ORP	mV				-	-	-	-	335.4	271.1	-	443.6	
Depth to Water	m				21.07	21.1	21.05	21.05	22.72	21.17	-	21.07	
Analyte													
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		-	-	-	-	-	-	-	-	
Cyanide, total	mg/L	-	-		-	-	-	-	-	-	-	-	
Alkalinity (CaCO ₃)	mg/L	-	-		-	276	379	392	392	326	309	325	
Dissolved Hardness (CaCO ₃)	mg/L	-	500		-	-	-	-	-	-	-	-	
Hardness, Total (Total as CaCO ₃)	mg/L	-	-		-	266	270	329	266	265	318	260	
Bromide	mg/L	-	-		-	-	-	-	-	-	-	<0.050	
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	0.7	0.6	<2.5	<0.50	<0.050	<0.50	0.074	
Fluoride	mg/L	-	-		-	-	-	-	0.083	0.074	0.075	0.0092	
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	15.4	18.2	27.7	13.9	14.4	14.7	13.5	
Conductivity	uS/cm	-	700		-	-	-	-	-	-	-	537	
Specific Conductance	uS/cm	-	-		-	-	-	-	-	-	-	-	
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		-	0.426	0.314	0.297	0.365	0.276	0.271	0.72	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	<0.0050	0.025	<0.025	<0.0050	<0.0050	<0.0050	0.0306	
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	<0.0010	0.0026	<0.0050	<0.0010	<0.0010	<0.0010	0.0227	
Nitrate+Nitrite (N)	mg/L	-	-		-	<0.0060	0.0276	<0.030	-	-	-	-	
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-	-	-	-	-	-	-	6.5	
Total Phosphorous (P)	mg/L	-	0.01		-	-	-	-	-	-	-	-	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/L) (i)	-		-	-	-	-	-	-	-	-	
Total Dissolved Solids	mg/L	-	-		-	-	-	-	-	-	-	-	
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-	8.36	-	8.38	8.37	8.4	
Volatiles													
Benzene	ug/L	40 (a)	5 (a)		-	<0.00050	-	-	-	-	-	-	
Ethylbenzene	µg/L	-	-		-	-	-	-	-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L	-	-		-	-	-	-	-	-	-	-	
Styrene	µg/L	-	-		-	-	-	-	-	-	-	-	
Toluene	ug/L	0.5 (a)	-		-	0.00058	-	-	-	-	-	-	
Xylene, m+ and p-	µg/L	-	-		-	-	-	-	-	-	-	-	
Xylene, o-	µg/L	-	-		-	-	-	-	-	-	-	-	
Xylenes, total	µg/L	-	-		-	-	-	-	-	-	-	-	
BTEX+Styrene, total	µg/L	-	-		-	-	-	-	-	-	-	-	
Vinyl chloride	ug/L	-	-		-	<0.00040	-	-	-	-	-	-	
Dichloromethane	ug/L	98.1	-		-	<0.0050	-	-	-	-	-	-	
1,4-dichlorobenzene	ug/L	26	-		-	<0.0010	-	-	-	-	-	-	
Volatile Organic Compounds Surrogates													
bromofluorobenzene, 4-	%	-	-		-	-	-	-	-	-	-	-	
difluorobenzene, 1,4-	%	-	-		-	-	-	-	-	-	-	-	
Hydrocarbons													
EPH (C10-C19)	µg/L	-	-		-	-	-	-	-	-	-	-	
EPH (C10-C32)	µg/L	-	-		-	-	-	-	-	-	-	-	
EPH (C19-C32)	µg/L	-	-		-	-	-	-	-	-	-	-	
TEH (C10-C30), BC	µg/L	-	-		-	-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L	-	-		-	-	-	-	-	-	-	-	
VPHw	µg/L	-	-		-	-	-	-	-	-	-	-	
Hydrocarbons Surrogates													
bromobenzotrifluoride, 2- (EPH surr)	%	-	-		-	-	-	-	-	-	-	-	
dichlorotoluene, 3,4-	%	-	-		-	-	-	-	-	-	-	-	
Misc. Organics													
Chemical Oxygen Demand	mg/L	-	-		-	605.00	366.00	<20	64	148	134	309	
Biochemical Oxygen Demand	mg/L	-	-		-	-	-	-	-	-	-	-	
Dissolved Organic Carbon (C)	mg/L	-	-		-	-	-	-	-	-	-	-	
Total Organic Carbon	mg/L	-	-		-	-	-	-	3.61	64.4	1.22	737	
Phenols	mg/L	0.05	-		-	-	-	-	-	-	-	-	
Dissolved Metals													
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0049	0.2880	0.0942	0.899	0.0022	5.6	0.0047	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	0.00016	0.00018	<0.00010	0.00021	<0.00010	0.00011	0.00022	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00927	0.00691	0.01650	0.00845	0.00835	0.00977	0.00692	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.1130	0.1810	0.1920	0.138	0.194	0.289	0.140	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.084	0.083	0.11	0.082	0.089	0.1	0.080	
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-	0.0000058	0.0000162	0.0000063	0.000017	<0.0000050	0.000243	2.82E-05	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	47	45	58	46	40.7	57.7	43.9	
Dissolved Cesium (Cs)	mg/L	-	-		-	<0.000010	0	0	0.000073	<0.000010	0.000355	<0.000010	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	<0.00010	0.00031	0.00013	0.00087	<0.00010	0.00647	<0.00010	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	0.00021	0.00042	0.00017	0.00056	0.00011	0.00539	0.00028	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00204	0.00073	0.00094	0.00178	<0.00020	0.0227	0.00047	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	0.217	0.395	0.858	0.903	0.099	9.45	0.196	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	<0.000050	0.000104	0.000091	0.000345	<0.000050	0.00373	<0.000050	
Dissolved Lithium (Li)	mg/L	-	-		-	0.0014	0.0015	0.002	0.0017	0.0012	0.0056	0.0012	
Dissolved Magnesium (Mg)	mg/L	-	700		-	36.1	38.4	44.9	36.6	39.6	42.2	36.4	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	0.1310	0.1590	0.1750	0.169	0.135	0.728	0.470	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.0000050	0.0000131	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.0060	0.0047	0.0034	0.00345	0.00351	0.00176	0.00382	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	<0.00050	0.00085	<0.00050	0.00113	<0.00050	0.0117	<0.00050	

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	31-Mar-20	22-Jun-20	23-Jul-20	25-Aug-20	9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20
Date					Sample	Sample	Monitor	Sample	Monitor	Sample	Monitor	Monitor
Field												
Conductivity	µS/cm				396.6	242.6	524	495	495	403.5	615	720
pH	pH units				7.8	7.6	-	7.31	-	7.52	-	-
Temperature	°C				6.2	6.7	7.1	6.4	6.4	6.3	6.3	6.3
Dissolved Oxygen	mg/L				1.4	3.2	-	3.9	-	1.3	-	-
ORP	mV				222.6	175.3	-	322.1	-	242.6	-	-
Depth to Water	m				21.17	21.45	21.39	21.41	21.39	21.18	21.2	21.17
Analyte												
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	-	2180	322	-	376.00	-	362.00	-	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	267	308	-	338	-	334	-	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	<0.050	-	<0.250	-	<0.050	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	<0.50	<0.50	-	<2.50	-	<0.50	-	-
Fluoride	mg/L	-	-	-	0.063	0.057	-	<0.100	-	0.044	-	-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	15.7	18.1	-	24.70	-	19.00	-	-
Conductivity	uS/cm	-	700	-	580	609	-	687	-	658	-	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	0.574	0.616	-	0.291	-	0.345	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.01	<0.0050	-	<0.0250	-	0.012	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	0.0044	<0.0010	-	0.0081	-	<0.0010	-	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	40.2	113	-	0.324	-	2.68	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	390	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	8.14	8.04	-	8.07	-	7.99	-	-
Volatiles												
Benzene	µg/L	40 (a)	5 (a)	-	-	<0.50	-	<0.50	-	<0.50	-	-
Ethylbenzene	µg/L	-	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Styrene	µg/L	-	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Toluene	µg/L	0.5 (a)	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Xylene, m+ and p-	µg/L	-	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Xylene, o-	µg/L	-	-	-	-	<0.50	-	<0.50	-	<0.50	-	-
Xylenes, total	µg/L	-	-	-	-	<0.75	-	<0.75	-	<0.75	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	<1.5	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	µg/L	98.1	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	µg/L	26	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%	-	-	-	-	89.5	-	94.3	-	90.2	-	-
difluorobenzene, 1,4-	%	-	-	-	-	99.3	-	111	-	93.6	-	-
Hydrocarbons												
EPH (C10-C19)	µg/L	-	-	-	-	<250	-	<250	-	<250	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	<250	-	<250	-	<250	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	<250	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	<100	-	<100	-	<100	-	-
VPHw	µg/L	-	-	-	-	<100	-	<100	-	<100	-	-
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	92.4	-	92.6	-	89	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	83.8	-	98.0	-	87.00	-	-
Misc. Organics												
Chemical Oxygen Demand	mg/L	-	-	-	1370	5180	-	29	-	274	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	404	1200	-	126	-	263	-	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-	-	-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0015	0.0290	-	0.0080	-	0.0051	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00034	<0.00010	-	<0.00010	-	0.00	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	0.00586	0.01210	-	0.00925	-	0.00561	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.159	0.3560	-	0.243	-	0.25	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	<0.000100	-	<0.000100	-	<0.000100	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	-	<0.000050	-	<0.000050	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.091	0.101	-	0.115	-	0.113	-	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	<0.0000050	<0.0000050	-	0.0000053	-	<0.0000050	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	41.9	49	-	62.4	-	58.1	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	<0.000010	<0.000010	-	<0.000010	-	<0.000010	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00010	<0.00010	-	<0.00010	-	<0.00010	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00014	0.00013	-	0.00013	-	0.00042	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	<0.00020	0.00061	-	<0.00020	-	<0.00020	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.175	1.02	-	0.237	-	0.026	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	<0.000050	-	<0.000050	-	<0.000050	-	-
Dissolved Lithium (Li)	mg/L	-	-	-	0.008 ⁽²⁾	0.0021	0.0015	0.0018	-	0.0021	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	39.4	45.4	-	44.2	-	45.8	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.112	0.2070	-	0.109	-	0.135	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	<0.0000050	-	<0.0000050	-	<0.0000050	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00377	0.0031	-	0.00315	-	0.00358	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	<0.00050	<0.00050	-	<0.00050	-	0.00203	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	19-Jan-21	21-Apr-21	16-Jul-21	18-Oct-21	18-Jan-22
Date					Monitor	Monitor	Monitor	Sample	Monitor
Field									
Conductivity	µS/cm				710	522	545	539	315.8
pH	pH units				-	-	-	8.26	7.26
Temperature	°C				6.5	6.5	6.5	6.4	6.4
Dissolved Oxygen	mg/L				-	-	-	2.1	2.6
ORP	mV				-	-	-	264.9	113.9
Depth to Water	m				20.99	21.98	20.97	20.91	22.6
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	-	-	-	-	300	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	-	-	-	245	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	-	-	<050	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	-	-	<0.50	-
Fluoride	mg/L	-	-	-	-	-	-	0.064	-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	-	-	1.25	-
Conductivity	uS/cm	-	700	-	-	-	-	-	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	-	-	<0.0050	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	-	-	<0.0050	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	-	-	<0.0010	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	<0.050	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-	-	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	<0.50	-
Ethylbenzene	µg/L	-	-	-	-	-	-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	<0.50	-
Styrene	µg/L	-	-	-	-	-	-	<0.50	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	2.28	-
Xylene, m+ and p-	µg/L	-	-	-	-	-	-	<0.40	-
Xylene, o-	µg/L	-	-	-	-	-	-	<0.30	-
Xylenes, total	µg/L	-	-	-	-	-	-	<0.50	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%	-	-	-	-	-	-	86.3	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	104	-
Hydrocarbons									
EPH (C10-C19)	µg/L	-	-	-	-	-	-	<250	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	<400	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	<250	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	<100	-
VPHw	µg/L	-	-	-	-	-	-	<100	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	70.8	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	104.00	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	<20	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	0.8	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	0.0026	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	<0.00010	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	0.00147	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	0.467	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	0.097	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-	-	-	0.0000478	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	29.1	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	0.00055	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	<0.010	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	-	-	0.0011	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	41.9	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	0.00202	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	<0.000005	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	0.00226	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	<0.000050	-

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Field												
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.011	<0.02	0.050	0.070	0.040	0.060	<0.050	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	1.83	3.50	2.49	2.05	2.03	2.40	2.01	2.02
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.0001	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
Dissolved Silicon (Si)	mg/L	-	-	-	1.22	9.30	1.10	1.30	1.20	1.30	1.20	1.30
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	0.00023	<0.000050	<0.000050
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	27.2	32.0	35.6	33.0	30.3	41.2	30.5	30.0
Dissolved Strontium (Sr)	mg/L	-	-	-	0.709	0.672	0.682	0.705	0.642	0.761	0.609	0.694
Dissolved Sulphur (S)	mg/L	-	-	-	<3.0	2	<1	<1	2	<1	<3.0	<3.0
Dissolved Tellurium (Te)	mg/L				-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000020	<0.000020
Dissolved Thorium (Th)	mg/L				-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.005	<0.0002	<0.0002	<0.0002	0.0002	0.0002	<0.00020	<0.00020
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00027	0.00004	0.00004	0.00005	0.00005	0.00005	0.00006	0.00006
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.005	0.004	0.027	<0.004	<0.004	0.027	<0.0040	0.0108
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010

Notes:

- 0.3 exceeded the freshwater aquatic life criteria
- 0.3 exceeded the drinking water quality criteria.
- 0.3 both the aquatic life and drinking water criteria.
- 0.3 mg had detection limit exceeding criteria.
- 0.3 detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			BH 1 - E251512							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	31-Aug-17	30-May-18	11-Jul-18	11-Sep-18	17-Apr-19	13-Aug-19	13-Aug-19	20-Nov-19
Date					Sample	Sample	Sample	Sample	Sample	DUP	Sample	
Field												
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	<0.050	<0.050	0.067	<0.050	0.759	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	-	2.01	2.32	1.97	2.17	2.1	2.34	1.83
Dissolved Rubidium (Rb)	mg/L					0.00	0.00	0.00	0.00084	0.0004	0.00179	0.00033
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Silicon (Si)	mg/L	-	-	-	-	4.23	4.60	6.48	5.52	3.77	12	3.78
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000021	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	31.5	30.9	29.8	30.8	30.7	30.1	29.8
Dissolved Strontium (Sr)	mg/L	-	-	-	-	1.120	1.080	1.370	1.19	1.15	1.3	1.05
Dissolved Sulphur (S)	mg/L	-	-	-	-	5.1	6.6	9.3	5.28	4.81	5	4.48
Dissolved Tellurium (Te)	mg/L					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000025	<0.000010
Dissolved Thorium (Th)	mg/L					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00057	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	<0.00010	0.00035	<0.00010	<0.00010	<0.00010	0.00016	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.00030	<0.0063	0.00164	0.0319	<0.00030	0.0642	<0.00030
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.00051	0.00075	0.00105	0.000782	0.000657	0.000785	0.000612
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	<0.00050	0.00084	<0.00050	0.00204	<0.00050	0.0125	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	<0.0010	0.002	0.0026	0.0038	<0.0010	0.0392	<0.0010
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.000060	0.000157	<0.000060	<0.00072	<0.00020	<0.0014	<0.00020

Notes:

- 0.3 exceeded the freshwater aquatic life criteria.
- 0.3 exceeded the drinking water quality criteria.
- 0.3 both the aquatic life and drinking water criteria.
- 0.3 detection limit exceeding criteria.
- 0.3 detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	31-Mar-20	22-Jun-20	23-Jul-20	25-Aug-20	9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20
Date					Sample	Sample	Monitor	Sample	Monitor	Sample	Monitor	Monitor
Field												
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	-	<0.050	-	<0.050	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	2.06	2.33	-	2.05	-	2.32	-	-
Dissolved Rubidium (Rb)	mg/L			-	0.00033	0.00	-	0.00031	-	0.00050	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.000050	<0.000050	-	<0.000050	-	<0.000050	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	3.35	5.17	-	5.71	-	6.15	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	-	<0.000010	-	<0.000010	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	30.1	30.8	-	29.9	-	29.8	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	1.14	1.330	-	1.45	-	1.41	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	3.45	6.7	-	8.17	-	9.63	-	-
Dissolved Tellurium (Te)	mg/L			-	<0.00020	<0.00020	-	<0.00020	-	<0.00020	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	-	<0.000010	-	<0.000010	-	-
Dissolved Thorium (Th)	mg/L			-	<0.00010	<0.00010	-	<0.00010	-	<0.00010	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	-	<0.00010	-	<0.00010	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	0.00045	-	<0.00030	-	<0.00030	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	<0.00010	-	<0.00010	-	<0.00010	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000463	0.00027	-	0.00113	-	0.00130	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	<0.00050	-	<0.00050	-	<0.00050	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.0010	0.0011	-	0.0012	-	<0.0010	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00020	<0.00020	-	<0.00020	-	<0.00020	-	-

Notes:

- 0.3 exceeded the freshwater aquatic life criteria
- 0.3 exceeded the drinking water quality criteria.
- 0.3 both the aquatic life and drinking water criteria.
- 0.3 mg had detection limit exceeding criteria.
- 0.3 detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	19-Jan-21	21-Apr-21	16-Jul-21	18-Oct-21	18-Jan-22
Date					Monitor	Monitor	Monitor	Sample	Monitor
Field									
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	2.08	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	-	-	0.00024	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	1.75	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	29.5	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	1.04	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	<0.50	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-	-	-	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	<0.000010	-
Dissolved Thorium (Th)	mg/L	-	-	-	-	-	-	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	0.00014	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	<0.00030	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	0.000328	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	0.0014	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	<0.00020	-

Notes:

- 0.3 exceeded the freshwater aquatic life criteria
- 0.3 exceeded the drinking water quality criteria.
- 0.3 with the aquatic life and drinking water criteria.
- 0.3 mg had detection limit exceeding criteria.
- 0.3 detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16
Date					Sample	Sample	Sample	Sample	Sample
Field									
Conductivity	µS/cm				-	-	-	-	-
pH	pH units				-	-	-	-	-
Temperature	°C				-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				-	-	-	-	-
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		<0.005	-	-	-	-
Cyanide, total	mg/L				-	<0.010	<0.010	-	-
Alkalinity (CaCO3)	mg/L	-	-		1.095	530	>930	500	490
Dissolved Hardness (CaCO3)	mg/L	-	500		485	521	533	-	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-	548	503
Bromide	mg/L				-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.0	2.0	<1.0	1.5	1.9
Fluoride	mg/L				-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	69.5	63	55.1	59.8	60.3
Conductivity	uS/cm	-	700		938	947	941	949	944
Specific Conductance	uS/cm				-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.07	0.068	0.46	<0.03	0.033
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.119	0.250	0.060	0.460	0.290
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	0.01	<0.01	<0.01	<0.01	<0.01
Nitrate+Nitrite (N)	mg/L				-	0.253	0.055	0.459	0.286
Total Kjeldahl Nitrogen (N)	mg/L	-	-		0.502	1.350	2.680	-	-
Total Phosphorous (P)	mg/L	-	0.01		3.16	3.83	10.3	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		11,000	2900	7000	-	-
Total Dissolved Solids	mg/L				591	1.8	570	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.5	7.8	7.6	7.5	7.5
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		<0.4	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		<0.4	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Vinyl chloride	ug/L				<0.50	-	-	-	-
Dichloromethane	ug/L	98.1	-		<2.0	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		<0.5	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		123	136	242	25	<20
Biochemical Oxygen Demand	mg/L				-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				<0.5	1.8	4.3	-	-
Total Organic Carbon	mg/L				-	-	-	-	-
Phenols	mg/L	0.05			<0.001	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0030	<0.005	<0.005	<0.005	<0.005
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.005	0.0005	<0.0001	0.0003	<0.0001
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00088	0.00130	0.00120	0.00070	0.00070
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0665	0.1470	0.0650	0.0600	0.0640
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.079	0.107	0.078	0.097	0.100

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16
Date					Sample	Sample	Sample	Sample	Sample
Field									
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.00018	0.00022	0.00008	0.00024	0.00263
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	83	87	91	92	86
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00053	0.00063	0.00058	<0.00005	<0.00005
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00132	0.02220	0.00170	0.00230	0.00320
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.01	<0.010	<0.010	<0.010	<0.010
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0002	0.0002	<0.0001	0.0003	<0.0001
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.005	0.0043	0.0042	0.0046	0.0046
Dissolved Magnesium (Mg)	mg/L	-	700	-	67.2	73.9	74.3	77.5	70.1
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.131	0.128	0.158	0.007	0.031
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00001	<0.00002	<0.00002	<0.00002	<0.00002
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0027	0.0027	0.0025	0.0024	0.0026
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0013	0.0016	0.0009	0.0007	0.0032
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.01	<0.02	<0.02	<0.02	<0.02
Dissolved Potassium (K)	mg/L	373-432	-	-	2.70	3.50	2.87	3.27	2.65
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00013	0.00090	<0.0005	<0.0005	<0.0005
Dissolved Silicon (Si)	mg/L	-	-	-	7.72	9.30	7.70	9.00	8.40
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	25.1	28.8	27.2	29.3	26.0
Dissolved Strontium (Sr)	mg/L	-	-	-	2.06	1.87	1.96	2.05	1.88
Dissolved Sulphur (S)	mg/L	-	-	-	20.0	25.0	21.0	23.0	21.0
Dissolved Tellurium (Te)	mg/L				-	<0.0002	<0.0002	<0.0002	<0.0002
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002
Dissolved Thorium (Th)	mg/L				-	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.005	<0.0002	<0.0002	0.0003	0.0004
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00125	0.00118	0.00118	0.00110	0.00116
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.005	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.005	0.029	<0.004	0.004	0.008
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			25-Oct-16	24-Apr-17	14-Jun-17	30-May-18	11-Jul-18
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW					
Date									
Field					Sample	Sample	Sample	Sample	Sample
Conductivity	µS/cm				-	884	894	837	752
pH	pH units				-	7	7.6	-	-
Temperature	°C				-	6.2	6.2	6.4	6.2
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				-	21.08	20.96	22.06	23.38
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		-	-	-	-	-
Cyanide, total	mg/L	-	-		-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-		500	480	490	355	462
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L				550	497	508	482	479
Bromide	mg/L				-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.2	1.5	1.1	<2.5	<2.5
Fluoride	mg/L				-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	59.3	64.1	66.5	59.7	59.5
Conductivity	uS/cm	-	700		947	936	946	-	-
Specific Conductance	uS/cm				-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.036	<0.03	<0.03	0.199	0.0513
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.150	0.153	0.067	<0.025	0.139
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	<0.01	<0.0050	0.0056
Nitrate+Nitrite (N)	mg/L				0.146	0.153	0.067	<0.030	0.1446
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01		-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-
Total Dissolved Solids	mg/L				-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.8	7.4	7.5		
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		-	-	-	<0.00050	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		-	-	-	0.00057	-
Xylene, m- and p-	µg/L				-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Vinyl chloride	ug/L				-	-	-	<0.00040	-
Dichloromethane	ug/L	98.1	-		-	-	-	<0.0050	-
1,4-dichlorobenzene	ug/L	26	-		-	-	-	<0.0010	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		<20	<20	<20	162.00	<20
Biochemical Oxygen Demand	mg/L				-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				-	-	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-
Phenols	mg/L	0.05			-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	<0.005	<0.0050	<0.0050	0.0042	0.0023
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.0002	<0.00010	0.0003	<0.00010	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00080	0.00076	0.00078	0.00088	0.00073
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0680	0.0520	0.0591	0.0635	0.0681
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Bismuth (Bi)	mg/L	-	-		<0.0001	<0.00010	<0.00010	<0.000050	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.098	0.099	0.091	0.079	0.074

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	25-Oct-16	24-Apr-17	14-Jun-17	30-May-18	11-Jul-18
Date					Sample	Sample	Sample	Sample	Sample
Field									
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.00002	0.000539	0.000456	0.0000174	0.000643
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	87	85	88	84	78
Dissolved Cesium (Cs)	mg/L				-	-	-	<0.000010	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0005	<0.00050	<0.00050	<0.00010	<0.00010
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00045	<0.00010	<0.00010	0.0006	<0.00010
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00040	0.00345	0.00171	0.00251	0.00428
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	<0.010	<0.010	0.058	<0.010
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0001	<0.00010	<0.00010	0.000124	<0.000050
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0044	0.00434	0.00428	0.004	0.0039
Dissolved Magnesium (Mg)	mg/L	-	700	-	80.9	69.0	70.0	66.2	69.0
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.119	0.0058	0.0033	0.1660	0.1070
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00002	<0.00002	<0.00002	<0.0000050	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0026	0.0024	0.0023	0.0023	0.0022
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0020	0.00092	0.00095	0.00086	0.00177
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.02	<0.050	<0.050	<0.050	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	2.87	2.67	2.83	2.58	2.68
Dissolved Rubidium (Rb)	mg/L				-	-	-	0.00	0.00
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.0005	<0.00050	<0.00050	<0.000050	0.00027
Dissolved Silicon (Si)	mg/L	-	-	-	8.90	8.20	9.20	7.96	8.07
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	0.00011	<0.000050	<0.000050	<0.000010	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	28.2	25.5	25.3	23.7	24.7
Dissolved Strontium (Sr)	mg/L	-	-	-	2.19	1.750	1.980	1.950	1.750
Dissolved Sulphur (S)	mg/L	-	-	-	23.0	19.5	21.3	22.5	22.5
Dissolved Tellurium (Te)	mg/L				<0.0002	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00002	<0.000020	<0.000020	<0.000010	0.000015
Dissolved Thorium (Th)	mg/L				<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.0002	<0.00020	0.00027	<0.00010	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.0050	<0.0050	<0.00030	<0.00030
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00113	0.00112	0.00114	0.00113	0.00101
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.001	<0.0010	<0.0010	<0.00050	0.00087
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.01	0.0147	0.0112	0.0028	0.0035
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0001	<0.00010	<0.00010	0.000066	0.000095

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			BH 2 - E2515				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	11-Sep-18	17-Apr-19	13-Aug-19	20-Nov-19	31-Mar-20
Date					Sample	Sample	Sample	Sample	Sample
Field									
Conductivity	µS/cm				704	736	670	561	566
pH	pH units				-	7	7.16	7.31	7.54
Temperature	°C				6.2	6	6.5	6	5.3
Dissolved Oxygen	mg/L				-	2	3.8	3.4	5.8
ORP	mV				-	331.6	307.8	346.1	236.9
Depth to Water	m				21.05	20.9	21.1	21.02	20.94
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	501	511	429	476	504
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	505
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	481	482	457	812	-
Bromide	mg/L	-	-	-	-	-	-	<0.25	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	<2.5	<2.5	<2.5	<2.5	<2.50
Fluoride	mg/L	-	-	-	-	<0.10	<0.10	<0.10	<0.100
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	65.8	13.9	64.3	62.4	59.6
Conductivity	uS/cm	-	700	-	-	-	-	812	804
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	0.159	0.103	0.202	0.734	0.187
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	<0.025	0.128	0.05	0.033	0.0443
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.0050	<0.0050	0.0147	<0.0050	<0.00500
Nitrate+Nitrite (N)	mg/L	-	-	-	<0.030	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	0.734	9.84
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	8.19	-	8.12	8.11	8.14
Volatiles									
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	-	-	-	-	-	-	-	-
Xylenes, total	µg/L	-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-	-	<20	38.00	96	40.00	132
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	7.83	14.1	83.20	2.54
Phenols	mg/L	0.05	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0067	0.0026	0.0128	0.0024	1.3
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00013	0.00016	0.00011	<0.00010	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00078	0.00075	0.001	0.00186	0.00185
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0576	0.0804	0.0683	0.0568	0.0908
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.087	0.077	0.081	0.078	0.078

Parameters	Units	BC MoE Guidelines (a)			BH 2 - E25151				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	11-Sep-18	17-Apr-19	13-Aug-19	20-Nov-19	31-Mar-20
Date					Sample	Sample	Sample	Sample	Sample
Field									
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.0000442	0.0000097	0.0000232	0.0000463	0.000104
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	80	84	76.5	82	86.3
Dissolved Cesium (Cs)	mg/L			-	0	<0.000010	0.000013	0	0.000109
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	0.00143
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.0005	0.00072	0.00045	0.00047	0.00198
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00053	0.00070	0.00078	<0.00020	0.00724
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.077	0.019	0.071	0.195	2.17
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	<0.000050	0.000064	<0.000050	0.001
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0042	0.0034	0.004	0.0036	0.0047
Dissolved Magnesium (Mg)	mg/L	-	700	-	68.5	66.3	64.6	66.5	70.3
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.1550	0.1940	0.176	0.1450	0.402
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000425
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0023	0.0024	0.00229	0.0022	0.00175
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00111	0.00164	0.00109	<0.00050	0.00397
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	<0.050	<0.050	0.42
Dissolved Potassium (K)	mg/L	373-432	-	-	2.67	2.84	2.56	2.46	2.79
Dissolved Rubidium (Rb)	mg/L			-	0.00	0.00	0.00044	0.00	0.001
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00011	0.00006	0.000056	<0.000050	0.000061
Dissolved Silicon (Si)	mg/L	-	-	-	7.43	6.94	7.71	8.17	10.2
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	<0.000010	<0.000010	0.000014
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	23.7	25.0	23.7	24.0	23.6
Dissolved Strontium (Sr)	mg/L	-	-	-	1.890	2.030	1.82	1.870	1.99
Dissolved Sulphur (S)	mg/L	-	-	-	21.2	21.0	21.2	22.8	21.3
Dissolved Tellurium (Te)	mg/L			-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	<0.000010	<0.000010	0.000011
Dissolved Thorium (Th)	mg/L			-	<0.00010	<0.00010	<0.00010	<0.00010	0.00019
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	<0.00030	<0.00030	<0.00030	0.0234
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00114	0.00142	0.00115	0.00105	0.001
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	<0.00050	<0.00050	<0.00050	0.00328
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.0010	0.0046	0.0036	0.0012	0.014
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.000060	0.000088	<0.00020	<0.00020	0.00049

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)				25-Jun-20	25-Jun-20	23-Jul-20	25-Aug-20
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	³				
Date					Sample	DUP	Monitor	Sample	
Field									
Conductivity	µS/cm				642	-	639	614	
pH	pH units				7.06	-	-	7.21	
Temperature	°C				6.9	-	6.3	6.1	
Dissolved Oxygen	mg/L				6.4	-	-	4.2	
ORP	mV				343.2	-	-	322	
Depth to Water	m				23.68	-	21.04	21.12	
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		-	-	-	-	
Cyanide, total	mg/L				-	-	-	-	
Alkalinity (CaCO ₃)	mg/L	-	-		473	-	-	472	
Dissolved Hardness (CaCO ₃)	mg/L	-	500		499	-	-	52	
Hardness, Total (Total as CaCO ₃)	mg/L				-	501	-	-	
Bromide	mg/L				<0.250	<0.250	-	<0.250	
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	<2.50	<2.50	-	<2.5	
Fluoride	mg/L				<0.100	<0.100	-	<0.100	
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	60	60.1	-	76	
Conductivity	uS/cm	-	700		921	913	-	921	
Specific Conductance	uS/cm				-	-	-	-	
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.126	0.125	-	0.0533	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.134	0.167	-	0.189	
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.0050	<0.0050	-	<0.0050	
Nitrate+Nitrite (N)	mg/L				-	-	-	-	
Total Kjeldahl Nitrogen (N)	mg/L	-	-		0.894	1.070	-	0.236	
Total Phosphorous (P)	mg/L	-	0.01		-	-	-	-	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	
Total Dissolved Solids	mg/L				-	-	-	-	
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.54	-	-	7.88	
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		<0.50	<0.50	-	<0.50	
Ethylbenzene	µg/L				<0.50	<0.50	-	<0.50	
Methyl t-butyl ether (MTBE)	µg/L				<0.50	<0.50	-	<0.50	
Styrene	µg/L				<0.50	<0.50	-	<0.50	
Toluene	ug/L	0.5 (a)	-		<0.50	<0.50	-	3.32	
Xylene, m- and p-	µg/L				<0.50	<0.50	-	<0.50	
Xylene, o-	µg/L				<0.50	<0.50	-	<0.50	
Xylenes, total	µg/L				<0.75	<0.75	-	<0.75	
BTEX+Styrene, total	µg/L				<1.5	<1.5	-	-	
Vinyl chloride	ug/L				-	-	-	-	
Dichloromethane	ug/L	98.1	-		-	-	-	-	
1,4-dichlorobenzene	ug/L	26	-		-	-	-	-	
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				110	112	-	94.9	
difluorobenzene, 1,4-	%				97.1	96.2	-	115	
Hydrocarbons									
EPH (C10-C19)	µg/L				<250	<250	-	<250	
EPH (C10-C32)	µg/L				-	-	-	-	
EPH (C19-C32)	µg/L				<250	<250	-	<250	
TEH (C10-C30), BC	µg/L				<250	<250	-	-	
VHw (C6-C10)	µg/L				<100	<100	-	<100	
VPHw	µg/L				<100	<100	-	<100	
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				94.7	91	-	93	
dichlorotoluene, 3,4-	%				76.2	89.6	-	90.9	
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		91.00	63.00	-	34	
Biochemical Oxygen Demand	mg/L				-	-	-	-	
Dissolved Organic Carbon (C)	mg/L				-	-	-	-	
Total Organic Carbon	mg/L				13.30	14.40	-	4.11	
Phenols	mg/L	0.05					-	-	
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0025	0.0018	-	0.0013	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00026	0.00025	-	0.00032	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.0011	0.0011	-	0.00062	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0633	0.0604	-	0.0664	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	<0.000100	-	<0.000100	
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	-	<0.000050	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.087	0.093	-	0.086	

Parameters	Units	BC MoE Guidelines (a)				3			
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW		25-Jun-20	25-Jun-20	23-Jul-20	25-Aug-20
Date					Sample	DUP	Monitor	Sample	
Field									
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.0000778	0.0000607	-	0.0000654	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	86.1	88.8	-	93.9	
Dissolved Cesium (Cs)	mg/L			-	<0.000010	<0.000010	-	<0.000010	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00010	<0.00010	-	<0.00010	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.0004	0.00041	-	0.00016	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00414	0.00070	-	0.00053	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	<0.010	-	<0.010	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000068	<0.000050	-	<0.000050	
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0044	0.00045	-	0.00044	
Dissolved Magnesium (Mg)	mg/L	-	700	-	69.0	67.8	-	69.9	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0793	0.0818	-	0.0293	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	<0.0000050	-	<0.0000050	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0028	0.0027	-	0.00232	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00124	0.00124	-	0.0016	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	-	<0.050	
Dissolved Potassium (K)	mg/L	373-432	-	-	2.58	2.56	-	2.56	
Dissolved Rubidium (Rb)	mg/L			-	0.00	0.00	-	0.00042	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00031	0.00020	-	0.000275	
Dissolved Silicon (Si)	mg/L	-	-	-	8.09	8.43	-	7.52	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	-	<0.000010	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	25.5	25.3	-	23.5	
Dissolved Strontium (Sr)	mg/L	-	-	-	2.030	1.980	-	2.07	
Dissolved Sulphur (S)	mg/L	-	-	-	23.6	24.7	-	26.8	
Dissolved Tellurium (Te)	mg/L			-	<0.00020	<0.00020	-	<0.00020	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	-	<0.000010	
Dissolved Thorium (Th)	mg/L			-	<0.00010	<0.00010	-	<0.00010	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.00015	0.00014	-	<0.00010	
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	<0.00030	-	<0.00030	
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	<0.00010	-	<0.00010	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00109	0.00114	-	0.00133	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	<0.00050	-	<0.00050	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0034	0.0017	-	0.0012	
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00020	<0.00020	-	<0.00020	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20	19-Jan-21
Date					Monitor	Sample	Monitor	Monitor	Monitor
Field									
Conductivity	µS/cm				614	403.5	708	868	866
pH	pH units				-	7.52	-	-	-
Temperature	°C				6.1	6.3	6.1	6.1	6
Dissolved Oxygen	mg/L				-	1.3	-	-	-
ORP	mV				-	242.6	-	-	-
Depth to Water	m				21.08	21.18	20.92	20.96	20.91
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	-	471	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	499	-	-	-
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	<0.250	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	<2.5	-	-	-
Fluoride	mg/L	-	-	-	-	<0.100	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	72.1	-	-	-
Conductivity	uS/cm	-	700	-	-	931	-	-	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	0.0485	-	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	0.096	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	0.0055	-	-	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	0.482	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	7.7	-	-	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)	-	-	<0.50	-	-	-
Ethylbenzene	µg/L	-	-	-	-	<0.50	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	<0.50	-	-	-
Styrene	µg/L	-	-	-	-	<0.50	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	1.88	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	<0.50	-	-	-
Xylene, o-	µg/L	-	-	-	-	<0.50	-	-	-
Xylenes, total	µg/L	-	-	-	-	<0.75	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%	-	-	-	-	90.9	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	90.8	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L	-	-	-	-	<250	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	<250	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	<100	-	-	-
VPHw	µg/L	-	-	-	-	<100	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	88.3	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	98.2	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-	-	-	<20	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	9.11	-	-	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0442	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	0.00015	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00054	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.0616	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.000100	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.08	-	-	-

Parameters	Units	BC MoE Guidelines (a)			9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20	19-Jan-21
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW					
Date									
Field					Monitor	Sample	Monitor	Monitor	
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-	0.000757	-	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	85.4	-	-	
Dissolved Cesium (Cs)	mg/L				-	<0.00010	-	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	<0.00010	-	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	0.00025	-	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00066	-	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	0.103	-	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	<0.00050	-	-	
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	0.0045	-	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	69.4	-	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	0.0731	-	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.000050	-	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.0023	-	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	0.00179	-	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	-	-	
Dissolved Potassium (K)	mg/L	373-432	-	-	-	2.74	-	-	
Dissolved Rubidium (Rb)	mg/L			-	-	0.00	-	-	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	0.00014	-	-	
Dissolved Silicon (Si)	mg/L	-	-	-	-	7.87	-	-	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	<0.000010	-	-	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	24.0	-	-	
Dissolved Strontium (Sr)	mg/L	-	-	-	-	1.930	-	-	
Dissolved Sulphur (S)	mg/L	-	-	-	-	27.3	-	-	
Dissolved Tellurium (Te)	mg/L			-	-	<0.00020	-	-	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	0.00001	-	-	
Dissolved Thorium (Th)	mg/L			-	-	<0.00010	-	-	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	<0.00010	-	-	
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.00030	-	-	
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	<0.00010	-	-	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.00117	-	-	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	<0.00050	-	-	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	0.0018	-	-	
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.00020	-	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			22-Apr-21	16-Jul-21	18-Oct-21	18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW				
Date								
Field				Monitor	Monitor	Sample	Monitor	
Conductivity	µS/cm			822	545	624	579	
pH	pH units			-	-	7.34	7.65	
Temperature	°C			6.2	6.5	6.3	6.2	
Dissolved Oxygen	mg/L			-	-	6.8	3.7	
ORP	mV			-	-	243.8	147.7	
Depth to Water	m			20.88	20.97	20.66	22.6	
Analyte								
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	
Cyanide, total	mg/L	-	-	-	-	-	-	
Alkalinity (CaCO3)	mg/L	-	-	-	-	490	-	
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	489	-	
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	
Bromide	mg/L	-	-	-	-	-	-	
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	<2.50	-	
Fluoride	mg/L	-	-	-	-	<0.100	-	
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	64	-	
Conductivity	uS/cm	-	700	-	-	921	-	
Specific Conductance	uS/cm	-	-	-	-	-	-	
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	0.0940	-	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	<0.0250	-	
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	<0.00500	-	
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	0.936	-	
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	7.79	-	
Volatiles								
Benzene	ug/L	40 (a)	5 (a)	-	-	<0.50	-	
Ethylbenzene	µg/L	-	-	-	-	<0.50	-	
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	<0.50	-	
Styrene	µg/L	-	-	-	-	<0.50	-	
Toluene	ug/L	0.5 (a)	-	-	-	1.01	-	
Xylene, m- and p-	µg/L	-	-	-	-	<0.40	-	
Xylene, o-	µg/L	-	-	-	-	<0.30	-	
Xylenes, total	µg/L	-	-	-	-	<0.50	-	
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	
Vinyl chloride	ug/L	-	-	-	-	-	-	
Dichloromethane	ug/L	98.1	-	-	-	-	-	
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	%	-	-	-	-	97.2	-	
difluorobenzene, 1,4-	%	-	-	-	-	102	-	
Hydrocarbons								
EPH (C10-C19)	µg/L	-	-	-	-	<250	-	
EPH (C10-C32)	µg/L	-	-	-	-	<400	-	
EPH (C19-C32)	µg/L	-	-	-	-	<250	-	
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	
VHw (C6-C10)	µg/L	-	-	-	-	<100	-	
VPHw	µg/L	-	-	-	-	<100	-	
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	81.3	-	
dichlorotoluene, 3,4-	%	-	-	-	-	120	-	
Misc. Organics								
Chemical Oxygen Demand	mg/L	-	-	-	-	46.00	-	
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	
Total Organic Carbon	mg/L	-	-	-	-	1.26	-	
Phenols	mg/L	0.05	-	-	-	-	-	
Dissolved Metals								
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0033	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	0.00020	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00054	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.0656	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.000100	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.080	-	

Parameters	Units	BC MoE Guidelines (a)			22-Apr-21	16-Jul-21	18-Oct-21	18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW				
Date					Monitor	Monitor	Sample	Monitor
Field								
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-	-	0.000332	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	84.3	-
Dissolved Cesium (Cs)	mg/L				-	-	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	<0.00050	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	0.00020	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	<0.00020	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	<0.010	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	<0.000050	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	0.0045	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	67.7	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	0.0964	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	<0.000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	0.00226	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	0.00220	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	2.76	-
Dissolved Rubidium (Rb)	mg/L				-	-	0.00067	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	0.000144	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	7.13	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	25.2	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	1.91	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	22.2	-
Dissolved Tellurium (Te)	mg/L				-	-	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	0.000014	-
Dissolved Thorium (Th)	mg/L				-	-	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	<0.00010	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	<0.00030	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	0.00124	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	0.0014	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	<0.00020	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h.copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16
Date					Sample	Sample	Sample	Sample	Dry
Field									
Conductivity	µS/cm				-	-	-	-	-
pH	pH units				-	-	-	-	-
Temperature	°C				-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				-	-	-	-	-
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		<0.005	-	-	-	-
Cyanide, total	mg/L				-	<0.010	<0.010	-	-
Alkalinity (CaCO3)	mg/L	-	-		265	240	-	250	-
Dissolved Hardness (CaCO3)	mg/L	-	500		216	557	239	-	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-	247	-
Bromide	mg/L				-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	2.8	3.9	-	3.7	-
Fluoride	mg/L				-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	176	180	-	184	-
Conductivity	uS/cm	-	700		837	817	-	829	-
Specific Conductance	uS/cm				-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.07	0.04	0.04	<0.03	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.404	0.310	0.320	0.320	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	-	<0.01	-
Nitrate+Nitrite (N)	mg/L				-	0.311	0.32	0.319	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-		0.176	0.370	0.100	-	-
Total Phosphorous (P)	mg/L	-	0.01		0.15	0.32	<0.1	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		300	170	-	-	-
Total Dissolved Solids	mg/L				542	1.3	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.9	7.7	-	7.7	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		<0.4	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		<0.4	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Vinyl chloride	ug/L				<0.50	-	-	-	-
Dichloromethane	ug/L	98.1	-		<2.0	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		<0.5	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		<20	<20	<20	<20	-
Biochemical Oxygen Demand	mg/L				-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				<0.5	1.3	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-
Phenols	mg/L	0.05			<0.001	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0058	<0.005	<0.005	<0.005	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.005	0.0005	0.0001	0.0005	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00048	0.00210	<0.0005	<0.0005	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0347	0.3860	0.0320	0.0320	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.0001	<0.0001	<0.0001	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.056	0.040	0.059	0.072	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			25-Oct-16	24-Apr-17	14-Jun-17	31-Aug-17	28-May-18
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW					
Date									
Field					Sample	Sample	Sample	M/E	M/E
Conductivity	µS/cm				-	790	791	819	837
pH	pH units				-	7.6	7.3	7.6	-
Temperature	°C				-	6.5	7.2	7.8	6.4
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				-	57	57.59	57	22.06
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L				-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	250	240	240	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L			236	220	242	-	-	-
Bromide	mg/L				-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	3.4	2.7	2.5	-	-
Fluoride	mg/L				-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	181	184	223	-	-
Conductivity	uS/cm	-	700		819	813	831	-	-
Specific Conductance	uS/cm				-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		<0.03	<0.03	<0.03	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.250	0.246	0.13	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	<0.01	-	-
Nitrate+Nitrite (N)	mg/L				0.254	0.246	0.128	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01		-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-
Total Dissolved Solids	mg/L				-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.8	8	7.6	-	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Vinyl chloride	ug/L				-	-	-	-	-
Dichloromethane	ug/L	98.1	-		-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		<20	36	<20	-	-
Biochemical Oxygen Demand	mg/L				-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				-	-	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-
Phenols	mg/L	0.05			-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	<0.005	<0.0050	0.0059	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.0005	0.00029	0.00063	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	<0.0005	<0.00050	<0.00050	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0350	0.0281	0.0327	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.00010	<0.00010	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.00010	<0.00010	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.073	0.069	0.07	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	30-May-18	10-Jul-18	11-Sep-18	22-Oct-18	17-Apr-19
Date					Sample	M/E	Sample	M/E	Dry
Field									
Conductivity	µS/cm				-	-	-	638	686
pH	pH units				-	-	-	-	-
Temperature	°C				-	-	-	6.9	7
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				-	58	-	57.4	57.06
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L				-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	207	-	200	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L				228	-	177	-	-
Bromide	mg/L				-	-	<0.25	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.75	-	<2.5	-	-
Fluoride	mg/L				-	-	<0.10	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	185	-	199	-	-
Conductivity	uS/cm	-	700	-	-	-	-	-	-
Specific Conductance	uS/cm				-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.0056	-	0.0067	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.288	-	<0.025	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.0010	-	<0.0050	-	-
Nitrate+Nitrite (N)	mg/L				<0.289	-	<0.030	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L				-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	8.25	-	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)		<0.00050	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		0.0112	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Vinyl chloride	ug/L				<0.00040	-	-	-	-
Dichloromethane	ug/L	98.1	-		<0.0050	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		<0.0010	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-		<20	-	<20	-	-
Biochemical Oxygen Demand	mg/L				-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				-	-	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-
Phenols	mg/L	0.05			-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0074	-	0.006	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00043	-	0.00036	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.0004	-	0.00032	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0359	-	0.0309	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	-	<0.00010	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	-	<0.000050	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.061	-	0.067	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			BH 3 - E251514				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	13-Aug-19	20-Nov-19	30-Mar-20	22-Jun-20	23-Jul-20
Date									
Field					Dry	Dry	Dry	Almost Dry	Monitor
Conductivity	µS/cm				647	632	-	624	614
pH	pH units				-	-	-	-	-
Temperature	°C				7.5	6.8	-	6.8	7.1
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				51.22	57.12	-	57	56.84
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	-	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	-	-	-	-
Fluoride	mg/L	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	-	-	-	-
Conductivity	uS/cm	-	700	-	-	-	-	-	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	-	-	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	-	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	-	-	-	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-	-	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	-	-	-	-	-	-	-	-
Xylenes, total	µg/L	-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			25-Aug-20	9-Sep-20	21-Oct-20
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW			
Date							
Field					Casing Brok	Monitor	Monitor
Conductivity	µS/cm				584	598	702
pH	pH units				-	-	-
Temperature	°C				7	7	6.9
Dissolved Oxygen	mg/L				-	-	-
ORP	mV				-	-	-
Depth to Water	m				57.87	56.85	36.88
Analyte							
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		-	-	-
Cyanide, total	mg/L				-	-	-
Alkalinity (CaCO3)	mg/L	-	-		-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-
Bromide	mg/L				-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	-	-
Fluoride	mg/L				-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	-	-
Conductivity	uS/cm	-	700		-	-	-
Specific Conductance	uS/cm				-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		-	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	-	-
Nitrate+Nitrite (N)	mg/L				-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-	-	-
Total Phosphorous (P)	mg/L	-	0.01		-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-
Total Dissolved Solids	mg/L				-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-
Volatiles							
Benzene	ug/L	40 (a)	5 (a)		-	-	-
Ethylbenzene	µg/L				-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-
Styrene	µg/L				-	-	-
Toluene	ug/L	0.5 (a)	-		-	-	-
Xylene, m- and p-	µg/L				-	-	-
Xylene, o-	µg/L				-	-	-
Xylenes, total	µg/L				-	-	-
BTEX+Styrene, total	µg/L				-	-	-
Vinyl chloride	ug/L				-	-	-
Dichloromethane	ug/L	98.1	-		-	-	-
1,4-dichlorobenzene	ug/L	26	-		-	-	-
Volatile Organic Compounds Surrogates							
bromofluorobenzene, 4-	%				-	-	-
difluorobenzene, 1,4-	%				-	-	-
Hydrocarbons							
EPH (C10-C19)	µg/L				-	-	-
EPH (C10-C32)	µg/L				-	-	-
EPH (C19-C32)	µg/L				-	-	-
TEH (C10-C30), BC	µg/L				-	-	-
VHw (C6-C10)	µg/L				-	-	-
VPHw	µg/L				-	-	-
Hydrocarbons Surrogates							
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-
dichlorotoluene, 3,4-	%				-	-	-
Misc. Organics							
Chemical Oxygen Demand	mg/L	-	-		-	-	-
Biochemical Oxygen Demand	mg/L				-	-	-
Dissolved Organic Carbon (C)	mg/L				-	-	-
Total Organic Carbon	mg/L				-	-	-
Phenols	mg/L	0.05			-	-	-
Dissolved Metals							
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MOE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	12-Nov-20	16-Dec-20	22-Dec-20	21-Jan-21	21-Apr-21
Date					Monitor	Monitor	Monitor	Sample	Monitor
Field									
Conductivity	µS/cm				687	843	878	819	727
pH	pH units				-	-	-	-	-
Temperature	°C				6.9	6.9	6.9	6.9	7.1
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Depth to Water	m				56.76	56.76	56.76	57	56.84
Analyte									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	-	-	-	257	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	243	-
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	-	-	<0.250	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	-	-	<2.50	-
Fluoride	mg/L	-	-	-	-	-	-	<0.100	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	-	-	193	-
Conductivity	uS/cm	-	700	-	-	-	-	843	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	-	-	<0.0050	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	-	-	0.132	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	-	-	0.0293	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	0.404	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-	8.48	-
Volatiles									
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	<0.50	-
Ethylbenzene	µg/L	-	-	-	-	-	-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	<0.50	-
Styrene	µg/L	-	-	-	-	-	-	<0.50	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	<0.50	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	<0.40	-
Xylene, o-	µg/L	-	-	-	-	-	-	<0.30	-
Xylenes, total	µg/L	-	-	-	-	-	-	<0.50	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%	-	-	-	-	-	-	102	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	80.2	-
Hydrocarbons									
EPH (C10-C19)	µg/L	-	-	-	-	-	-	630	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	1800	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	<100	-
VPHw	µg/L	-	-	-	-	-	-	<100	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	99.8	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	89.7	-
Misc. Organics									
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	136	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	30.5	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	0.0040	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	0.00914	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	0.00044	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	0.0290	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	0.070	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			16-Jul-21	22-Oct-21	18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW			
Date					16-Jul-21	22-Oct-21	18-Jan-22
Field					Monitor	Sample	Monitor
Conductivity	µS/cm				810	814	803
pH	pH units				-	-	-
Temperature	°C				7.2	7	7
Dissolved Oxygen	mg/L				-	-	-
ORP	mV				-	-	-
Depth to Water	m				56.76	57.87	56.95
Analyte							
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-
Cyanide, total	mg/L				-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	-	255	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	231	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-
Bromide	mg/L				-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	<2.50	-
Fluoride	mg/L				-	<0.100	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	186	-
Conductivity	uS/cm	-	700		-	815	-
Specific Conductance	uS/cm				-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		-	<0.0050	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	0.217	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	<0.0050	-
Nitrate+Nitrite (N)	mg/L				-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-	0.054	-
Total Phosphorous (P)	mg/L	-	0.01		-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-
Total Dissolved Solids	mg/L				-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	8.13	-
Volatiles							
Benzene	ug/L	40 (a)	5 (a)		-	<0.50	-
Ethylbenzene	µg/L				-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L				-	<0.50	-
Styrene	µg/L				-	<0.50	-
Toluene	ug/L	0.5 (a)	-		-	<0.50	-
Xylene, m- and p-	µg/L				-	<0.40	-
Xylene, o-	µg/L				-	<0.30	-
Xylenes, total	µg/L				-	<0.50	-
BTEX+Styrene, total	µg/L				-	-	-
Vinyl chloride	ug/L				-	-	-
Dichloromethane	ug/L	98.1	-		-	-	-
1,4-dichlorobenzene	ug/L	26	-		-	-	-
Volatile Organic Compounds Surrogates							
bromofluorobenzene, 4-	%				-	99.3	-
difluorobenzene, 1,4-	%				-	102	-
Hydrocarbons							
EPH (C10-C19)	µg/L				-	<250	-
EPH (C10-C32)	µg/L				-	<400	-
EPH (C19-C32)	µg/L				-	<250	-
TEH (C10-C30), BC	µg/L				-	-	-
VHw (C6-C10)	µg/L				-	<100	-
VPHw	µg/L				-	<100	-
Hydrocarbons Surrogates							
bromobenzotrifluoride, 2- (EPH surr)	%				-	97	-
dichlorotoluene, 3,4-	%				-	113	-
Misc. Organics							
Chemical Oxygen Demand	mg/L	-	-		-	<20	-
Biochemical Oxygen Demand	mg/L				-	-	-
Dissolved Organic Carbon (C)	mg/L				-	-	-
Total Organic Carbon	mg/L				-	0.87	-
Phenols	mg/L	0.05			-	-	-
Dissolved Metals							
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0040	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	0.00037	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00034	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.0288	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.059	-

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16
Date					Sample	Sample	Sample	Sample	Dry
Field									
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	0.00006	0.00007	0.00015	0.00023	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	64	141	71	72	-
Dissolved Cesium (Cs)	mg/L								
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0010	<0.0005	<0.0005	<0.0005	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.0050	0.00783	<0.00005	0.00009	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00128	0.00520	0.00350	0.00270	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.01	0.03	<0.010	<0.010	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0002	<0.0001	<0.0001	0.0004	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.005	0.002	0.0017	0.0019	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	13.7	49.9	15.1	16.3	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0020	3.97	0.0011	0.0439	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00001	<0.00002	<0.00002	<0.00002	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0071	0.0012	0.0051	0.0059	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	<0.001	0.0126	0.001	0.0016	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.035	<0.02	<0.02	0.020	-
Dissolved Potassium (K)	mg/L	373-432	-	-	2.13	3.56	2.15	2.25	-
Dissolved Rubidium (Rb)	mg/L								
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00033	0.00080	0.00050	0.00060	-
Dissolved Silicon (Si)	mg/L	-	-	-	4.01	10.20	3.70	4.40	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00002	<0.00005	<0.00005	<0.00005	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	113	87	100	107	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.912	1.030	0.893	0.949	-
Dissolved Sulphur (S)	mg/L	-	-	-	57.1	7.0	63.0	71.0	-
Dissolved Tellurium (Te)	mg/L					<0.0002	<0.0002	<0.0002	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00005	<0.00002	<0.00002	0.00002	-
Dissolved Thorium (Th)	mg/L					<0.0001	<0.0001	<0.0001	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.005	<0.0002	0.0006	0.0004	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.005	<0.005	<0.005	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00245	0.00071	0.00231	0.00239	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.005	<0.001	<0.001	<0.001	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.005	0.037	0.006	<0.004	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0005	0.0002	<0.0001	<0.0001	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	25-Oct-16	24-Apr-17	14-Jun-17	31-Aug-17	28-May-18
Date					Sample	Sample	Sample	M/E	M/E
Field									
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	0.00032	0.000141	0.000186	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	67	65.2	72.1	-	-
Dissolved Cesium (Cs)	mg/L							-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0005	<0.00050	<0.00050	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.00005	<0.00010	<0.00010	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00230	0.00069	0.00376	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	<0.010	<0.010	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0001	<0.00010	<0.00010	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0025	0.00161	0.00191	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	16.3	14	15	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0046	0.00143	0.00352	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00002	<0.00002	<0.00002	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0060	0.00568	0.00604	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0021	0.00041	0.00073	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.030	<0.050	<0.050	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	2.31	1.98	2.23	-	-
Dissolved Rubidium (Rb)	mg/L							-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00050	<0.00050	0.0005	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	4.10	3.9	4.6	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	0.00008	<0.000050	<0.000050	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	103	94.4	99.6	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	1.010	0.829	0.956	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	68.0	59.3	69.7	-	-
Dissolved Tellurium (Te)	mg/L				<0.0002	<0.00020	<0.00020	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	0.00003	<0.000020	<0.000020	-	-
Dissolved Thorium (Th)	mg/L				<0.0001	<0.00010	<0.00010	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.0002	<0.00020	<0.00020	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.0050	<0.0050	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00239	0.00233	0.0025	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.001	<0.0010	<0.0010	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.045	<0.0040	0.006	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0001	<0.00010	<0.00010	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	30-May-18	10-Jul-18	11-Sep-18	22-Oct-18	17-Apr-19
Date					Sample	M/E	Sample	M/E	Dry
Field									
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	0.000115	-	0.000117	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	68.1	-	47.7	-	-
Dissolved Cesium (Cs)	mg/L				<0.000010	-	<0.000010	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00010	-	<0.00010	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00012	-	<0.00010	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00162	-	0.00109	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	-	<0.010	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000056	-	<0.000050	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0018	-	0.0018	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	14.1	-	14.1	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0318	-	0.0231	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	-	<0.0000050	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00534	-	0.00513	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00077	-	0.00055	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	-	<0.050	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	2.08	-	1.9	-	-
Dissolved Rubidium (Rb)	mg/L				0.00049	-	0.00051	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000526	-	0.000585	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	3.96	-	3.69	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	-	<0.000010	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	92.6	-	93.9	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.912	-	0.846	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	69.5	-	66.4	-	-
Dissolved Tellurium (Te)	mg/L				<0.00020	-	<0.00020	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	-	0.00001	-	-
Dissolved Thorium (Th)	mg/L				<0.00010	-	<0.00010	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.00734	-	<0.00010	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	-	<0.00030	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	0.00019	-	0.00031	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00238	-	0.00215	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	-	<0.00050	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0027	-	0.0015	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.000060	-	<0.000060	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			BH 3 - E251514				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	13-Aug-19	20-Nov-19	30-Mar-20	22-Jun-20	23-Jul-20
Date					Dry	Dry	Dry	Almost Dry	Monitor
Field									
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	-	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)					
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW			
Date					25-Aug-20	9-Sep-20	21-Oct-20
Field					Casing Brok	Monitor	Monitor
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	12-Nov-20	16-Dec-20	22-Dec-20	21-Jan-21	21-Apr-21
Date					Monitor	Monitor	Monitor	Sample	Monitor
Field									
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	-	-	-	0.000167	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	70.8	-
Dissolved Cesium (Cs)	mg/L				-	-	-	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	0.00078	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	<0.010	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	0.0017	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	16.0	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	0.00164	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	<0.0000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	0.00435	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	2.23	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	0.00044	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	0.000424	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	3.86	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	95.7	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	0.956	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	70.5	-
Dissolved Tellurium (Te)	mg/L				-	-	-	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	<0.000010	-
Dissolved Thorium (Th)	mg/L				-	-	-	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	0.00020	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	0.00039	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	0.00014	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	0.00226	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	0.0051	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	<0.00020	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	16-Jul-21	22-Oct-21	18-Jan-22	
Date					Monitor	Sample	Monitor	
Field								
Dissolved Cadmium (Cd)	mg/L	.000018-0.00024 (Hardness 50-1,000 mg/L) (	0.005, MAC	0.005 ⁽²⁾	-	0.000135	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	68.0	-	
Dissolved Cesium (Cs)	mg/L				-	<0.000010	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	<0.00050	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	<0.00010	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00053	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	<0.010	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	<0.000050	-	
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	0.0020	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	14.8	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	0.00388	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.0000050	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.00520	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	<0.00050	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	-	
Dissolved Potassium (K)	mg/L	373-432	-	-	-	2.04	-	
Dissolved Rubidium (Rb)	mg/L				-	0.00050	-	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	0.000447	-	
Dissolved Silicon (Si)	mg/L	-	-	-	-	3.68	-	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	<0.000010	-	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	96.9	-	
Dissolved Strontium (Sr)	mg/L	-	-	-	-	0.900	-	
Dissolved Sulphur (S)	mg/L	-	-	-	-	61.9	-	
Dissolved Tellurium (Te)	mg/L				-	<0.00020	-	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	0.000013	-	
Dissolved Thorium (Th)	mg/L				-	<0.00010	-	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	0.00013	-	
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.00030	-	
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	0.00015	-	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.00213	-	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	<0.00050	-	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	0.0025	-	
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.00020	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16
Date					Sample	Sample	Sample	Sample	Sample	Sample
Field										
Conductivity	µS/cm				-	-	-	-	-	-
pH	pH units				-	-	-	-	-	-
Temperature	°C				-	-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-
Depth to Water	m				-	-	-	-	-	-
Analyte										
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		<0.005	-	-	-	-	-
Cyanide, total	mg/L				-	<0.010	<0.010	-	-	-
Alkalinity (CaCO3)	mg/L	-	-		273	270	270	270	270	270
Dissolved Hardness (CaCO3)	mg/L	-	500		210	103	217	-	-	-
Hardness, Total (Total as CaCO3)	mg/L				-	-	-	225	208	222
Bromide	mg/L				-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.6	2.5	1.2	1.6	2.0	1.6
Fluoride	mg/L				-	-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	147	141	142	135	133	129
Conductivity	uS/cm	-	700		751	773	756	762	760	760
Specific Conductance	uS/cm				-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		0.05	<0.03	<0.03	<0.03	<0.03	<0.03
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.528	0.420	0.560	0.520	0.220	0.340
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate+Nitrite (N)	mg/L				-	0.424	0.555	0.523	0.464	0.341
Total Kjeldahl Nitrogen (N)	mg/L	-	-		0.136	0.330	0.260	-	-	-
Total Phosphorous (P)	mg/L	-	0.01		0.14	0.13	0.2	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		18	38	23	-	-	-
Total Dissolved Solids	mg/L				481	2	480	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.7	7.6	7.9	7.7	7.8	8
Volatiles										
Benzene	ug/L	40 (a)	5 (a)		<0.4	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-		<0.4	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-
Vinyl chloride	ug/L				<0.50	-	-	-	-	-
Dichloromethane	ug/L	98.1	-		<2.0	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-		<0.5	-	-	-	-	-
Volatiles Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-
Hydrocarbons										
EPH (C10-C19)	µg/L				-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-
Misc. Organics										
Chemical Oxygen Demand	mg/L	-	-		<20	<20	<20	<20	<20	<20
Biochemical Oxygen Demand	mg/L				-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L				0.82	2.00	1.80	-	-	-
Total Organic Carbon	mg/L				-	-	-	-	-	-
Phenols	mg/L	0.05			0.0011	-	-	-	-	-
Dissolved Metals										
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0054	0.0080	<0.005	<0.005	<0.005	0.0190
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.005	0.0003	<0.0001	0.0002	0.0002	0.0004
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00048	0.00070	0.00060	0.00050	<0.0005	0.00060
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0629	0.1310	0.0710	0.0670	0.0670	0.0710
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.05	0.02	0.051	0.062	0.062	0.065
Dissolved Cadmium (Cd)	mg/L	0.0018-0.0024 (Hardness 50-1,000 mg/L)	0.005, MAC	0.005 ⁽²⁾	0.000164	0.00005	0.00009	0.00005	0.00011	0.00007

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			BH 4A					
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	24-Apr-17	14-Jun-17	23-Jul-20	25-Aug-20	21-Oct-20	12-Nov-20
Date					Sample	Sample	Monitor	Monitor	Monitor	Monitor
Field										
Conductivity	µS/cm				-	-	570	556	669	648
pH	pH units				-	-	-	-	-	-
Temperature	°C				-	-	6.1	5.9	5.8	5.8
Dissolved Oxygen	mg/L				-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-
Depth to Water	m				-	-	16.42	16.3	16.12	15.98
Analyte										
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	270	260	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-	-
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	202	207	-	-	-	-
Bromide	mg/L	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.7	1.5	-	-	-	-
Fluoride	mg/L	-	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	139	148	-	-	-	-
Conductivity	uS/cm	-	700	-	760	765	-	-	-	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	<0.03	<0.03	-	-	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.462	0.160	-	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	-	-	-	-
Nitrate+Nitrite (N)	mg/L	-	-	-	0.462	0.157	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.7	7.8	-	-	-	-
Volatiles										
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L	-	-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-	-
Hydrocarbons										
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-	-
Misc. Organics										
Chemical Oxygen Demand	mg/L	-	-	-	<20	<20	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-
Dissolved Metals										
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	<0.0050	0.0066	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00021	0.00036	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	<0.00050	<0.00050	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0575	0.0653	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.00010	<0.00010	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.06	0.055	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.0018-0.0024 (Hardness 50-1,000 mg/L)	0.005, MAC	0.005 ⁽²⁾	0.000066	0.000066	-	-	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)				16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21	18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW							
Date					Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	
Field											
Conductivity	µS/cm				794	825	676	752	766	755	
pH	pH units				-	-	-	-	-	-	
Temperature	°C				5.8	5.8	6	6	6	5.8	
Dissolved Oxygen	mg/L				-	-	-	-	-	-	
ORP	mV				-	-	-	-	-	-	
Depth to Water	m				15.87	15.78	15.52	15.43	15.22	15	
Analyte											
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-	
Alkalinity (CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-	-	
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	
Bromide	mg/L	-	-	-	-	-	-	-	-	-	
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-	-	-	-	-	-	
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-	-	-	-	-	-	
Conductivity	uS/cm	-	700	-	-	-	-	-	-	-	
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-	-	
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-	-	-	-	-	-	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	-	-	-	-	-	
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-	-	-	-	-	-	
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-	
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	-	-	-	
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	-	-	-	-	-	
Volatiles											
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	-	-	-	
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-	-	
Styrene	µg/L	-	-	-	-	-	-	-	-	-	
Toluene	ug/L	0.5 (a)	-	-	-	-	-	-	-	-	
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-	-	
Xylene, o-	µg/L	-	-	-	-	-	-	-	-	-	
Xylenes, total	µg/L	-	-	-	-	-	-	-	-	-	
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-	-	
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-	-	
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-	-	
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-	-	
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-	-	
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-	-	
Hydrocarbons											
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	
VPHw	µg/L	-	-	-	-	-	-	-	-	-	
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-	-	
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-	-	
Misc. Organics											
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-	
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-	
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	-	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-	-	
Dissolved Cadmium (Cd)	mg/L	0.0018-0.0024 (Hardness 50-1,000 mg/L)	0.005, MAC	0.005 ⁽²⁾	-	-	-	-	-	-	

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)		
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW
Date				
Field				
Conductivity	µS/cm			
pH	pH units			
Temperature	°C			
Dissolved Oxygen	mg/L			
ORP	mV			
Depth to Water	m			
Analyte				
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	
Cyanide, total	mg/L			
Alkalinity (CaCO3)	mg/L	-	-	
Dissolved Hardness (CaCO3)	mg/L	-	500	
Hardness, Total (Total as CaCO3)	mg/L			
Bromide	mg/L			
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾
Fluoride	mg/L			
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾
Conductivity	uS/cm	-	700	
Specific Conductance	uS/cm			
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾
Nitrate+Nitrite (N)	mg/L			
Total Kjeldahl Nitrogen (N)	mg/L	-	-	
Total Phosphorous (P)	mg/L	-	0.01	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	
Total Dissolved Solids	mg/L			
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6
Volatiles				
Benzene	ug/L	40 (a)	5 (a)	
Ethylbenzene	µg/L			
Methyl t-butyl ether (MTBE)	µg/L			
Styrene	µg/L			
Toluene	ug/L	0.5 (a)	-	
Xylene, m- and p-	µg/L			
Xylene, o-	µg/L			
Xylenes, total	µg/L			
BTEX+Styrene, total	µg/L			
Vinyl chloride	ug/L			
Dichloromethane	ug/L	98.1	-	
1,4-dichlorobenzene	ug/L	26	-	
Volatile Organic Compounds Surrogates				
bromofluorobenzene, 4-	%			
difluorobenzene, 1,4-	%			
Hydrocarbons				
EPH (C10-C19)	µg/L			
EPH (C19-C32)	µg/L			
TEH (C10-C30), BC	µg/L			
VHw (C6-C10)	µg/L			
VPHw	µg/L			
Hydrocarbons Surrogates				
bromobenzotrifluoride, 2- (EPH surr)	%			
dichlorotoluene, 3,4-	%			
Misc. Organics				
Chemical Oxygen Demand	mg/L	-	-	
Biochemical Oxygen Demand	mg/L			
Dissolved Organic Carbon (C)	mg/L			
Total Organic Carbon	mg/L			
Phenols	mg/L	0.05		
Dissolved Metals				
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾
Dissolved Bismuth (Bi)	mg/L	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾
Dissolved Cadmium (Cd)	mg/L	0.0018-0.0024 (Hardness 50-1,000 mg/L)	0.005, MAC	0.005 ⁽²⁾

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16
Date					Sample	Sample	Sample	Sample	Sample	Sample
Field										
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	57	29	58	59	56	57
Dissolved Cesium (Cs)	mg/L			-						
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.0050	0.0141	0.00019	<0.00005	<0.00005	<0.00005
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00060	0.00490	0.00090	0.00140	0.00090	0.00090
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.01	4.25	<0.010	<0.010	<0.010	<0.010
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0002	<0.0001	<0.0001	0.0002	<0.0001	<0.0001
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.005	0.0026	0.0012	0.0013	0.0012	0.0013
Dissolved Magnesium (Mg)	mg/L	-	700	-	16.6	7.3	17.5	18.9	16.8	19.3
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0011	3.1700	0.0512	0.0003	0.0034	0.0009
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00001	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0043	0.0007	0.0036	0.0037	0.0037	0.0035
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	<0.001	0.0181	0.0009	0.0006	0.0004	0.0013
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.035	<0.02	<0.02	0.040	0.030	0.040
Dissolved Potassium (K)	mg/L	373-432	-	-	1.74	1.85	1.76	1.85	1.63	1.86
Dissolved Rubidium (Rb)	mg/L			-						
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00086	0.00060	0.00120	0.00170	0.00130	0.00160
Dissolved Silicon (Si)	mg/L	-	-	-	4.00	8.70	3.60	4.40	4.40	4.30
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	89.0	7.5	98.5	106.0	95.7	106.0
Dissolved Strontium (Sr)	mg/L	-	-	-	0.821	0.133	0.750	0.792	0.751	0.868
Dissolved Sulphur (S)	mg/L	-	-	-	40.4	2.0	46.0	53.0	46.0	54.0
Dissolved Tellurium (Te)	mg/L			-						
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	0.00002
Dissolved Thorium (Th)	mg/L			-						
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00370	0.00007	0.00351	0.00338	0.00363	0.00357
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.005	0.024	<0.004	<0.004	<0.004	<0.004
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			BH 4A					
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	24-Apr-17	14-Jun-17	23-Jul-20	25-Aug-20	21-Oct-20	12-Nov-20
Date					Sample	Sample	Monitor	Monitor	Monitor	Monitor
Field										
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	54	55	-	-	-	-
Dissolved Cesium (Cs)	mg/L									
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00050	<0.00050	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.00010	<0.00010	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00075	0.00065	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	<0.010	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.00010	<0.00010	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.00109	0.00121	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	16.2	16.8	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0004	0.0051	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00002	<0.00002	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0034	0.0033	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00052	0.00596	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	1.71	1.85	-	-	-	-
Dissolved Rubidium (Rb)	mg/L									
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00142	0.00155	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	4.10	4.60	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000050	<0.000050	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	94.2	94.9	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.702	0.797	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	44.8	49.5	-	-	-	-
Dissolved Tellurium (Te)	mg/L									
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000020	<0.000020	-	-	-	-
Dissolved Thorium (Th)	mg/L									
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00020	<0.00020	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.0050	<0.0050	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00338	0.00346	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.0010	<0.0010	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.0040	<0.0040	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00010	<0.00010	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water crit

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21	18-Jan-22
Date					Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field										
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water crit

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)		
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW
Date				
Field				
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-
Dissolved Cesium (Cs)	mg/L			-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾
Dissolved Magnesium (Mg)	mg/L	-	700	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-
Dissolved Potassium (K)	mg/L	373-432	-	-
Dissolved Rubidium (Rb)	mg/L			-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾
Dissolved Silicon (Si)	mg/L	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾
Dissolved Strontium (Sr)	mg/L	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-
Dissolved Tellurium (Te)	mg/L			-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-
Dissolved Thorium (Th)	mg/L			-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾
Dissolved Titanium (Ti)	mg/L	2	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾
Dissolved Uranium (U)	mg/L	0.3	20	0.020
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾
Dissolved Zirconium (Zr)	mg/L	-	-	-

Notes:

0.3	A shaded value means exceeded the freshwater aquatic life criteria
0.3	A shaded value means reading exceeded the drinking water quality criteria.
0.3	A shaded value means exceeded both the aquatic life and drinking water criteria.
0.3	A shaded value means reading had detection limit exceeding criteria.
0.3	A shaded value means reading had detection limit exceeding CSR Drinking Water crit

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)											
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	26-May-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17	30-May-18	11-Jul-18	
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample	
Field													
Conductivity	µS/cm				-	-	-	-	-	-	-	-	
pH	pH units				-	-	-	-	-	-	-	-	
Temperature	°C				-	-	-	-	-	-	-	-	
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-	-	
ORP	mV				-	-	-	-	-	-	-	-	
Depth to Water	m				-	-	-	-	-	-	-	-	
Analyte													
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	-	-	
Cyanide, total	mg/L				<0.010	-	-	-	-	-	-	-	
Alkalinity (CaCO3)	mg/L	-	-	-	120	63	190	84	19	120	290	404	
Dissolved Hardness (CaCO3)	mg/L	-	500	-	223	-	-	-	-	-	-	-	
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	47	163	70	9	103	354	355	
Bromide	mg/L				-	-	-	-	-	-	-	-	
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	1.1	<1.0	1.2	1.1	<1.0	1.0	0.6	1.2	
Fluoride	mg/L				-	-	-	-	-	-	-	-	
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	<1.0	<1.0	<1.0	1.3	1.9	<1.0	0.78	1.96	
Conductivity	µS/cm	-	700	-	228	122	352	170	43.1	240	-	-	
Specific Conductance	µS/cm				-	-	-	-	-	-	-	-	
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	<0.03	0.03	0.059	<0.03	<0.03	0.24	0.0136	0.048	
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	<0.01	0.012	0.450	<0.01	0.023	0.012	0.021	0.018	
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0010	<0.0010	
Nitrate+Nitrite (N)	mg/L				<0.010	0.012	0.037	<0.010	0.023	0.012	<0.022	<0.019	
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	1.020	-	-	-	-	-	-	-	
Total Phosphorous (P)	mg/L	-	0.01	-	0.34	-	-	-	-	-	-	-	
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	200	-	-	-	-	-	-	-	
Total Dissolved Solids	mg/L				11.4	-	-	-	-	-	-	-	
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	6.7	6.4	6.7	6.7	5.7	6.3	-	-	
Volatiles													
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	-	-	-	<0.00050	-	
Ethylbenzene	µg/L				-	-	-	-	-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	-	
Styrene	µg/L				-	-	-	-	-	-	-	-	
Toluene	ug/L	0.5 (a)	-	-	-	-	-	-	-	-	<0.00045	-	
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	-	
Xylene, o-	µg/L				-	-	-	-	-	-	-	-	
Xylenes, total	µg/L				-	-	-	-	-	-	-	-	
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-	-	
Vinyl chloride	ug/L				-	-	-	-	-	-	<0.00040	-	
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-	-	<0.0050	-	
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-	-	<0.0010	-	
Volatile Organic Compounds Surrogates													
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	-	
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	-	
Hydrocarbons													
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	-	
EPH (C10-C32)	µg/L				-	-	-	-	-	-	-	-	
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	-	
VPHw	µg/L				-	-	-	-	-	-	-	-	
Hydrocarbons Surrogates													
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	-	
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	-	
Misc. Organics													
Chemical Oxygen Demand	mg/L	-	-	-	63.00	64.00	59.00	65.00	<20	61.00	53.00	81.00	
Biochemical Oxygen Demand	mg/L				-	-	-	-	-	-	-	-	
Dissolved Organic Carbon (C)	mg/L				11.40	-	-	-	-	-	-	-	
Total Organic Carbon	mg/L				-	-	-	-	-	-	-	-	
Phenols	mg/L	0.05			-	-	-	-	-	-	-	-	
Dissolved Metals													
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0060	0.0410	0.0060	0.1670	0.0606	0.1400	0.0320	0.0125	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.0005	0.0001	0.0002	0.0004	<0.00010	0.00087	0.00027	0.00021	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	<0.0005	0.00130	0.00060	0.00290	<0.00050	0.00257	0.00372	0.00281	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0670	0.0290	0.0700	0.2380	0.0694	0.0501	0.1050	0.1120	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000050	<0.000050	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.059	0.005	0.011	0.033	0.02	0.006	<0.010	<0.010	
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.00029	0.00028	0.00096	0.00043	0.000439	0.000356	0.000124	0.000709	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	58	13	48	19	3	31	109	109	
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-	-	<0.00010	<0.00010	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0005	<0.0005	0.0006	0.0009	<0.00050	0.00057	0.00011	<0.00010	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	<0.00005	0.0113	0.00973	0.0119	0.00077	0.0158	0.00887	0.00731	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00250	0.00370	0.00410	0.04020	0.02260	0.00700	0.00243	0.00256	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	<0.010	4.51	0.103	10.9	0.214	10.1	5.51	3.86	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.0001	0.0005	<0.0001	0.0012	0.00016	0.00051	0.000181	0.000053	
Dissolved Lithium (Li)	mg/L				0.008 ⁽²⁾	0.0017	0.0038	0.0034	0.0056	0.00319	0.0034	0.0024	
Dissolved Magnesium (Mg)	mg/L	-	700	-	19.4	3.5	10.1	5.2	0.5	6.2	20.1	20.2	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0070	2.0600	3.3600	1.4900	0.1670	2.93	3.19	3.63	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000050	<0.000050	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.0042	0.0002	0.0008	0.0003	<0.00010	0.0003	0.0006	0.0007	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0009	0.0193	0.0195	0.0405	0.00707	0.0457	0.0227	0.0154	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.020	0.030	<0.02	0.060	<0.050	<0.050	<0.050	<0.050	

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			BH 4B - E252313							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	17-Apr-19	13-Aug-19	20-Nov-19	31-Mar-20	11-May-20	22-Jun-20	23-Jul-20	25-Aug-20
Date					Sample	Sample	Sample	Sample	Monitor	Dry Well	DRY	DRY
Field												
Conductivity	µS/cm				38	597	74.6	76	77	-	-	-
pH	pH units				6.35	7	6.83	6.4	-	-	-	-
Temperature	°C				3.7	5.9	5.3	1.3	4.6	-	-	-
Dissolved Oxygen	mg/L				5.7	14.5	5	5.4	-	-	-	-
ORP	mV				341.2	344.7	170.5	198.8	-	-	-	-
Depth to Water	m				1.37	14.43	1.32	1.5	2.54	-	-	-
Analyte												
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	-	32.1	271	40.4	91.5	-	-	-	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	-	-	-	84	-	-	-	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	-	19.7	190	23.9	-	-	-	-	-
Bromide	mg/L	-	-	-	-	-	<0.050	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	0.61	<2.5	0.6	<0.50	-	-	-	-
Fluoride	mg/L	-	-	-	0.226	<0.10	0.187	0.234	-	-	-	-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	1.07	137	1.89	<0.30	-	-	-	-
Conductivity	µS/cm	-	700	-	-	-	76.5	166	-	-	-	-
Specific Conductance	µS/cm	-	-	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	0.0491	<0.0050	0.058	0.0198	-	-	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	0.015	0.46	0.015	<0.0050	-	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	0.001	<0.0050	<0.0010	<0.0010	-	-	-	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	2.41	0.884	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	8.53	7.33	7.6	-	-	-	-
Volatiles												
Benzene	µg/L	40 (a)	5 (a)	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	0.5 (a)	-	-	-	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L	-	-	-	-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	µg/L	98.1	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	µg/L	26	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons												
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-	-	-	-
Misc. Organics												
Chemical Oxygen Demand	mg/L	-	-	-	73	<20	80	72	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	21	2.53	35.3	21.2	-	-	-	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-	-	-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.423	0.0728	0.44	0.115	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.0012	0.0002	0.00015	0.00013	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00288	0.00074	0.00198	0.00619	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.017	0.0821	0.0209	0.0349	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	0.00012	<0.000100	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	0.052	<0.010	<0.010	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.000139	0.000193	0.00207	0.0000215	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	5.68	50.3	6.87	25.4	-	-	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.00088	0.00016	0.00081	0.00075	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00433	0.00052	0.00488	0.00989	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00693	0.00164	0.0213	0.00162	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	11.4	0.251	3.64	15.9	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000846	0.000265	0.00097	0.000365	-	-	-	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	0.0032	0.0013	0.004	0.0028	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	1.35	15.7	1.65	5.01	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.672	0.0454	0.525	1.44	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.0000086	<0.0000050	0.0000103	<0.0000050	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000432	0.00284	0.000184	0.000359	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0133	0.00125	0.0202	0.0202	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.198	0.055	0.067	0.104	-	-	-	-

Table 2. Hazelton Groundwater Quality Data

Parameters	Units	BC MoE Guidelines (a)			18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	
Date					Monitor
Field					
Conductivity	µS/cm				67.24
pH	pH units				7.3
Temperature	°C				2.6
Dissolved Oxygen	mg/L				3.8
ORP	mV				107.9
Depth to Water	m				1.97
Analyte					
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-
Cyanide, total	mg/L	-	-	-	-
Alkalinity (CaCO3)	mg/L	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-
Bromide	mg/L	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-
Fluoride	mg/L	-	-	-	-
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-
Conductivity	µS/cm	-	700	-	-
Specific Conductance	µS/cm	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-
Volatiles					
Benzene	µg/L	40 (a)	5 (a)	-	-
Ethylbenzene	µg/L	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-
Styrene	µg/L	-	-	-	-
Toluene	µg/L	0.5 (a)	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-
Xylene, o-	µg/L	-	-	-	-
Xylenes, total	µg/L	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-
Dichloromethane	µg/L	98.1	-	-	-
1,4-dichlorobenzene	µg/L	26	-	-	-
Volatile Organic Compounds Surrogates					
bromofluorobenzene, 4-	%	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-
Hydrocarbons					
EPH (C10-C19)	µg/L	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-
VPHw	µg/L	-	-	-	-
Hydrocarbons Surrogates					
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-
Misc. Organics					
Chemical Oxygen Demand	mg/L	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-
Phenols	mg/L	0.05	-	-	-
Dissolved Metals					
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	26-May-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17	30-May-18	11-Jul-18
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Field												
Dissolved Potassium (K)	mg/L	373-432	-	-	2.26	0.62	1.85	1.35	0.25	1.20	2.05	2.80
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-	0.00	0.00
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00210	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	0.00011	0.00011
Dissolved Silicon (Si)	mg/L	-	-	-	4.70	7.70	8.70	7.90	5.10	8.60	6.13	5.99
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	0.00002	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	105.0	7.0	8.8	11.2	6.1	10.1	11.2	12.3
Dissolved Strontium (Sr)	mg/L	-	-	-	0.820	0.064	0.237	0.112	0.021	0.161	0.483	0.532
Dissolved Sulphur (S)	mg/L	-	-	-	56.0	<1	2.0	<1	<3.0	<3.0	<0.50	0.8
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.00002	0.00002	0.00005	0.00002	<0.000020	0.000031	0.000018	0.000021
Dissolved Thorium (Th)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	0.0003	<0.00010	0.00018	<0.00010	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	0.00245	0.00149
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0030	0.00035
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	-	-	-	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00352	0.00009	0.00046	0.00040	0.00006	0.00044	0.00247	0.00177
Dissolved Vanadium (V)	mg/L	0.006	-	0.020 ⁽²⁾	<0.001	<0.001	<0.001	0.002	<0.0010	0.0013	0.00141	0.0008
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.005	0.007	0.007	0.12	0.0819	0.0132	0.0048	0.0124
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.0001	0.0007	0.0002	0.0012	0.0004	0.00099	0.000864	0.000481

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			BH 4B - E252313							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	17-Apr-19	13-Aug-19	20-Nov-19	31-Mar-20	11-May-20	22-Jun-20	23-Jul-20	25-Aug-20
Date					Sample	Sample	Sample	Sample	Monitor	Dry Well	DRY	DRY
Field												
Dissolved Potassium (K)	mg/L	373-432	-	-	0.41	1.59	0.741	0.856	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				0.00039	0.00035	0.00058	0.00038	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000152	0.00113	0.000158	0.000166	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	5.86	4	7.45	6.62	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	0.000057	<0.000010	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	7.57	87.3	9.71	10.1	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.0337	0.725	0.0398	0.123	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	45.2	1	<0.50	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	0.000011	0.000015	<0.000010	-	-	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	0.00044	<0.00010	0.00079	0.00023	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.00011	0.00016	0.00013	<0.00010	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	0.0191	0.00243	0.00888	0.00365	-	-	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000598	0.00337	0.00072	0.000163	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00282	0.00068	0.00242	0.00374	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0051	0.0068	0.0103	0.0029	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00202	<0.00020	0.00153	0.00181	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21
Date					9-Sep-20	21-Oct-20	12-Nov-20	16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21
Field					DRY	DRY	Monitor	Monitor	Monitor	Monitor	Monitor	Sample
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-	-	-	0.427
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-	-	0.00082
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	0.000104
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-	-	-	6.36
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-	-	0.000015
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-	-	12.0
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-	-	0.0714
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-	-	-	<0.50
Dissolved Tellurium (Te)	mg/L				-	-	-	-	-	-	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-	-	-	0.000019
Dissolved Thorium (Th)	mg/L				-	-	-	-	-	-	-	0.00028
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-	-	-	0.00013
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-	-	-	0.0125
Dissolved Tungsten (W)	mg/L				0.003 ⁽²⁾	-	-	-	-	-	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-	-	0.000721
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-	-	0.00277
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-	-	0.0092
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	0.00105

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	
Date					Monitor
Field					
Dissolved Potassium (K)	mg/L	373-432	-	-	-
Dissolved Rubidium (Rb)	mg/L			-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-
Dissolved Silicon (Si)	mg/L	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-
Dissolved Tellurium (Te)	mg/L			-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-
Dissolved Thorium (Th)	mg/L			-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Table 2. Hazelton Groundwater Quality Data

Date	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	21-Mar-03	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17
Field					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Conductivity	µS/cm				-	-	-	-	-	-	-	1747
pH	pH units				-	-	-	-	-	-	-	6.4
Temperature	°C				-	-	-	-	-	-	-	4.8
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-	-	-
Depth to Water	m				-	-	-	-	-	-	-	2.26
Analyte												
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	<0.005	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	<0.010	<0.010	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	471	784	540	800	710	910	330	560	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	756	239	853	-	-	-	-	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	-	-	-	-	885	898	502	608	-
Bromide	mg/L	-	-	-	<0.1	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	98	140	114	177	204	198	259	243
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	-	-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	46.4	3.51	5.5	10.4	2	2.2	21.6	1.1
Conductivity	µS/cm	-	700	-	-	1700	128	1880	1740	1990	1360	1650
Specific Conductance	µS/cm	-	-	-	1170	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	0.03	0.29	<0.03	0.29	<0.03	<0.03	0.042	<0.03	<0.03
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-	<0.02	0.01	<0.01	0.014	<0.01	0.029	<0.01
Nitrite (N)	mg/L	0.06-0.6 (b)	1.0 MAC	1.0 ⁽²⁾	<0.002	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	<0.01
Nitrate+Nitrite (N)	mg/L	-	-	-	0.003	-	0.013	<0.010	0.014	<0.010	0.029	<0.010
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	0.35	1.06	0.58	2.63	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	0.33	0.42	0.35	3.2	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	340	200	430	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	928	16.4	1000	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-	7.1	6.9	7.3	6.8	6.9	7.2	6.5
Volatiles												
Benzene	ug/L	40 (a)	5 (a)	-	-	<0.4	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	ug/L	-	-	-	-	-	-	-	-	-	-	-
Styrene	ug/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	<0.4	-	-	-	-	-	-
Xylene, m- and p-	ug/L	-	-	-	-	-	-	-	-	-	-	-
Xylene, o-	ug/L	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	ug/L	-	-	-	-	-	-	-	-	-	-	-
BTEX+Styrene, total	ug/L	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	<0.50	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	<2.0	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	<0.5	-	-	-	-	-	-
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons												
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-	-	-	-
Misc. Organics												
Chemical Oxygen Demand	mg/L	-	-	-	35	62	59	164	58	49	48	60
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	10.8	16.4	21.3	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-
Phenols	mg/L	0.05	-	-	-	0.0065	-	-	-	-	-	-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0042	<0.003	<0.005	<0.005	<0.005	<0.005	0.007	<0.0050
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.000175	<0.005	0.0005	0.0002	0.0003	0.0003	0.0006	0.00041
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.0005	0.00346	<0.0005	0.0102	0.0041	0.0024	0.0041	0.0023
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.134	0.179	0.032	0.336	0.196	0.179	0.639	0.281
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	<0.05	0.07	0.024	0.014	0.015	0.048	0.027
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.00042	0.000041	0.00032	0.00002	0.00001	0.0001	0.00027	0.000089
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	205	70.1	220	228	236	126	162
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.0002	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00226	0.0134	<0.00005	0.0121	0.0183	0.0368	0.0108	0.013
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00164	<0.0050	0.0027	0.0014	0.0014	<0.0002	0.0133	0.0267
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	0.109	<0.010	13	15.8	0.017	2.25	5.1
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.00001	<0.0002	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.00010
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	<0.00005	<0.005	0.0018	0.0031	0.0025	0.0033	0.0025	0.00207
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	59	15.6	74.1	76.5	75.2	45.3	49.5
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	1.32	4.57	0.0135	5.35	5.98	5.96	2.38	5.07
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.00001	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Dissolved Molybdenum (Mo)	mg/L	2	-	0.25 ⁽²⁾	0.00172	0.0036	0.0063	0.0073	0.0019	0.0025	0.0016	0.00159
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00753	0.0141	0.0008	0.0173	0.0233	0.0306	0.0284	0.0183
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.01	0.03	<0.02	<0.02	<0.02	<0.02	<0.050

Table 2. Hazelton Groundwater Quality Data

Date	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	14-Jun-17	31-Aug-17	28-May-18	30-May-18	11-Jul-18	11-Sep-18	17-Apr-19
Field					Sample	Monitor	Monitor	Sample	Sample	Sample	Sample
Conductivity	µS/cm				1510	194	780	-	1409	1154	939
pH	pH units				6.4	6.9	-	-	-	-	6.6
Temperature	°C				5.6	8.7	4.7	-	6	7.5	5.2
Dissolved Oxygen	mg/L				-	-	-	-	-	-	2.1
ORP	mV				-	-	-	-	-	-	317.9
Depth to Water	m				2.55	4.15	1.12	-	3.82	4.29	2.36
Analyte											
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	560	-	-	232	795	801	650	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	-	-	-	-	-	-	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	665	-	-	311	892	825	716	-
Bromide	mg/L	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	236	-	-	21.4	2.44	205	163
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	<0.10
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	1.4	-	-	23.3	<3.0	5.2	37.5
Conductivity	µS/cm	-	700	-	1620	-	-	-	-	-	-
Specific Conductance	µS/cm	-	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	<0.03	-	-	0.0302	0.0217	0.0486	0.0374
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	<0.01	-	-	<0.0050	<0.050	<0.050	<0.025
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.01	-	-	<0.0010	<0.010	<0.010	<0.0050
Nitrate+Nitrite (N)	mg/L	-	-	-	<0.010	-	-	<0.006	<0.060	<0.060	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	6.8	-	-	-	-	7.73	-
Volatiles											
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	<0.00050	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	0.00291	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	-	-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L	-	-	-	-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	<0.0004	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	<0.0050	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	<0.0010	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%	-	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L	-	-	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-	-
VHW (C6-C10)	µg/L	-	-	-	-	-	-	-	-	-	-
VPHw	µg/L	-	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	-	-	-	-
Misc. Organics											
Chemical Oxygen Demand	mg/L	-	-	-	60	-	-	220	50	31	35
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	13.1
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0154	-	-	0.0076	0.0054	0.0024	0.018
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00056	-	-	0.00015	0.00031	0.00023	0.00026
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00394	-	-	0.00111	0.00918	0.0113	0.0057
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.155	-	-	0.0658	0.289	0.288	0.246
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	-	-	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.00010	-	-	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.014	-	-	0.015	0.01	0.015	0.016
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.000051	-	-	0.000019	0.000117	<0.0000050	0.0000198
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	180	-	-	71.1	229	205	183
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00050	-	-	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.013	-	-	0.011	0.00645	0.00301	0.00958
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00024	-	-	0.00235	0.0005	0.00026	0.0004
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	10.7	-	-	0.02	10.9	12.4	7.42
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.00010	-	-	0.000089	<0.000050	<0.000050	<0.000050
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	0.00237	-	-	0.002	0.0028	0.0029	0.0021
Dissolved Magnesium (Mg)	mg/L	-	700	-	52.5	-	-	32.4	77.6	76	63.1
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	5.81	-	-	1.74	5.01	4.51	1.83
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.00002	-	-	8.2E-06	<0.0000050	<0.0000050	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00038	-	-	0.00038	0.00105	0.00108	0.00093
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0195	-	-	0.00381	0.00811	0.00513	0.0141
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	-	-	<0.050	<0.050	0.111	<0.050

Table 2. Hazelton Groundwater Quality Data

Date	Units	BC MoE Guidelines (a)			BH-5B - E252314						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	13-Aug-19	20-Nov-19	30-Mar-20	22-Jun-20	23-Jul-20	25-Aug-20	9-Sep-20
Field					Sample	Sample	Sample	Sample	Monitor	Sample	Monitor
Conductivity	µS/cm				1031	1164	826	607	923	918	841
pH	pH units				6.64	6.67	6.79	6.68	-	6.51	-
Temperature	°C				8.7	7.9	4	6.1	6.6	8.1	9.8
Dissolved Oxygen	mg/L				0.9	3	5.9	6.3	-	3.6	-
ORP	mV				109.2	138.2	32.1	190.4	-	304.2	-
Depth to Water	m				2.78	2.19	1.06	2.65	3.28	2.26	2.57
Analyte											
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-	-
Alkalinity (CaCO ₃)	mg/L	-	-	-	452	592	570	565	-	380	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500	-	-	-	750	711	-	636	-
Hardness, Total (Total as CaCO ₃)	mg/L	-	-	-	614	719	-	-	-	-	-
Bromide	mg/L	-	-	-	-	1.31	-	1.41	-	1.31	-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	226	215	210	221	-	212	-
Fluoride	mg/L	-	-	-	<0.10	<0.10	<0.200	<0.200	-	0.108	-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	7.8	2	<3.00	14.4	-	17.9	-
Conductivity	uS/cm	-	700	-	-	1570	1620	1540	-	1350	-
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	0.0285	0.078	0.0808	0.0527	-	0.0399	-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	<0.025	<0.025	<0.0500	<0.0500	-	<0.0250	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.0050	<0.0050	<0.0100	<0.0100	-	<0.0050	-
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	-	1.61	0.675	0.588	-	0.51	-
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	1070	-	-	-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.94	8.01	8	7.15	-	7.25	-
Volatiles											
Benzene	ug/L	40 (a)	5 (a)	-	-	-	-	<0.50	-	<0.50	-
Ethylbenzene	µg/L	-	-	-	-	-	-	<0.50	-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	<0.50	-	<0.50	-
Styrene	µg/L	-	-	-	-	-	-	<0.50	-	<0.50	-
Toluene	ug/L	0.5 (a)	-	-	-	-	-	<0.50	-	<0.50	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	<0.50	-	<0.50	-
Xylene, o-	µg/L	-	-	-	-	-	-	<0.50	-	<0.50	-
Xylenes, total	µg/L	-	-	-	-	-	-	<0.75	-	<0.75	-
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	<1.5	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-	-	-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%	-	-	-	-	-	-	108	-	92.6	-
difluorobenzene, 1,4-	%	-	-	-	-	-	-	100	-	104	-
Hydrocarbons											
EPH (C10-C19)	µg/L	-	-	-	-	-	-	<250	-	<250	-
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L	-	-	-	-	-	-	<250	-	<250	-
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	<250	-	-	-
VHw (C6-C10)	µg/L	-	-	-	-	-	-	<100	-	<100	-
VPHw	µg/L	-	-	-	-	-	-	<100	-	<100	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	-	-	-	89.3	-	97.6	-
dichlorotoluene, 3,4-	%	-	-	-	-	-	-	89.6	-	87.3	-
Misc. Organics											
Chemical Oxygen Demand	mg/L	-	-	-	47	31	66	58	-	64	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	10.1	9.35	18.1	13.6	-	7.37	-
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0098	0.0072	0.0037	0.12	-	0.0763	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00021	0.00011	0.00055	0.00039	-	0.00047	-
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	0.00626	0.00773	0.0173	0.0149	-	0.00460	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.252	0.281	0.333	0.307	-	0.228	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	<0.000100	<0.000100	-	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.012	0.015	0.014	0.014	-	0.010	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 5.0-1000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.0000295	0.0000611	<0.0000050	3.73E-05	-	0.000116	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	154	188	187	181	-	172	-
Dissolved Cesium (Cs)	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	0.000017	-	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.00011	<0.00010	<0.00010	0.0001	-	<0.00010	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00483	0.00409	0.00341	0.00394	-	0.00582	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00041	0.00116	<0.00020	0.00077	-	0.00059	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	7.06	12.2	15.3	9.95	-	9.75	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000089	0.000054	<0.000050	0.000188	-	0.000150	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	0.0023	0.0024	0.0033	0.003	-	0.0026	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	55.8	60.6	68.7	62.8	-	50.2	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	2.98	3.62	4.08	3.15	-	1.35	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.000062	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000282	0.00025	0.00463	0.00233	-	0.000924	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0043	0.00332	0.00644	0.00768	-	0.0118	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.135	0.145	0.113	0.082	-	0.055	-

Table 2. Hazelton Groundwater Quality Data

Date	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	21-Oct-20	12-Nov-20	16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21	
Field					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Sample
Conductivity	µS/cm				1096	1038	1231	905	1492	1365		1653
pH	pH units				6.69	-	-	-	-	-		6.74
Temperature	°C				8.7	8.4	6.9	5.1	5.2	8		8.3
Dissolved Oxygen	mg/L				7.4	-	-	-	-	-		4.3
ORP	mV				273.4	-	-	-	-	-		179.5
Depth to Water	m				2.31	0.51	2.17	2.33	2.27	2.81		3.31
Analyte												
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	-	-	-	-	-	-	-		-
Cyanide, total	mg/L	-	-	-	-	-	-	-	-	-		-
Alkalinity (CaCO3)	mg/L	-	-	-	535	-	-	-	-	-		630
Dissolved Hardness (CaCO3)	mg/L	-	500	-	713	-	-	-	-	-		766
Hardness, Total (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-		-
Bromide	mg/L	-	-	-	1.78	-	-	-	-	-		-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	226	-	-	-	-	-		209
Fluoride	mg/L	-	-	-	<0.100	-	-	-	-	-		<0.100
Sulfate (SO4)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	3.32	-	-	-	-	-		1.76
Conductivity	uS/cm	-	700	-	1620	-	-	-	-	-		1710
Specific Conductance	uS/cm	-	-	-	-	-	-	-	-	-		-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline	-	0.0268	-	-	-	-	-		0.108
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	<0.0250	-	-	-	-	-		<0.0250
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	<0.0050	-	-	-	-	-		0.0011
Nitrate+Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-		-
Total Kjeldahl Nitrogen (N)	mg/L	-	-	-	0.282	-	-	-	-	-		0.527
Total Phosphorous (P)	mg/L	-	0.01	-	-	-	-	-	-	-		-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-		-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-		-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	7.11	-	-	-	-	-		7.02
Volatiles												
Benzene	ug/L	40 (a)	5 (a)	-	<0.50	-	-	-	-	-		<0.50
Ethylbenzene	µg/L	-	-	-	<0.50	-	-	-	-	-		<0.50
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	<0.50	-	-	-	-	-		<0.50
Styrene	µg/L	-	-	-	<0.50	-	-	-	-	-		<0.50
Toluene	ug/L	0.5 (a)	-	-	<0.50	-	-	-	-	-		<0.50
Xylene, m- and p-	µg/L	-	-	-	<0.50	-	-	-	-	-		<0.40
Xylene, o-	µg/L	-	-	-	<0.50	-	-	-	-	-		<0.30
Xylenes, total	µg/L	-	-	-	<0.75	-	-	-	-	-		<0.50
BTEX+Styrene, total	µg/L	-	-	-	-	-	-	-	-	-		-
Vinyl chloride	ug/L	-	-	-	-	-	-	-	-	-		-
Dichloromethane	ug/L	98.1	-	-	-	-	-	-	-	-		-
1,4-dichlorobenzene	ug/L	26	-	-	-	-	-	-	-	-		-
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%	-	-	-	89.7	-	-	-	-	-		97.1
difluorobenzene, 1,4-	%	-	-	-	93.1	-	-	-	-	-		96.3
Hydrocarbons												
EPH (C10-C19)	µg/L	-	-	-	<250	-	-	-	-	-		<250
EPH (C10-C32)	µg/L	-	-	-	-	-	-	-	-	-		<400
EPH (C19-C32)	µg/L	-	-	-	<250	-	-	-	-	-		<250
TEH (C10-C30), BC	µg/L	-	-	-	-	-	-	-	-	-		-
VHw (C6-C10)	µg/L	-	-	-	<100	-	-	-	-	-		<100
VPHw	µg/L	-	-	-	<100	-	-	-	-	-		<100
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%	-	-	-	90.5	-	-	-	-	-		88.2
dichlorotoluene, 3,4-	%	-	-	-	84.8	-	-	-	-	-		73
Misc. Organics												
Chemical Oxygen Demand	mg/L	-	-	-	<20	-	-	-	-	-		32
Biochemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	-	-		-
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	-	-		-
Total Organic Carbon	mg/L	-	-	-	5.69	-	-	-	-	-		6.86
Phenols	mg/L	0.05	-	-	-	-	-	-	-	-		-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0031	-	-	-	-	-		0.0061
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00025	-	-	-	-	-		0.0020
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	0.00531	-	-	-	-	-		0.00850
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.248	-	-	-	-	-		0.270
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	-	-	-	-	-		<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	-	-	-	-	-		<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.013	-	-	-	-	-		0.011
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	0.0000169	-	-	-	-	-		0.0000192
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	192	-	-	-	-	-		206
Dissolved Cesium (Cs)	mg/L	-	-	-	<0.000010	-	-	-	-	-		<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.000010	-	-	-	-	-		<0.000050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	0.00533	-	-	-	-	-		0.00269
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00082	-	-	-	-	-		<0.00020
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	3.91	-	-	-	-	-		12.2
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	-	-	-	-	-		<0.000050
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	0.0028	-	-	-	-	-		0.0028
Dissolved Magnesium (Mg)	mg/L	-	700	-	57.0	-	-	-	-	-		61.2
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	2.76	-	-	-	-	-		3.85
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.000050	-	-	-	-	-		<0.000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000526	-	-	-	-	-		0.000267
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00940	-	-	-	-	-		0.00605
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.117	-	-	-	-	-		0.267

Table 2. Hazelton Groundwater Quality Data

Date	Units	BC MoE Guidelines (a)			18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	
Field					Monitor
Conductivity	µS/cm				1052
pH	pH units				6.85
Temperature	°C				5.5
Dissolved Oxygen	mg/L				0.7
ORP	mV				197.4
Depth to Water	m				3.03
Analyte					
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-		-
Cyanide, total	mg/L				-
Alkalinity (CaCO ₃)	mg/L				-
Dissolved Hardness (CaCO ₃)	mg/L	-	500		-
Hardness, Total (Total as CaCO ₃)	mg/L				-
Bromide	mg/L				-
Chloride (Cl)	mg/L	600, MAC	<250, AO	250 ⁽²⁾	-
Fluoride	mg/L				-
Sulfate (SO ₄)	mg/L	128-429 (d)	<500, AO	500 ⁽²⁾	-
Conductivity	uS/cm	-	700		-
Specific Conductance	uS/cm				-
Ammonia (N)	mg/L	1.98-26.5 (a)	no guideline		-
Nitrate (N)	mg/L	32.8	10 MAC	10 ⁽²⁾	-
Nitrite (N)	mg/L	0.06-0.6 (h)	1.0 MAC	1.0 ⁽²⁾	-
Nitrate+Nitrite (N)	mg/L				-
Total Kjeldahl Nitrogen (N)	mg/L	-	-		-
Total Phosphorous (P)	mg/L	-	0.01		-
Total Suspended Solids	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-
Total Dissolved Solids	mg/L				-
pH	pH units	6.5 - 9.0	6.5 - 8.5, AC	7.6	-
Volatiles					
Benzene	ug/L	40 (a)	5 (a)		-
Ethylbenzene	µg/L				-
Methyl t-butyl ether (MTBE)	µg/L				-
Styrene	µg/L				-
Toluene	ug/L	0.5 (a)	-		-
Xylene, m- and p-	µg/L				-
Xylene, o-	µg/L				-
Xylenes, total	µg/L				-
BTEX+Styrene, total	µg/L				-
Vinyl chloride	ug/L				-
Dichloromethane	ug/L	98.1	-		-
1,4-dichlorobenzene	ug/L	26	-		-
Volatile Organic Compounds Surrogates					
bromofluorobenzene, 4-	%				-
difluorobenzene, 1,4-	%				-
Hydrocarbons					
EPH (C10-C19)	µg/L				-
EPH (C10-C32)	µg/L				-
EPH (C19-C32)	µg/L				-
TEH (C10-C30), BC	µg/L				-
VHw (C6-C10)	µg/L				-
VPHw	µg/L				-
Hydrocarbons Surrogates					
bromobenzotrifluoride, 2- (EPH surr)	%				-
dichlorotoluene, 3,4-	%				-
Misc. Organics					
Chemical Oxygen Demand	mg/L	-	-		-
Biochemical Oxygen Demand	mg/L				-
Dissolved Organic Carbon (C)	mg/L				-
Total Organic Carbon	mg/L				-
Phenols	mg/L	0.05			-
Dissolved Metals					
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.005 ⁽²⁾	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-
Dissolved Cesium (Cs)	mg/L				-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.025 ⁽²⁾	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-

Date	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	21-Mar-03	7-Jul-14	26-May-15	16-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17
Field					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Dissolved Potassium (K)	mg/L	373-432	-	-	-	4.22	2.65	5.39	4.39	4.36	4.78	2.41
Dissolved Rubidium (Rb)	mg/L											
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.0003	<0.0001	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
Dissolved Silicon (Si)	mg/L	-	-	-	-	8.89	4.6	9.6	11.1	10.7	9.1	9.5
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.00002	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	77	105	115	111	105	113	94.8
Dissolved Strontium (Sr)	mg/L	-	-	-	0.981	1.61	0.892	1.67	1.68	1.69	1.06	1.04
Dissolved Sulphur (S)	mg/L	-	-	-	-	<3.0	75	1	<1	3	9	<3.0
Dissolved Tellurium (Te)	mg/L	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	0.000033	<0.00005	<0.00002	<0.00002	<0.00002	0.00004	<0.00002	<0.000020
Dissolved Thorium (Th)	mg/L	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.00007	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00253	0.00063	0.00231	0.0021	0.00047	0.00051	0.00235	0.000704
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00411	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0016	<0.005	<0.004	0.032	<0.004	0.005	0.211	0.0953
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.0005	<0.0001	0.0011	0.0002	0.0001	0.0002	0.00019

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Date	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	14-Jun-17	31-Aug-17	28-May-18	30-May-18	11-Jul-18	11-Sep-18	17-Apr-19
Field					Sample	Monitor	Monitor	Sample	Sample	Sample	Sample
Dissolved Potassium (K)	mg/L	373-432	-	-	2.5	-	-	2.13	3.58	3.37	3.26
Dissolved Rubidium (Rb)	mg/L							0.00032	0.00054	0.0005	0.00047
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.00050	-	-	0.000109	0.000106	0.000091	0.000401
Dissolved Silicon (Si)	mg/L	-	-	-	11.3	-	-	3.21	10.1	8.75	6.73
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000050	-	-	<0.000010	<0.000010	0.000028	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	94.5	-	-	12.4	106	95.7	89.9
Dissolved Strontium (Sr)	mg/L	-	-	-	1.23	-	-	0.713	1.68	1.7	1.55
Dissolved Sulphur (S)	mg/L	-	-	-	<3.0	-	-	8.84	1.22	3.06	19.5
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.00020	-	-	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	0.000021	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Dissolved Thorium (Th)	mg/L	-	-	-	<0.00010	-	-	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00020	-	-	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.0050	-	-	<0.00030	<0.00030	<0.00030	0.00033
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00108	-	-	0.000648	0.00175	0.00221	0.005
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.0010	-	-	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0054	-	-	0.002	0.0079	0.0017	0.0026
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00023	-	-	<0.000060	0.000536	0.000496	0.000286

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Date	Units	BC MoE Guidelines (a)			BH-5B - E252314						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	13-Aug-19	20-Nov-19	30-Mar-20	22-Jun-20	23-Jul-20	25-Aug-20	9-Sep-20
Field					Sample	Sample	Sample	Sample	Monitor	Sample	Monitor
Dissolved Potassium (K)	mg/L	373-432	-	-	3.32	3.59	3.52	3.45	-	3.76	-
Dissolved Rubidium (Rb)	mg/L				0.00066	0.0006	0.00054	0.00062	-	0.00107	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00233	0.000158	<0.000050	0.000107	-	0.000091	-
Dissolved Silicon (Si)	mg/L	-	-	-	7.83	8.51	8.69	8.26	-	7.63	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	87.9	84.9	83.1	79.7	-	79.4	-
Dissolved Strontium (Sr)	mg/L	-	-	-	1.27	1.55	1.64	1.49	-	1.18	-
Dissolved Sulphur (S)	mg/L	-	-	-	6.07	1.09	0.88	5.41	-	6.22	-
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	<0.000010	<0.000010	-	0.000052	-
Dissolved Thorium (Th)	mg/L	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.0001	0.00011	<0.00010	<0.00010	-	<0.00010	-
Dissolved Titanium (Ti)	mg/L	2	-	-	0.00031	<0.00030	<0.00030	<0.00030	-	0.00140	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00245	0.00137	0.00207	0.00441	-	0.00336	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00082	<0.00050	0.00090	0.00077	-	0.00100	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0016	0.0065	<0.0010	0.0027	-	0.0040	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00047	0.00039	0.00050	0.00041	-	0.00032	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Date	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	21-Oct-20	12-Nov-20	16-Dec-20	20-Jan-21	22-Apr-21	16-Jul-21	22-Oct-21
Field					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Sample
Dissolved Potassium (K)	mg/L	373-432	-	-	3.83	-	-	-	-	-	5.29
Dissolved Rubidium (Rb)	mg/L				0.00072	-	-	-	-	-	0.00108
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.000050	-	-	-	-	-	0.000111
Dissolved Silicon (Si)	mg/L	-	-	-	7.89	-	-	-	-	-	8.80
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	-	-	-	-	-	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	74.9	-	-	-	-	-	72.5
Dissolved Strontium (Sr)	mg/L	-	-	-	1.38	-	-	-	-	-	1.49
Dissolved Sulphur (S)	mg/L	-	-	-	2.04	-	-	-	-	-	<0.50
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.00020	-	-	-	-	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	0.000038	-	-	-	-	-	<0.000010
Dissolved Thorium (Th)	mg/L	-	-	-	<0.00010	-	-	-	-	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	-	-	-	-	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	-	-	-	-	-	<0.00030
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	<0.00010	-	-	-	-	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00245	-	-	-	-	-	0.000933
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	-	-	-	-	-	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0035	-	-	-	-	-	0.0022
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00020	-	-	-	-	-	<0.00020

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

Date	Units	BC MoE Guidelines (a)			18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	
Field					Monitor
Dissolved Potassium (K)	mg/L	373-432	-	-	-
Dissolved Rubidium (Rb)	mg/L				-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-
Dissolved Silicon (Si)	mg/L	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.
- 0.3 A shaded value means reading had detection limit exceeding CSR Drinking Water criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO₃

SGW - 01

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17	1-Aug-17	9-Aug-17	
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	
Field												
Conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	
pH	pH units	-	-	-	-	-	-	-	-	-	-	
Temperature	°C	-	-	-	-	-	-	-	-	-	-	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	
ORP	mV	-	-	-	-	-	-	-	-	-	-	
Water Elevation	m	-	-	-	-	-	-	-	-	-	-	
Analyte												
Alkalinity (Total as CaCO3)	mg/L	-	-	-	91	560	690	520	790	720	750	
Conductivity	uS/cm	-	700	-	185	1350	1660	1220	1860	1760	1780	
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-	-	-	
Total Hardness	mg/L	-	500 (i)	-	103	507	1050	712	1110	954	977	
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	6.8	6.6	6.4	6.8	6.4	6.5	6.5	
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	
Alkalinity (PP as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-	-	-	
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-	-	-	
Chemical Oxygen Demand	mg/L	-	-	-	83	770	944	902	900	681	570	
BOD	mg/L	-	-	-	6.9	230.000	590	200	430	390	390	
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	<1.0	1.2	<1.0	1.8	1.1	1.2	2.2	
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	2	122	123	132	152	145	152	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-	
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	0.14	0.33	1.04	0.4	0.54	0.53	0.43	
Bromide	mg/L	-	-	-	-	-	-	-	-	-	-	
Chloride	mg/L	-	-	-	-	-	-	-	-	-	-	
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	-	
Nitrate plus Nitrite (N)	mg/L	-	-	-	<0.010	0.0149	0.0107	0.0361	0.0832	0.0635	<0.0100	
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Nitrate (N)	mg/L	200 (max)	10 MAC	-	<0.01	0.015	0.011	0.036	0.083	0.064	<0.01	
Sulfate	mg/L	-	-	-	-	-	-	-	-	-	-	
Total Organic Carbon (C)	mg/L	-	4.0	-	26.8	89	395	136	279	224	210	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-	
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-	
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L	5, MAC	0.005 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-	-	-	
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-	-	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-	-	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-	
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-	-	-	
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Tellurium (Te)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-	-	-	
Dissolved Thorium (Th)	mg/L	-	-	-	-	-	-	-	-	-	-	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-	-	-	
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-	-	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-	-	
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	
Total Metals												
Total Aluminum (Al)	mg/L	0.1	0.2	-	0.40	18.40	11.50	88.10	30.30	11.00	5.17	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	-	0.00016	0.0005	0.0006	0.00105	0.00082	0.00045	0.00033	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	-	0.00381	0.0201	0.02	0.042	0.0245	0.0154	0.0168	
Total Barium (Ba)	mg/L	5	1.0, MAC	-	0.0325	0.44	0.479	1.08	0.637	0.385	0.31	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	-	<0.00010	0.00066	0.00029	0.00229	0.00073	0.00025	0.00012	
Total Bismuth (Bi)	mg/L	-	-	-	<0.00010	0.00012	<0.00010	0.00052	0.00018	<0.00010	<0.00010	

SGW - 01

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	16-Aug-17	5-Oct-17	23-Apr-18	1-May-18	8-May-18	11-May-18	14-May-18
Date					Sample	Sample	Monitor	Monitor	Monitor	Monitor	Monitor
Field											
Conductivity	µS/cm				-	-	1119	1278	1579	1278	1693
pH	pH units				-	-	-	-	-	-	-
Temperature	°C				-	-	3	5.4	5.2	5.4	6.9
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-	-
Water Elevation	m				-	-	0.7	1.1	0.8	1.1	0.8
Analyte											
Alkalinity (Total as CaCO3)	mg/L	-	-		770	-	-	-	-	-	-
Conductivity	uS/cm	-	700		1860	704	-	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		880	299	-	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.5	7	-	-	-	-	-
Turbidity	NTU				-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-		-	230	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-		-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-		-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-		-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-		350	160	-	-	-	-	-
BOD	mg/L	-	-		330	<38	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<1.0	51.7	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		142	58.1	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.39	0.08	-	-	-	-	-
Bromide	mg/L				-	-	-	-	-	-	-
Chloride	mg/L				-	-	-	-	-	-	-
Fluoride	mg/L				-	-	-	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-		0.0729	0.0296	-	-	-	-	-
Nitrite (N)	mg/L	0.06 - 0.6 (max) (c)	1.0 MAC		<0.01	<0.01	-	-	-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		0.073	0.03	-	-	-	-	-
Sulfate	mg/L				-	-	-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		152	68	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	5, MAC	0.005 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Metals											
Total Aluminum (Al)	mg/L	0.1	0.2		4.25	25.20	-	-	-	-	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		0.00034	0.00073	-	-	-	-	-
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.0146	0.0186	-	-	-	-	-
Total Barium (Ba)	mg/L	5	1.0, MAC		0.289	0.391	-	-	-	-	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		0.00012	0.00050	-	-	-	-	-
Total Bismuth (Bi)	mg/L	-	-		<0.00010	0.00019	-	-	-	-	-

SGW - 01

Parameters	Units	BC MoE Guidelines (a)			SGW-01 - E309746							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	10-Jul-18	31-Jul-18	7-Aug-18	13-Aug-18	11-Sep-18	22-Oct-18	2-Nov-18	
Date					Sample	Monitor	Monitor	Monitor	Sample	Monitor	Monitor	
Field												
Conductivity	µS/cm				1470	1226	1207	1215	1124	991	963	
pH	pH units				-	-	-	-	-	-	-	
Temperature	°C				9	16	12	11.3	13.2	8	8	
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-	
ORP	mV				-	-	-	-	-	-	-	
Water Elevation	m				1.1	1.1	1.3	1.2	1.1	0.5	0.8	
Analyte												
Alkalinity (Total as CaCO3)	mg/L	-	-		854	-	-	-	934	-	-	
Conductivity	uS/cm	-	700		-	-	-	-	-	-	-	
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-	-	-	
Total Hardness	mg/L	-	500 (i)		611	-	-	-	878	-	-	
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		-	-	-	-	-	-	-	
Turbidity	NTU				-	-	-	-	-	-	-	
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-	-	-	-	-	-	
Bicarbonate (HCO3)	mg/L	-	-		-	-	-	-	-	-	-	
Carbonate (CO3)	mg/L	-	-		-	-	-	-	-	-	-	
Hydroxide (OH)	mg/L	-	-		-	-	-	-	-	-	-	
Chemical Oxygen Demand	mg/L	-	-		672	-	-	-	255	-	-	
BOD	mg/L	-	-		-	-	-	-	-	-	-	
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<3.0	-	-	-	<3.0	-	-	
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		98.1	-	-	-	98.3	-	-	
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-	-	-	-	
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		1.28	-	-	-	1.2	-	-	
Bromide	mg/L				-	-	-	-	-	-	-	
Chloride	mg/L				-	-	-	-	-	-	-	
Fluoride	mg/L				-	-	-	-	-	-	-	
Nitrate plus Nitrite (N)	mg/L	-	-		<0.060	-	-	-	0.077	-	-	
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.010	-	-	-	0.013	-	-	
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.050	-	-	-	0.064	-	-	
Sulfate	mg/L				-	-	-	-	-	-	-	
Total Organic Carbon (C)	mg/L	-	4.0		245	-	-	-	75	-	-	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-	
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-	-	-	
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0217	-	-	-	0.16	-	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00050	-	-	-	<0.00050	-	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00448	-	-	-	0.0116	-	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.282	-	-	-	0.47	-	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00050	-	-	-	<0.00050	-	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.00025	-	-	-	<0.00025	-	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.127	-	-	-	0.212	-	-	
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	5, MAC	0.005 ⁽²⁾	0.0000	-	-	-	<0.000025	-	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	162	-	-	-	237	-	-	
Dissolved Cesium (Cs)	mg/L				<0.000050	-	-	-	<0.000050	-	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00050	-	-	-	0.00071	-	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.0037	-	-	-	0.0063	-	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	<0.0010	-	-	-	<0.0010	-	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	37.8	-	-	-	73	-	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.00025	-	-	-	<0.00025	-	-	
Dissolved Lithium (Li)	mg/L				0.008 ⁽²⁾	-	-	-	<0.0050	-	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	50	-	-	-	70	-	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	13.3	-	-	-	14.1	-	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.000050	-	-	-	<0.000050	-	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00112	-	-	-	0.00052	-	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.0026	-	-	-	0.0043	-	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.25	-	-	-	<0.25	-	-	
Dissolved Potassium (K)	mg/L	373-432	-	-	8.83	-	-	-	12.9	-	-	
Dissolved Rubidium (Rb)	mg/L				0.0011	-	-	-	0.0011	-	-	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.00025	-	-	-	<0.00025	-	-	
Dissolved Silicon (Si)	mg/L	-	-	-	8.360	-	-	-	12.000	-	-	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000050	-	-	-	<0.000050	-	-	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	32,2000	-	-	-	51,2000	-	-	
Dissolved Strontium (Sr)	mg/L	-	-	-	1.2700	-	-	-	1.7600	-	-	
Dissolved Sulphur (S)	mg/L	-	-	-	<2.5	-	-	-	<2.5	-	-	
Dissolved Tellurium (Te)	mg/L				<0.0010	-	-	-	<0.0010	-	-	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000050	-	-	-	<0.000050	-	-	
Dissolved Thorium (Th)	mg/L				<0.00050	-	-	-	<0.00050	-	-	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00050	-	-	-	<0.00050	-	-	
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.0015	-	-	-	<0.0045	-	-	
Dissolved Tungsten (W)	mg/L				0.003 ⁽²⁾	-	-	-	<0.00050	-	-	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000614	-	-	-	0.000581	-	-	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.0025	-	-	-	0.0	-	-	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.0050	-	-	-	0.01	-	-	
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.0	-	-	-	0.0	-	-	
Total Metals												
Total Aluminum	mg/L	0.1	0.2		-	-	-	-	-	-	-	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		-	-	-	-	-	-	-	
Total Arsenic (As)	mg/L	0.005	0.025 MAC		-	-	-	-	-	-	-	
Total Barium (Ba)	mg/L	5	1.0, MAC		-	-	-	-	-	-	-	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		-	-	-	-	-	-	-	
Total Bismuth (Bi)	mg/L	-	-		-	-	-	-	-	-	-	

SGW - 01

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20	11-May-20	25-Jun-20	23-Jul-20
Date					Sample	Sample	Sample	Well	Well	Well	Well
Field											
Conductivity	µS/cm				460	657	586	Broken	Broken	Broken	Broken
pH	pH units				6.72	6.29	6.81	-	-	-	-
Temperature	°C				3.9	15.1	4.5	-	-	-	-
Dissolved Oxygen	mg/L				1.2	0.8	1.8	-	-	-	-
ORP	mV				139.4	97.9	124.1	-	-	-	-
Water Elevation	m				0.95	0.5	1.09	-	-	-	-
Analyte											
Alkalinity (Total as CaCO3)	mg/L	-	-		237	382	481	-	-	-	-
Conductivity	uS/cm	-	700		-	-	915	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		205	296	457	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		-	7.78	8.14	-	-	-	-
Turbidity	NTU				-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-		-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-		-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-		-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-		91	80	71	-	-	-	-
BOD	mg/L	-	-		-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	6.19	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.257	0.292	0.335	-	-	-	-
Bromide	mg/L	-	-		-	0.064	<0.25	-	-	-	-
Chloride	mg/L	-	-		7.08	11.7	59.9	-	-	-	-
Fluoride	mg/L	-	-		0.154	0.138	<0.10	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-		-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.001	<0.0010	<0.0050	-	-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0050	<0.0050	<0.025	-	-	-	-
Sulfate	mg/L	-	-		7.28	6.42	11.3	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		14.1	9.48	24.4	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/L) (i)	-		-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	3.1	0.0153	0.0643	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00011	<0.00010	<0.00010	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00836	0.00466	0.00297	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.234	0.233	0.228	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	<0.00010	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.101	0.155	0.083	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L	5, MAC	0.005 ⁽²⁾	0.00053	<0.000050	0.0000094	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	61.5	86.6	117	-	-	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	0.000157	<0.000010	<0.000010	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.0035	<0.00010	0.00015	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00423	0.00146	0.00272	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.0131	0.00057	0.00107	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	59.3	28	34.4	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.00238	0.000058	0.000087	-	-	-	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	0.0025	<0.0010	0.0014	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	12.6	19.4	39.9	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	3.03	4	4.15	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.0000186	<0.0000050	<0.0000050	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000381	0.000384	0.000248	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00669	0.00091	0.00238	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.234	<0.050	<0.050	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	3.94	6.07	4.31	-	-	-	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	0.00133	0.0005	0.00032	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000423	0.000154	<0.000050	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	7.89	5.63	6.31	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	<0.000010	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	13.5	18	29.3	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.421	0.671	0.966	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	2.64	1.69	3.5	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	<0.00020	<0.00020	<0.00020	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	0.000014	<0.000010	<0.000010	-	-	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	0.00014	<0.00010	<0.00010	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	0.0001	<0.00010	0.00013	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	0.0468	0.00033	0.00107	-	-	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000289	0.000124	0.000541	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00844	<0.00050	<0.00050	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.204	0.0048	0.0094	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.000889	<0.00020	<0.00020	-	-	-	-
Total Metals											
Total Aluminum	mg/L	0.1	0.2		-	-	-	-	-	-	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		-	-	-	-	-	-	-
Total Arsenic (As)	mg/L	0.005	0.025 MAC		-	-	-	-	-	-	-
Total Barium (Ba)	mg/L	5	1.0, MAC		-	-	-	-	-	-	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		-	-	-	-	-	-	-
Total Bismuth (Bi)	mg/L	-	-		-	-	-	-	-	-	-

SGW - 01

Parameters	Units	BC MoE Guidelines (a)			26-Aug-20	9-Sep-20	22-Oct-20
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW			
Date					Well	Well	Well
Field					Broken	Broken	Broken
Conductivity	µS/cm				-	-	-
pH	pH units				-	-	-
Temperature	°C				-	-	-
Dissolved Oxygen	mg/L				-	-	-
ORP	mV				-	-	-
Water Elevation	m				-	-	-
Analyte							
Alkalinity (Total as CaCO3)	mg/L	-	-		-	-	-
Conductivity	uS/cm	-	700		-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-
Total Hardness	mg/L	-	500 (i)		-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		-	-	-
Turbidity	NTU				-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-	-
Bicarbonate (HCO3)	mg/L	-	-		-	-	-
Carbonate (CO3)	mg/L	-	-		-	-	-
Hydroxide (OH)	mg/L	-	-		-	-	-
Chemical Oxygen Demand	mg/L	-	-		-	-	-
BOD	mg/L	-	-		-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		-	-	-
Bromide	mg/L				-	-	-
Chloride	mg/L				-	-	-
Fluoride	mg/L				-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-		-	-	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		-	-	-
Sulfate	mg/L				-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-
Dissolved Metals							
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	5, MAC	0.005 ⁽²⁾	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-
Total Metals							
Total Aluminum	mg/L	0.1	0.2		-	-	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		-	-	-
Total Arsenic (As)	mg/L	0.005	0.025 MAC		-	-	-
Total Barium (Ba)	mg/L	5	1.0, MAC		-	-	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		-	-	-
Total Bismuth (Bi)	mg/L	-	-		-	-	-

SGW - 01

Parameters	Units	BC MoE Guidelines (a)		
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW
Date				
Field				
Conductivity	µS/cm			
pH	pH units			
Temperature	°C			
Dissolved Oxygen	mg/L			
ORP	mV			
Water Elevation	m			
Analyte				
Alkalinity (Total as CaCO3)	mg/L	-	-	
Conductivity	uS/cm	-	700	
Dissolved Hardness (CaCO3)	mg/L	-	500	
Total Hardness	mg/L	-	500 (i)	
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	
Turbidity	NTU			
Alkalinity (PP as CaCO3)	mg/L	-	-	
Bicarbonate (HCO3)	mg/L	-	-	
Carbonate (CO3)	mg/L	-	-	
Hydroxide (OH)	mg/L	-	-	
Chemical Oxygen Demand	mg/L	-	-	
BOD	mg/L	-	-	
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	
Total Kjeldahl Nitrogen	mg/L	-	-	
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	
Bromide	mg/L			
Chloride	mg/L			
Fluoride	mg/L			
Nitrate plus Nitrite (N)	mg/L	-	-	
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC	
Nitrate (N)	mg/L	200 (max)	10 MAC	
Sulfate	mg/L			
Total Organic Carbon (C)	mg/L	-	4.0	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	
Dissolved Metals				
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾
Dissolved Bismuth (Bi)	mg/L	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾
Dissolved Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	5, MAC	0.005 ⁽²⁾
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-
Dissolved Cesium (Cs)	mg/L			
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾
Dissolved Magnesium (Mg)	mg/L	-	700	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-
Dissolved Potassium (K)	mg/L	373-432	-	-
Dissolved Rubidium (Rb)	mg/L			
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾
Dissolved Silicon (Si)	mg/L	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾
Dissolved Strontium (Sr)	mg/L	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-
Dissolved Tellurium (Te)	mg/L			
Dissolved Thallium (Tl)	mg/L	0.0017	2	-
Dissolved Thorium (Th)	mg/L			
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾
Dissolved Titanium (Ti)	mg/L	2	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾
Dissolved Uranium (U)	mg/L	0.3	20	0.020
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾
Dissolved Zirconium (Zr)	mg/L	-	-	-
Total Metals				
Total Aluminum	mg/L	0.1	0.2	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	
Total Barium (Ba)	mg/L	5	1.0, MAC	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	
Total Bismuth (Bi)	mg/L	-	-	

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17	1-Aug-17	9-Aug-17	
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	
Field												
Total Boron (B)	mg/L	1.2	5.0, MAC		0.039	0.114	0.11	0.498	0.258	0.0995	0.1	
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		0.000042	0.000787	0.000359	0.00149	0.000614	0.000316	0.00055	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		30	124	273	162	287	246	241	
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00074	0.0203	0.0115	0.0971	0.0318	0.0145	0.0061	
Total Cobalt (Co)	mg/L	0.11	-		0.0019	0.0174	0.0337	0.0533	0.0388	0.0242	0.0223	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00208	0.0572	0.0229	0.21	0.0668	0.0243	0.0142	
Total Iron (Fe)	mg/L	1	<0.3, AO		1.08	35.40	43.10	124.00	69.70	44.10	36.60	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		<0.00010	0.00964	0.00401	0.0312	0.0115	0.00398	0.00221	
Total Lithium (Li)	mg/L	-	-		0.00017	0.0163	0.011	0.0711	0.0332	0.0108	0.00688	
Total Magnesium (Mg)	mg/L	-	700		6.9	47.8	88.7	74.7	95.4	82.1	90.9	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		1.14	5.89	22.7	8.9	19.7	16.9	16.7	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00002	<0.000020	<0.000020	0.000021	0.000039	0.00005	0.000018	
Total Molybdenum (Mo)	mg/L	2	0.25		0.00038	0.00064	0.00056	0.00165	0.00068	0.00061	0.00065	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.002	0.0369	0.0267	0.143	0.0541	0.0411	0.0163	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.072	1.210	0.649	3.790	1.310	0.573	0.381	
Total Potassium (K)	mg/L	373-432	-		2.44	7.94	11.5	16.5	12.3	8.3	8.38	
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.00050	<0.00050	<0.00050	0.00143	<0.00050	<0.00050	<0.00050	
Total Silicon (Si)	mg/L	-	-		6.2	32.4	24.2	111	49.5	26.1	19.2	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		<0.000050	0.000299	0.000156	0.000923	0.000384	0.000126	<0.000050	
Total Sodium (Na)	mg/L	-	<200, AO		3.96	48.2	51.4	75.6	59.1	53.9	57.5	
Total Strontium (Sr)	mg/L	-	-		0.175	1.04	2.1	1.25	2.11	1.86	1.84	
Total Sulphur (S)	mg/L	-	-		<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.000020	0.000086	0.000046	0.000319	0.000119	0.000037	<0.000020	
Total Thorium (Th)	mg/L	-	-		<0.00010	0.00051	0.00044	0.00242	0.00107	0.00052	0.00025	
Total Tin (Sn)	mg/L	-	-		<0.00020	0.00031	0.00029	0.00071	0.0004	0.0003	0.00021	
Total Titanium (Ti)	mg/L	2	0.1		0.0055	0.212	0.204	0.804	0.351	0.189	0.121	
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	
Total Uranium (U)	mg/L	0.3	20		0.000059	0.00318	0.00147	0.00844	0.00231	0.00167	0.00109	
Total Vanadium (V)	mg/L	0.006	0.02		0.0014	0.043	0.024	0.180	0.060	0.026	0.0123	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		<0.0040	0.0886	0.0472	0.347	0.13	0.0437	0.027	
Total Zirconium (Zr)	mg/L	-	-		0.00058	0.0022	0.0027	0.00723	0.00408	0.00262	0.00058	
Volatile Organic Compounds												
Benzene	µg/L				-	-	-	-	-	-	-	
Ethylbenzene	µg/L				-	-	-	-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	
Styrene	µg/L				-	-	-	-	-	-	-	
Toluene	µg/L				-	-	-	-	-	-	-	
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	
Xylene, o-	µg/L				-	-	-	-	-	-	-	
Xylenes, total	µg/L				-	-	-	-	-	-	-	
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-	
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	
Hydrocarbons												
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	
VPHw	µg/L				-	-	-	-	-	-	-	
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	16-Aug-17	5-Oct-17	23-Apr-18	1-May-18	8-May-18	11-May-18	14-May-18
Date					Sample	Sample	Monitor	Monitor	Monitor	Monitor	Monitor
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		0.0891	0.233	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		0.000098	0.000836	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		220	81.8	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00495	0.0282	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		0.0173	0.0185	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.0103	0.0779	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		30.20	37.60	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.0009	0.0128	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		0.00672	0.0168	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		80.4	22.9	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		14.6	3.11	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		0.00002	0.000041	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		0.00068	0.00201	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0129	0.0444	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.278	1.080	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		6.46	8.12	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.00050	0.0005	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		18.4	36.3	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000196	0.000331	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		49.4	35.6	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		1.8	0.495	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		<3.0	13.9	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		<0.00050	<0.00050	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		0.000028	0.000137	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		0.00041	0.00083	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		<0.00020	0.00034	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		0.104	0.308	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		0.0011	0.00172	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		0.0098	0.057	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0185	1.68	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		0.00047	0.00242	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	22-May-18	30-May-18	4-Jun-18	12-Jun-18	20-Jun-18	26-Jun-18	3-Jul-18
Date					Monitor	Sample	Monitor	Monitor	Monitor	Monitor	Monitor
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-0.153 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			SGW-01 - E309746						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	10-Jul-18	31-Jul-18	7-Aug-18	13-Aug-18	11-Sep-18	22-Oct-18	2-Nov-18
Date					Sample	Monitor	Monitor	Monitor	Sample	Monitor	Monitor
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW		16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20	11-May-20	25-Jun-20	23-Jul-20
Date					Sample	Sample	Sample	Well	Well	Well	Well	
Field												
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-	
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		-	-	-	-	-	-	-	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-	
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-	
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-	
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-	
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-	
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-	
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-	
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-	
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-	
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-	
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-	
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-	
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-	
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-	
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-	
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-	
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-	
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-	
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-	
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-	
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-	
Volatile Organic Compounds												
Benzene	µg/L				-	-	-	-	-	-	-	
Ethylbenzene	µg/L				-	-	-	-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	
Styrene	µg/L				-	-	-	-	-	-	-	
Toluene	µg/L				-	-	-	-	-	-	-	
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	
Xylene, o-	µg/L				-	-	-	-	-	-	-	
Xylenes, total	µg/L				-	-	-	-	-	-	-	
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-	
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	
Hydrocarbons												
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	
VPHw	µg/L				-	-	-	-	-	-	-	
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			26-Aug-20	9-Sep-20	22-Oct-20
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW			
Date							
Field					Well	Well	Well
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-
Total Lead (Pb)	mg/L	0.034-0.153 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-
Volatile Organic Compounds							
Benzene	µg/L				-	-	-
Ethylbenzene	µg/L				-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-
Styrene	µg/L				-	-	-
Toluene	µg/L				-	-	-
Xylene, m- and p-	µg/L				-	-	-
Xylene, o-	µg/L				-	-	-
Xylenes, total	µg/L				-	-	-
BTEX+Styrene, total	µg/L				-	-	-
Volatile Organic Compounds Surrogates							
bromofluorobenzene, 4-	%				-	-	-
difluorobenzene, 1,4-	%				-	-	-
Hydrocarbons							
EPH (C10-C19)	µg/L				-	-	-
EPH (C19-C32)	µg/L				-	-	-
TEH (C10-C30), BC	µg/L				-	-	-
VHw (C6-C10)	µg/L				-	-	-
VPHw	µg/L				-	-	-
Hydrocarbons Surrogates							
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-
dichlorotoluene, 3,4-	%				-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	12-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21	26-Oct-21	19-Jan-22
Field					Well	Well	Well	Well	Well	Well	Well
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-0.153 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)		
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW
Date				
Field				
Total Boron (B)	mg/L	1.2	5.0, MAC	
Total Cadmium (Cd)	mg/L	0.018-0.00024 (Hardness 50-1,000 mg/L)	0.005, MAC	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	
Total Cesium (Cs)	mg/L	-	-	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	
Total Cobalt (Co)	mg/L	0.11	-	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	
Total Iron (Fe)	mg/L	1	<0.3, AO	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	
Total Lithium (Li)	mg/L	-	-	
Total Magnesium (Mg)	mg/L	-	700	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	
Total Molybdenum (Mo)	mg/L	2	0.25	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	
Total Potassium (K)	mg/L	373-432	-	
Total Rubidium (Rb)	mg/L	-	-	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	
Total Silicon (Si)	mg/L	-	-	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	
Total Sodium (Na)	mg/L	-	<200, AO	
Total Strontium (Sr)	mg/L	-	-	
Total Sulphur (S)	mg/L	-	-	
Total Tellurium (Te)	mg/L	-	-	
Total Thallium (Tl)	mg/L	0.0017	0.002	
Total Thorium (Th)	mg/L	-	-	
Total Tin (Sn)	mg/L	-	-	
Total Titanium (Ti)	mg/L	2	0.1	
Total Tungsten (W)	mg/L	-	-	
Total Uranium (U)	mg/L	0.3	20	
Total Vanadium (V)	mg/L	0.006	0.02	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	
Total Zirconium (Zr)	mg/L	-	-	
Volatile Organic Compounds				
Benzene	µg/L			
Ethylbenzene	µg/L			
Methyl t-butyl ether (MTBE)	µg/L			
Styrene	µg/L			
Toluene	µg/L			
Xylene, m- and p-	µg/L			
Xylene, o-	µg/L			
Xylenes, total	µg/L			
BTEX+Styrene, total	µg/L			
Volatile Organic Compounds Surrogates				
bromofluorobenzene, 4-	%			
difluorobenzene, 1,4-	%			
Hydrocarbons				
EPH (C10-C19)	µg/L			
EPH (C19-C32)	µg/L			
TEH (C10-C30), BC	µg/L			
VHw (C6-C10)	µg/L			
VPHw	µg/L			
Hydrocarbons Surrogates				
bromobenzotrifluoride, 2- (EPH surr)	%			
dichlorotoluene, 3,4-	%			

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h. copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

SGW - 02

Parameters	Units	BC MoE Guidelines (a)										
		Freshwater Aquatic Life	Drinking Water	BC MOE	CSR-DW	14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17	1-Aug-17	9-Aug-17	16-Aug-17
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample
Field												
Conductivity	µS/cm				-	-	-	-	-	-	-	-
pH	pH units				-	-	-	-	-	-	-	-
Temperature	°C				-	-	-	-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-	-	-
Water Elevation	m				-	-	-	-	-	-	-	-
Analyte												
Alkalinity (Total as CaCO3)	mg/L	-	-		640	320	540	680	810	440	800	930
Conductivity	uS/cm	-	700		1580	685	1090	1360	1620	914	1630	1850
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		827	486	661	760	1020	461	1030	1050
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.7	6.7	6.6	6.7	6.5	6.6	6.4	6.5
Turbidity	NTU				-	-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-			-	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-			-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-			-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-			-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-			326	502	518	609	938	385	1100	1000
BOD	mg/L	-			170	76	200	340	530	210	640	630
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		2	<1.0	<1.0	<1.0	<1.0	1.4	1.3	<1.0
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		150	45.1	45.7	48.7	49.2	25.9	43.9	46.3
Total Kjeldahl Nitrogen	mg/L	-			-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.09	0.39	0.4	0.38	0.67	0.38	1.03	0.49
Bromide	mg/L				-	-	-	-	-	-	-	-
Chloride	mg/L				-	-	-	-	-	-	-	-
Fluoride	mg/L				-	-	-	-	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-			0.082	0.0596	0.014	<0.0100	0.0309	0.0132	0.0163	0.0174
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (N)	mg/L	200 (max)	10 MAC		0.082	0.06	0.014	<0.01	0.031	0.013	0.016	0.017
Sulfate	mg/L				-	-	-	-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		104.0	60	199	196	322	134	390	372
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)			-	-	-	-	-	-	-	-
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-			-	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)			-	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11		0.001 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)		0.08 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432			-	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-			-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-			-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-			-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-			-	-	-	-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2		-	-	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-	-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-		2.5 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2			-	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-			-	-	-	-	-	-	-	-
Total Metals												
Total Aluminum	mg/L	0.1	0.2		0.48	50.80	23.10	31.10	19.40	16.30	15.80	20.20
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		0.00015	0.00057	0.00067	0.00082	0.00071	0.00064	0.00067	0.00074
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.01	0.0239	0.028	0.032	0.032	0.0184	0.043	0.046
Total Barium (Ba)	mg/L	5	1.0, MAC		0.196	0.644	0.348	0.398	0.361	0.226	0.349	0.414
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.00010	0.00139	0.00059	0.00063	0.00045	0.0003	0.0004	0.00055
Total Bismuth (Bi)	mg/L	-			<0.00010	0.00044	0.00018	0.00018	0.00014	0.0001	0.00011	0.00016

SGW - 02

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	5-Oct-17	23-Apr-18	1-May-18	8-May-18	11-May-18	14-May-18	22-May-18
Date					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field											
Conductivity	µS/cm				-	2050	1953	1586	1953	1888	1586
pH	pH units				-	-	-	-	-	-	-
Temperature	°C				-	2.5	3.7	4.8	3.7	6.3	7.9
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-	-
Water Elevation	m				-	1.1	1.06	1.06	1.06	1.05	1.12
Analyte											
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Conductivity	uS/cm	-	700	705	-	-	-	-	-	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)	360	-	-	-	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	6.9	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-	240	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	291	-	-	-	-	-	-	-
BOD	mg/L	-	-	<38	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	7.4	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	87	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	0.09	-	-	-	-	-	-	-
Bromide	mg/L	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-	-	-	-	-	-
Fluoride	mg/L	-	-	-	-	-	-	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-	0.129	-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC	<0.01	-	-	-	-	-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC	0.13	-	-	-	-	-	-	-
Sulfate	mg/L	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0	67	-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Metals											
Total Aluminum	mg/L	0.1	0.2	67.00	-	-	-	-	-	-	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	0.00054	-	-	-	-	-	-	-
Total Arsenic (As)	mg/L	0.005	0.025, MAC	0.025	-	-	-	-	-	-	-
Total Barium (Ba)	mg/L	5	1.0, MAC	0.74	-	-	-	-	-	-	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.00137	-	-	-	-	-	-	-
Total Bismuth (Bi)	mg/L	-	-	0.00053	-	-	-	-	-	-	-

SGW - 02

Parameters	Units	BC MoE Guidelines (a)			Date	Monitor
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW		
Field						
Conductivity	µS/cm					Frozen
pH	pH units					-
Temperature	°C					-
Dissolved Oxygen	mg/L					-
ORP	mV					-
Water Elevation	m					-
Analyte						
Alkalinity (Total as CaCO3)	mg/L	-	-	-		-
Conductivity	uS/cm	-	700	-		-
Dissolved Hardness (CaCO3)	mg/L	-	500	-		-
Total Hardness	mg/L	-	500 (i)	-		-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-		-
Turbidity	NTU	-	-	-		-
Alkalinity (PP as CaCO3)	mg/L	-	-	-		-
Bicarbonate (HCO3)	mg/L	-	-	-		-
Carbonate (CO3)	mg/L	-	-	-		-
Hydroxide (OH)	mg/L	-	-	-		-
Chemical Oxygen Demand	mg/L	-	-	-		-
BOD	mg/L	-	-	-		-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-		-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-		-
Total Kjeldahl Nitrogen	mg/L	-	-	-		-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-		-
Bromide	mg/L	-	-	-		-
Chloride	mg/L	-	-	-		-
Fluoride	mg/L	-	-	-		-
Nitrate plus Nitrite (N)	mg/L	-	-	-		-
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC	-		-
Nitrate (N)	mg/L	200 (max)	10 MAC	-		-
Sulfate	mg/L	-	-	-		-
Total Organic Carbon (C)	mg/L	-	4.0	-		-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-		-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-		-
Dissolved Metals						
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾		-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾		-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾		-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾		-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾		-
Dissolved Bismuth (Bi)	mg/L	-	-	-		-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾		-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾		-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-		-
Dissolved Cesium (Cs)	mg/L	-	-	-		-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾		-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾		-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO		-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾		-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾		-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾		-
Dissolved Magnesium (Mg)	mg/L	-	700	-		-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾		-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾		-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾		-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾		-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-		-
Dissolved Potassium (K)	mg/L	373-432	-	-		-
Dissolved Rubidium (Rb)	mg/L	-	-	-		-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾		-
Dissolved Silicon (Si)	mg/L	-	-	-		-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾		-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾		-
Dissolved Strontium (Sr)	mg/L	-	-	-		-
Dissolved Sulphur (S)	mg/L	-	-	-		-
Dissolved Tellurium (Te)	mg/L	-	-	-		-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-		-
Dissolved Thorium (Th)	mg/L	-	-	-		-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾		-
Dissolved Titanium (Ti)	mg/L	2	-	-		-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾		-
Dissolved Uranium (U)	mg/L	0.3	20	0.020		-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾		-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾		-
Dissolved Zirconium (Zr)	mg/L	-	-	-		-
Total Metals						
Total Aluminum	mg/L	0.1	0.2	-		-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	-		-
Total Arsenic (As)	mg/L	0.005	0.025 MAC	-		-
Total Barium (Ba)	mg/L	5	1.0, MAC	-		-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	-		-
Total Bismuth (Bi)	mg/L	-	-	-		-



Parameters	Units	BC MoE Guidelines (a)													
		Freshwater Aquatic Life		Drinking Water	BC MOE CSR-DW	14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17	1-Aug-17	9-Aug-17	16-Aug-17		
Date					Sample	Sample	Sample	Sample	Sample	Sample	Sample	Sample			
Field															
Total Boron (B)	mg/L	1.2	5.0, MAC		0.208	0.234	0.173	0.17	0.177	0.153	0.142	0.12			
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.000186	0.000585	0.000258	0.000257	0.000296	0.000109	0.000291	0.000445			
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		201	119	175	199	283	124	273	284			
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	-			
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00097	0.0572	0.023	0.0299	0.019	0.0166	0.017	0.0228			
Total Cobalt (Co)	mg/L	0.11	-		0.0105	0.0321	0.0236	0.0259	0.0291	0.0128	0.0354	0.0355			
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00366	0.0948	0.0395	0.0417	0.0312	0.0229	0.0298	0.0385			
Total Iron (Fe)	mg/L	1	<0.3, AO		16.80	82.20	56.60	61.50	65.00	33.00	73.80	80.10			
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.00014	0.0202	0.00746	0.00801	0.00595	0.00333	0.0051	0.00572			
Total Lithium (Li)	mg/L	-	-		0.00253	0.0444	0.0175	0.0215	0.0148	0.0105	0.0113	0.0172			
Total Magnesium (Mg)	mg/L	-	700		79.1	45.7	54.2	64	76.5	36.8	83.5	82.3			
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		11.4	5.67	11.7	13.0	18.4	8.1	23.7	24.1			
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00002	0.000062	<0.000020	0.000029	0.000026	0.00007	0.000045	0.000014			
Total Molybdenum (Mo)	mg/L	2	0.25		0.00016	0.00063	0.00053	0.00085	0.00063	0.00079	0.00066	0.00092			
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.00459	0.0771	0.0351	0.0392	0.0309	0.0192	0.0304	0.0362			
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.081	1.180	0.731	0.705	0.644	0.314	0.597	0.563			
Total Potassium (K)	mg/L	373-432	-		6.84	5.5	4.17	5.63	4.55	3.61	4.84	3.68			
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	-			
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.00050	<0.00050	0.00052	0.00055	<0.00050	<0.00050	0.00061	0.00057			
Total Silicon (Si)	mg/L	-	-		11.7	72.2	36.2	62	38.2	32.8	33.8	41.3			
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		<0.000050	0.000445	0.000221	0.00023	0.000224	0.000132	0.000147	0.000333			
Total Sodium (Na)	mg/L	-	<200, AO		55.8	28.5	35.2	46	52	31.1	58.9	52.4			
Total Strontium (Sr)	mg/L	-	-		1.64	0.778	1.08	1.16	1.56	0.76	1.59	1.73			
Total Sulphur (S)	mg/L	-	-		<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0			
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050			
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.00020	0.000156	0.000075	0.000123	0.000064	0.000066	0.00003	0.000068			
Total Thorium (Th)	mg/L	-	-		<0.00010	0.00167	0.00087	0.00121	0.00065	0.0007	0.00072	0.00127			
Total Tin (Sn)	mg/L	-	-		<0.00020	0.00041	0.00028	0.00053	0.00029	0.00028	0.00024	0.00034			
Total Titanium (Ti)	mg/L	2	0.1		0.0113	0.362	0.306	0.689	0.308	0.37	0.223	0.294			
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	-			
Total Uranium (U)	mg/L	0.3	20		0.00119	0.00246	0.00139	0.00233	0.00137	0.00114	0.00116	0.00164			
Total Vanadium (V)	mg/L	0.006	0.02		0.0047	0.114	0.050	0.066	0.041	0.036	0.038	0.049			
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0065	0.161	0.0697	0.076	0.0592	0.035	0.0513	0.0624			
Total Zirconium (Zr)	mg/L	-	-		0.00059	0.00375	0.00314	0.00957	0.00335	0.00854	0.00185	0.00221			
Volatile Organic Compounds															
Benzene	µg/L	-	-		-	-	-	-	-	-	-	-			
Ethylbenzene	µg/L	-	-		-	-	-	-	-	-	-	-			
Methyl t-butyl ether (MTBE)	µg/L	-	-		-	-	-	-	-	-	-	-			
Styrene	µg/L	-	-		-	-	-	-	-	-	-	-			
Toluene	µg/L	-	-		-	-	-	-	-	-	-	-			
Xylene, m- and p-	µg/L	-	-		-	-	-	-	-	-	-	-			
Xylene, o-	µg/L	-	-		-	-	-	-	-	-	-	-			
Xylenes, total	µg/L	-	-		-	-	-	-	-	-	-	-			
BTEX+Styrene, total	µg/L	-	-		-	-	-	-	-	-	-	-			
Volatile Organic Compounds Surrogates															
bromofluorobenzene, 4-	%	-	-		-	-	-	-	-	-	-	-			
difluorobenzene, 1,4-	%	-	-		-	-	-	-	-	-	-	-			
Hydrocarbons															
EPH (C10-C19)	µg/L	-	-		-	-	-	-	-	-	-	-			
EPH (C19-C32)	µg/L	-	-		-	-	-	-	-	-	-	-			
TEH (C10-C30), BC	µg/L	-	-		-	-	-	-	-	-	-	-			
VHw (C6-C10)	µg/L	-	-		-	-	-	-	-	-	-	-			
VPHw	µg/L	-	-		-	-	-	-	-	-	-	-			
Hydrocarbons Surrogates															
bromobenzotrifluoride, 2- (EPH su	%	-	-		-	-	-	-	-	-	-	-			
dichlorotoluene, 3,4-	%	-	-		-	-	-	-	-	-	-	-			

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
 - b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
 - c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
 - d. Limit pH and temperature dependent.
 - e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
 - f. Limit for chromium (IV)
 - g. Limit for total, no dissolved concentrations
 - h. copper (mg/L) = (0.094* Hardness)/1000
 - i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	5-Oct-17	23-Apr-18	1-May-18	8-May-18	11-May-18	14-May-18	22-May-18
Date					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		0.35	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.000441	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		75.3	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.0737	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		0.0396	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.136	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		95.50	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.0227	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		0.0419	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		41.6	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		3.78	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		0.000084	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		0.00071	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0991	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		1.220	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		8.2	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.00050	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		81.3	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000464	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		46.5	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		0.551	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		<3.0	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		<0.00050	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		0.000177	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		0.00225	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		0.0003	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		0.321	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		0.00202	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		0.138	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.206	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		0.00261	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH su	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
 - b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
 - c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
 - d. Limit pH and temperature dependent.
 - e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
 - f. Limit for chromium (IV)
 - g. Limit for total, no dissolved concentrations
 - h. copper (mg/L) = (0.094* Hardness)/1000
 - i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			S						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	30-May-18	4-Jun-18	12-Jun-18	20-Jun-18	26-Jun-18	3-Jul-18	10-Jul-18
Date					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Sample
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH su	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
 - b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
 - c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
 - d. Limit pH and temperature dependent.
 - e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
 - f. Limit for chromium (IV)
 - g. Limit for total, no dissolved concentrations
 - h. copper (mg/L) = (0.094* Hardness)/1000
 - i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)			GW-2 - E309747						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	31-Jul-18	7-Aug-18	13-Aug-18	12-Sep-18	22-Oct-18	2-Nov-18	16-Apr-19
Date											
Field					Monitor	Monitor	Monitor	Sample	Monitor	Monitor	Sample
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH su	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	12-Aug-19	21-Nov-19	30-Mar-20	11-May-20	25-Jun-20	26-Aug-20	9-Sep-20
Date					Sample	Sample	Monitor	Monitor	Sample	Sample	Monitor
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	<0.50	<0.50	-
Ethylbenzene	µg/L				-	-	-	-	<0.50	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	<0.50	<0.50	-
Styrene	µg/L				-	-	-	-	<0.50	<0.50	-
Toluene	µg/L				-	-	-	-	53.1	34.6	-
Xylene, m- and p-	µg/L				-	-	-	-	<0.50	<0.50	-
Xylene, o-	µg/L				-	-	-	-	<0.50	<0.50	-
Xylenes, total	µg/L				-	-	-	-	<0.75	<0.75	-
BTEX+Styrene, total	µg/L				-	-	-	-	53.1	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	115	94.8	-
difluorobenzene, 1,4-	%				-	-	-	-	97.9	95.8	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	<250	<250	-
EPH (C19-C32)	µg/L				-	-	-	-	<250	<250	-
TEH (C10-C30), BC	µg/L				-	-	-	-	<250	-	-
VHw (C6-C10)	µg/L				-	-	-	-	<100	<100	-
VPHw	µg/L				-	-	-	-	<100	<100	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH su	%				-	-	-	-	95	115	-
dichlorotoluene, 3,4-	%				-	-	-	-	81	10	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	22-Oct-20	12-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21	26-Oct-21
Date					Sample	Monitor	Monitor	Monitor	Monitor	Monitor	Sample
Field											
Total Boron (B)	mg/L	1.2	5.0, MAC		-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		-	-	-	-	-	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		-	-	-	-	-	-	-
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		-	-	-	-	-	-	-
Total Cobalt (Co)	mg/L	0.11	-		-	-	-	-	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		-	-	-	-	-	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		-	-	-	-	-	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		-	-	-	-	-	-	-
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		-	-	-	-	-	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		-	-	-	-	-	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		-	-	-	-	-	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		-	-	-	-	-	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-
Total Potassium (K)	mg/L	373-432	-		-	-	-	-	-	-	-
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		-	-	-	-	-	-	-
Total Silicon (Si)	mg/L	-	-		-	-	-	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		-	-	-	-	-	-	-
Total Sodium (Na)	mg/L	-	<200, AO		-	-	-	-	-	-	-
Total Strontium (Sr)	mg/L	-	-		-	-	-	-	-	-	-
Total Sulphur (S)	mg/L	-	-		-	-	-	-	-	-	-
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		-	-	-	-	-	-	-
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		-	-	-	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1		-	-	-	-	-	-	-
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	-	-	-	-
Total Vanadium (V)	mg/L	0.006	0.02		-	-	-	-	-	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		-	-	-	-	-	-	-
Total Zirconium (Zr)	mg/L	-	-		-	-	-	-	-	-	-
Volatile Organic Compounds											
Benzene	µg/L				<0.50	-	-	-	-	-	<0.50
Ethylbenzene	µg/L				<0.50	-	-	-	-	-	<0.50
Methyl t-butyl ether (MTBE)	µg/L				<0.50	-	-	-	-	-	<0.50
Styrene	µg/L				<0.50	-	-	-	-	-	<0.50
Toluene	µg/L				26.2	-	-	-	-	-	1.71
Xylene, m- and p-	µg/L				<0.50	-	-	-	-	-	<0.40
Xylene, o-	µg/L				<0.50	-	-	-	-	-	<0.30
Xylenes, total	µg/L				<0.75	-	-	-	-	-	<0.50
BTEX+Styrene, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				90	-	-	-	-	-	89.6
difluorobenzene, 1,4-	%				85.9	-	-	-	-	-	111
Hydrocarbons											
EPH (C10-C19)	µg/L				<250	-	-	-	-	-	<250
EPH (C19-C32)	µg/L				<250	-	-	-	-	-	<250
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				<100	-	-	-	-	-	<100
VPHw	µg/L				<100	-	-	-	-	-	<100
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH su	%				89.5	-	-	-	-	-	108
dichlorotoluene, 3,4-	%				75.5	-	-	-	-	-	115

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			18-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	
Date					Monitor
Field					
Total Boron (B)	mg/L	1.2	5.0, MAC	-	-
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-
Total Cesium (Cs)	mg/L	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	-	-
Total Cobalt (Co)	mg/L	0.11	-	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	-	-
Total Lithium (Li)	mg/L	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	-	-
Total Molybdenum (Mo)	mg/L	2	0.25	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-
Total Potassium (K)	mg/L	373-432	-	-	-
Total Rubidium (Rb)	mg/L	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC	-	-
Total Silicon (Si)	mg/L	-	-	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	-	-
Total Sodium (Na)	mg/L	-	<200, AO	-	-
Total Strontium (Sr)	mg/L	-	-	-	-
Total Sulphur (S)	mg/L	-	-	-	-
Total Tellurium (Te)	mg/L	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002	-	-
Total Thorium (Th)	mg/L	-	-	-	-
Total Tin (Sn)	mg/L	-	-	-	-
Total Titanium (Ti)	mg/L	2	0.1	-	-
Total Tungsten (W)	mg/L	-	-	-	-
Total Uranium (U)	mg/L	0.3	20	-	-
Total Vanadium (V)	mg/L	0.006	0.02	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	-	-
Total Zirconium (Zr)	mg/L	-	-	-	-
Volatile Organic Compounds					
Benzene	µg/L				-
Ethylbenzene	µg/L				-
Methyl t-butyl ether (MTBE)	µg/L				-
Styrene	µg/L				-
Toluene	µg/L				-
Xylene, m- and p-	µg/L				-
Xylene, o-	µg/L				-
Xylenes, total	µg/L				-
BTEX+Styrene, total	µg/L				-
Volatile Organic Compounds Surrogates					
bromofluorobenzene, 4-	%				-
difluorobenzene, 1,4-	%				-
Hydrocarbons					
EPH (C10-C19)	µg/L				-
EPH (C19-C32)	µg/L				-
TEH (C10-C30), BC	µg/L				-
VHw (C6-C10)	µg/L				-
VPHw	µg/L				-
Hydrocarbons Surrogates					
bromobenzotrifluoride, 2- (EPH su	%				-
dichlorotoluene, 3,4-	%				-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
 - b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
 - c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
 - d. Limit pH and temperature dependent.
 - e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
 - f. Limit for chromium (IV)
 - g. Limit for total, no dissolved concentrations
 - h. copper (mg/L) = (0.094* Hardness)/1000
 - i. Limit for hardness based on total dissolved CaCO₃

SGW - 03

Parameters	Units	BC MoE Guidelines (a)			14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW					
Date									
Field					Sample	Sample	Sample	Sample	Sample
Conductivity	µS/cm				-	-	-	-	-
pH	pH units				-	-	-	-	-
Temperature	°C				-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-
ORP	mV				-	-	-	-	-
Water Elevation	m				-	-	-	-	-
Analyte									
Alkalinity (Total as CaCO3)	mg/L	-	-		160	340	340	290	460
Conductivity	µS/cm	-	700		352	643	613	586	830
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		159	410	443	477	531
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		7	6.6	7	7.1	6.6
Turbidity	NTU				-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-		-	-	-	-	-
Carbonate (CO3)	mg/L	-	-		-	-	-	-	-
Hydroxide (OH)	mg/L	-	-		-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-		128	465	266	509	427
BOD	mg/L	-	-		15	96	84	79	92
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<1.0	3	<1.0	3.3	<1.0
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		19.2	12	10.5	12	14.2
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.11	2.18	1.74	0.87	2.04
Bromide	mg/L				-	-	-	-	-
Chloride	mg/L				-	-	-	-	-
Fluoride	mg/L				-	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-		<0.010	0.0207	0.0468	0.046	0.0488
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC		<0.01	0.03	<0.01	<0.01	<0.01
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.01	<0.01	0.047	0.046	0.049
Sulfate	mg/L				-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		46.3	49.6	100	75	75.5
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	-
Dissolved Bismuth (Bi)	mg/L				-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L				-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L				-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	-
Dissolved Thorium (Th)	mg/L				-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-
Volatile Organic Compounds									
Benzene	µg/L				-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-
Styrene	µg/L				-	-	-	-	-
Toluene	µg/L				-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-

SGW - 03

Parameters	Units	BC MoE Guidelines (a)			13-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW					
Date									
Field									
Conductivity	µS/cm				Flooded by Weir	Flooded by Weir	Flooded by Weir	Flooded by Weir	
pH	pH units								
Temperature	°C				-	-	-	-	
Dissolved Oxygen	mg/L				-	-	-	-	
ORP	mV				-	-	-	-	
Water Elevation	m				-	-	-	-	
Analyte									
Alkalinity (Total as CaCO3)	mg/L	-	-		-	-	-	-	
Conductivity	µS/cm	-	700		-	-	-	-	
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	
Total Hardness	mg/L	-	500 (i)		-	-	-	-	
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		-	-	-	-	
Turbidity	NTU				-	-	-	-	
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-	-	-	
Bicarbonate (HCO3)	mg/L	-	-		-	-	-	-	
Carbonate (CO3)	mg/L	-	-		-	-	-	-	
Hydroxide (OH)	mg/L	-	-		-	-	-	-	
Chemical Oxygen Demand	mg/L	-	-		-	-	-	-	
BOD	mg/L	-	-		-	-	-	-	
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-	
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-	
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-	
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		-	-	-	-	
Bromide	mg/L				-	-	-	-	
Chloride	mg/L				-	-	-	-	
Fluoride	mg/L				-	-	-	-	
Nitrate plus Nitrite (N)	mg/L	-	-		-	-	-	-	
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC		-	-	-	-	
Nitrate (N)	mg/L	200 (max)	10 MAC		-	-	-	-	
Sulfate	mg/L				-	-	-	-	
Total Organic Carbon (C)	mg/L	-	4.0		-	-	-	-	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-	
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-	
Dissolved Cesium (Cs)	mg/L				-	-	-	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-	
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-	
Dissolved Rubidium (Rb)	mg/L				-	-	-	-	
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-	
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-	
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-	
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-	
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-	
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-	
Dissolved Tellurium (Te)	mg/L				-	-	-	-	
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-	
Dissolved Thorium (Th)	mg/L				-	-	-	-	
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-	
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-	
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-	
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-	
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-	
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-	
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	
Volatile Organic Compounds									
Benzene	µg/L				-	-	-	-	
Ethylbenzene	µg/L				-	-	-	-	
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	
Styrene	µg/L				-	-	-	-	
Toluene	µg/L				-	-	-	-	
Xylene, m- and p-	µg/L				-	-	-	-	

SGW - 03

Parameters	Units	BC MoE Guidelines (a)			Date
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	
Date					26-Oct-21
Field					Well Decommissioned
Conductivity	µS/cm				Flooded by Weir
pH	pH units				
Temperature	°C				-
Dissolved Oxygen	mg/L				-
ORP	mV				-
Water Elevation	m				-
Analyte					
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-
Conductivity	µS/cm	-	700	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-
Total Hardness	mg/L	-	500 (i)	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	-
Turbidity	NTU	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-
BOD	mg/L	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	-
Bromide	mg/L	-	-	-	-
Chloride	mg/L	-	-	-	-
Fluoride	mg/L	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-	-	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC	-	-
Sulfate	mg/L	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-
Dissolved Metals					
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-
Dissolved Silicon (Si)	mg/L	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-
Volatile Organic Compounds					
Benzene	µg/L	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-
Styrene	µg/L	-	-	-	-
Toluene	µg/L	-	-	-	-
Xylene, m- and p-	µg/L	-	-	-	-

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	14-Jun-17	7-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17
Date					Sample	Sample	Sample	Sample	Sample
Field									
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			SGW-3 - E309748				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	1-Aug-17	9-Aug-17	16-Aug-17	5-Oct-17	30-May-18
Date					Sample	Sample	Sample	Sample	Sample
Field									
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR, DW	10-Jul-18	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20
Date					Sample	Sample	Sample	Sample	Monitor
Field									
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR, DW	11-May-20	25-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20
Date					Monitor	Well Decommissioned	Well Decommissioned	Well Decommissioned	Well Decommissioned
Field									
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	13-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21
Date					Well Decommissioned	Well Decommissioned	Well Decommissioned	Well Decommissioned	Well Decommissioned
Field									
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			26-Oct-21
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR, DW	
Date					26-Oct-21
Field					Well Decommissioned
Xylene, o-	µg/L				-
Xylenes, total	µg/L				-
BTEX+Styrene, total	µg/L				-
Volatile Organic Compounds Surrogates					
bromofluorobenzene, 4-	%				-
difluorobenzene, 1,4-	%				-
Hydrocarbons					
EPH (C10-C19)	µg/L				-
EPH (C19-C32)	µg/L				-
TEH (C10-C30), BC	µg/L				-
VHw (C6-C10)	µg/L				-
VPHw	µg/L				-
Hydrocarbons Surrogates					
bromobenzotrifluoride, 2- (EPH surr)	%				-
dichlorotoluene, 3,4-	%				-

Notes:

0.3	A shaded value means exceeded the freshwater aquatic life criteria
0.3	A shaded value means reading exceeded the drinking water quality criteria.
0.3	A shaded value means exceeded both the aquatic life and drinking water criteria.
0.3	A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

SGW - 04

Parameters	Units	BC MoE Guidelines (a)			SGW-4 - E309749						
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	11-May-20	22-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20	13-Nov-20	16-Dec-20
					M/E	Sample	Sample	M/E	Sample	M/E	M/E
Field					M/E	Sample	Sample	M/E	Sample	M/E	M/E
Conductivity	µS/cm				293	376.1	716	445	311	702	636
pH	pH units				-	6.98	6.99	-	7.26	-	-
Temperature	°C				9.1	11.8	7.2	10.4	7.8	7.3	3.8
Dissolved Oxygen	mg/L				-	4.4	3	-	1.5	-	-
ORP	mV				-	156.5	239.9	-	227.4	-	-
Water Elevation	m				0.9	1.04	0.82	0.74	0.92	0.87	0.99
Analyte											
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-	305	403	-	251	-	-
Conductivity	µS/cm	-	700	-	-	515	701	-	475	-	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	319	371	-	318	-	-
Total Hardness	mg/L	-	500 (i)	-	-	-	-	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	-	7.55	7.74	-	8.02	-	-
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	76	30	-	76	-	-
BOD	mg/L	-	-	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	-	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.404	0.412	-	0.758	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	-	0.0539	0.0594	-	0.0352	-	-
Bromide	mg/L	-	-	-	-	<0.050	<0.250	-	<0.050	-	-
Chloride	mg/L	-	-	-	-	2.36	3.49	-	1.07	-	-
Fluoride	mg/L	-	-	-	-	0.067	<0.100	-	0.062	-	-
Nitrate plus Nitrite (N)	mg/L	-	-	-	-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06 - 0.6 (max) (c)	1.0 MAC	-	-	<0.0050	<0.0050	-	<0.0010	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC	-	-	<0.0010	<0.0250	-	0.0062	-	-
Sulfate	mg/L	-	-	-	-	2.48	2.67	-	1.03	-	-
Total Organic Carbon (C)	mg/L	-	4.0	-	-	11.7	11.6	-	20.6	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0041	0.0065	-	0.0169	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	<0.00010	<0.00010	-	0.00010	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00086	0.00098	-	0.00163	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.074	0.0917	-	0.0777	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.000100	<0.000100	-	<0.000100	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	<0.000050	-	<0.000050	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.012	0.017	-	0.016	-	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	0.0000233	0.0000353	-	0.0000287	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	72.7	87.4	-	73.5	-	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-	<0.000010	<0.000010	-	<0.000010	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	<0.00010	<0.00010	-	<0.00010	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	0.0061	0.00503	-	0.00570	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00304	0.00092	-	0.00290	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	3.88	2.74	-	0.136	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	0.000079	<0.000050	-	0.000054	-	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	0.0015	0.0020	-	0.0017	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	33.3	37.1	-	32.5	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	1.35	1.48	-	1.40	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.0000050	<0.0000050	-	<0.0000050	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.00202	0.00240	-	0.00310	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	0.00273	0.00298	-	0.00388	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	<0.050	-	<0.050	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	1.97	2.16	-	2.24	-	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	0.00028	0.00032	-	0.00030	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	0.000112	0.000057	-	0.000081	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	3.88	4.98	-	4.72	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	<0.000010	<0.000010	-	<0.000010	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	6.74	7.40	-	6.97	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	0.736	0.844	-	0.792	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	0.62	0.79	-	0.56	-	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-	<0.00020	<0.00020	-	<0.00020	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	<0.000010	<0.000010	-	<0.000010	-	-
Dissolved Thorium (Th)	mg/L	-	-	-	-	<0.00010	<0.00010	-	<0.00010	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	<0.00010	0.00021	-	<0.00010	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.00030	<0.00030	-	0.00044	-	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	<0.00010	<0.00010	-	<0.00010	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.000498	0.000650	-	0.000542	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	<0.00050	<0.00050	-	<0.00050	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	0.0024	0.0013	-	0.0039	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.00020	<0.00020	-	<0.00020	-	-
Volatile Organic Compounds											
Benzene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-
Ethylbenzene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-
Styrene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-
Toluene	µg/L	-	-	-	-	<0.50	<0.50	-	4.65	-	-
Xylene, m- and p-	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-
Xylene, o-	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50	-	-

SGW - 04

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	20-Jan-21	22-Apr-21	16-Jul-21	26-Oct-21	18-Jan-22
Date					M/E	M/E	M/E	Sample	Monitor
Field									
Conductivity	µS/cm				501	559	805	444	Frozen
pH	pH units				-	-	-	7.25	-
Temperature	°C				2.7	4.7	8.6	8.1	-
Dissolved Oxygen	mg/L				-	-	-	1.7	-
ORP	mV				-	-	-	242.2	-
Water Elevation	m				0.84	0.98	1.79	1.05	-
Analyte									
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-	-	-	546	-
Conductivity	uS/cm	-	700	-	-	-	-	951	-
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	-	-	464	-
Total Hardness	mg/L	-	500 (i)	-	-	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	-	-	-	7.34	-
Turbidity	NTU	-	-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	27	-
BOD	mg/L	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	-	-	0.76	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	-	-	-	0.0426	-
Bromide	mg/L	-	-	-	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-	-	7.44	-
Fluoride	mg/L	-	-	-	-	-	-	<0.10	-
Nitrate plus Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06 - 0.6 (max) (c)	1.0 MAC	-	-	-	-	<0.0050	-
Nitrate (N)	mg/L	200 (max)	10 MAC	-	-	-	-	<0.0250	-
Sulfate	mg/L	-	-	-	-	-	-	5.26	-
Total Organic Carbon (C)	mg/L	-	4.0	-	-	-	-	14.9	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	0.0322	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	0.00015	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	0.00180	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	0.134	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	0.017	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	0.0000920	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	113	-
Dissolved Cesium (Cs)	mg/L	-	-	-	-	-	-	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	<0.00050	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	0.00344	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	0.00475	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	0.302	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	0.000061	-
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	-	-	0.0020	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	44.3	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	2.31	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	<0.000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	0.00204	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	0.00401	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	2.30	-
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	-	-	0.00031	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	0.000076	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	6.02	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	9.30	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	1.09	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	2.50	-
Dissolved Tellurium (Te)	mg/L	-	-	-	-	-	-	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	<0.000010	-
Dissolved Thorium (Th)	mg/L	-	-	-	-	-	-	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	<0.00010	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	0.00105	-
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	-	-	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	0.00109	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	0.0024	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	<0.00020	-
Volatile Organic Compounds									
Benzene	µg/L	-	-	-	-	-	-	<0.50	-
Ethylbenzene	µg/L	-	-	-	-	-	-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	-	-	<0.50	-
Styrene	µg/L	-	-	-	-	-	-	<0.50	-
Toluene	µg/L	-	-	-	-	-	-	<0.50	-
Xylene, m- and p-	µg/L	-	-	-	-	-	-	<0.40	-
Xylene, o-	µg/L	-	-	-	-	-	-	<0.30	-

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	10-Jul-18	11-Sep-18	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20
Date					Sample	Sample	Sample	Sample	Sample	Sample
Field										
Xylenes, total	µg/L				-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-
Hydrocarbons										
EPH (C10-C19)	µg/L				-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	SGW-4 - E309749						
Date					11-May-20	22-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20	13-Nov-20	16-Dec-20
Field					M/E	Sample	Sample	M/E	Sample	M/E	M/E
Xylenes, total	µg/L				-	<0.75	<0.75	-	<0.75	-	-
BTEX+Styrene, total	µg/L				-	<1.5	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	107	93.7	-	90.7	-	-
difluorobenzene, 1,4-	%				-	97.7	106	-	87.7	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	<250	<250	-	<250	-	-
EPH (C19-C32)	µg/L				-	<250	<250	-	<250	-	-
TEH (C10-C30), BC	µg/L				-	<250	-	-	-	-	-
VHW (C6-C10)	µg/L				-	<100	<100	-	<100	-	-
VPHw	µg/L				-	<100	<100	-	<100	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPH surr)	%				-	87.5	91.8	-	88.5	-	-
dichlorotoluene, 3,4-	%				-	86.9	92.4	-	109	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094 * Hardness) / 1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR-DW	20-Jan-21	22-Apr-21	16-Jul-21	26-Oct-21	18-Jan-22	
Date										
Field					M/E	M/E	M/E	Sample	Monitor	
Xylenes, total	µg/L				-	-	-	<0.50	-	
BTEX+Styrene, total	µg/L				-	-	-	-	-	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				-	-	-	91.4	-	
difluorobenzene, 1,4-	%				-	-	-	110	-	
Hydrocarbons										
EPH (C10-C19)	µg/L				-	-	-	<250	-	
EPH (C19-C32)	µg/L				-	-	-	<250	-	
TEH (C10-C30), BC	µg/L				-	-	-	-	-	
VHw (C6-C10)	µg/L				-	-	-	<100	-	
VPHw	µg/L				-	-	-	<100	-	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	87.2	-	
dichlorotoluene, 3,4-	%				-	-	-	106	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094 * Hardness) / 1000
- i. Limit for hardness based on total dissolved CaCO³

SGW - 05

Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	10-Jul-18	11-Sep-18	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20
Date					Sample	Sample	Sample	Sample	Sample	Frozen
Field										
Conductivity	µS/cm				-	-	-	-	-	-
pH	pH units				-	-	-	-	-	-
Temperature	°C				-	-	-	-	-	-
Dissolved Oxygen	mg/L				-	-	-	-	-	-
ORP	mV				-	-	-	-	-	-
Water Elevation	m				-	-	-	-	-	-
Analyte										
Alkalinity (Total as CaCO ₃)	mg/L	-	-		454	547	-	-	-	-
Conductivity	µS/cm	-	700		-	-	-	-	-	-
Dissolved Hardness (CaCO ₃)	mg/L	-	500		-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		494	656	454	506	426	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		-	-	-	-	-	-
Turbidity	NTU				-	-	-	-	-	-
Alkalinity (PP as CaCO ₃)	mg/L	-	-		-	-	-	-	-	-
Bicarbonate (HCO ₃)	mg/L	-	-		-	-	-	-	-	-
Carbonate (CO ₃)	mg/L	-	-		-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-		-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-		55	24	85	72	35	-
BOD	mg/L	-	-		-	-	-	-	-	-
Dissolved Sulphate (SO ₄)	mg/L	100 (max)	<500, AO		23.4	13.9	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		12.7	12.7	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0298	0.0689	-	-	-	-
Bromide	mg/L				-	-	-	-	-	-
Chloride	mg/L				-	-	-	-	-	-
Fluoride	mg/L				-	-	-	-	-	-
Nitrate plus Nitrite (N)	mg/L	-	-		<0.03	<0.03	-	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC		<0.0050	<0.0050	<0.025	<0.025	0.049	-
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.025	<0.025	<0.0050	<0.0050	<0.0050	-
Sulfate	mg/L				-	-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		10.6	9.04	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-	-	-	-	-
Dissolved Metals										
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0571	0.278	0.0051	0.004	0.0081	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00011	0.00012	<0.00010	<0.00010	<0.00010	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00351	0.00994	0.001	0.002	0.00053	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0997	0.169	0.103	0.132	0.104	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Dissolved Bismuth (Bi)	mg/L	-	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	0.017	0.024	0.017	0.02	0.015	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.0000304	0.0000538	0.0000313	0.0000172	0.0000781	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		110	148	100	109	102	-
Dissolved Cesium (Cs)	mg/L				0.000011	0.000039	<0.000010	<0.000010	<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00010	0.00023	<0.00010	<0.00010	<0.00010	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00842	0.00934	0.00772	0.00596	0.00107	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.0072	0.00212	0.00115	0.00053	0.0021	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.159	2.81	1.76	0.239	0.03	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000399	0.000705	<0.000050	<0.000050	<0.000050	-
Dissolved Lithium (Li)	mg/L				0.008 ⁽²⁾	0.0022	0.0029	0.002	0.0024	0.0021
Dissolved Magnesium (Mg)	mg/L	-	700		-	53.5	69.7	49.4	57.1	41.7
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	1.7	3.02	1.3	1.76	0.798	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.0000162	0.0000133	<0.0000050	<0.0000050	<0.0000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00447	0.00411	0.00144	0.0024	0.00145	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00377	0.00452	0.00334	0.00317	0.00259	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	<0.050	<0.050	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-		2.69	3.22	2.3	2.95	2.41	-
Dissolved Rubidium (Rb)	mg/L				0.0004	0.00048	0.00034	0.00044	0.00028	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000053	0.000069	0.000055	<0.000050	0.000071	-
Dissolved Silicon (Si)	mg/L	-	-		5.36	6.93	4.63	6.39	5.77	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	0.000019	<0.000010	<0.000010	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	13.7	16.5	10.9	12.3	8.24	-
Dissolved Strontium (Sr)	mg/L	-	-		1.12	1.55	1.07	1.19	1.01	-
Dissolved Sulphur (S)	mg/L	-	-		6.96	3.34	3.41	1.76	2.95	-
Dissolved Tellurium (Te)	mg/L				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2		<0.000010	<0.000010	<0.000010	0.00001	0.000011	-
Dissolved Thorium (Th)	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Dissolved Titanium (Ti)	mg/L	2	-		0.00142	<0.0060	<0.00030	<0.00030	0.0006	-
Dissolved Tungsten (W)	mg/L				0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000984	0.0012	0.00039	0.000867	0.000761	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	0.00092	<0.00050	<0.00050	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0063	0.0027	0.0022	<0.0010	0.0011	-
Dissolved Zirconium (Zr)	mg/L	-	-		<0.000060	0.000221	<0.000060	<0.00020	<0.00020	-
Volatile Organic Compounds										
Benzene	µg/L				-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-

SGW - 05

Parameters	Units	BC MoE Guidelines (a)			SGW-5 - E309750				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	11-May-20	25-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20
Date					Monitor	Sample	Sample	Monitor	Sample
Field									
Conductivity	µS/cm				117	273.7	410	354	327.3
pH	pH units				-	7.09	6.99	-	7.19
Temperature	°C				9.4	5.5	7.7	10.4	6.9
Dissolved Oxygen	mg/L				-	2.1	2.2	-	2.1
ORP	mV				-	67.2	235.5	-	225
Water Elevation	m				0.57	1.1	0.97	1.04	1.1
Analyte									
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-	305	403	-	278
Conductivity	µS/cm	-	700	-	-	515	701	-	511
Dissolved Hardness (CaCO3)	mg/L	-	500	-	-	319	371	-	290
Total Hardness	mg/L	-	500 (i)	-	-	-	-	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	-	7.55	7.74	-	7.94
Turbidity	NTU	-	-	-	-	-	-	-	-
Alkalinity (PP as CaCO3)	mg/L	-	-	-	-	-	-	-	-
Bicarbonate (HCO3)	mg/L	-	-	-	-	-	-	-	-
Carbonate (CO3)	mg/L	-	-	-	-	-	-	-	-
Hydroxide (OH)	mg/L	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	76	30	-	40
BOD	mg/L	-	-	-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.404	0.412	-	0.431
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	-	0.0539	0.0594	-	0.0946
Bromide	mg/L	-	-	-	-	<0.050	<0.250	-	<0.050
Chloride	mg/L	-	-	-	-	2.36	3.49	-	3.49
Fluoride	mg/L	-	-	-	-	0.067	<0.100	-	0.067
Nitrate plus Nitrite (N)	mg/L	-	-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC	-	-	<0.0050	<0.0050	-	0.0012
Nitrate (N)	mg/L	200 (max)	10 MAC	-	-	<0.0010	<0.0250	-	<0.0050
Sulfate	mg/L	-	-	-	-	2.48	2.67	-	3.33
Total Organic Carbon (C)	mg/L	-	4.0	-	-	11.7	11.6	-	9.69
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-	-	-	-	-	-	-
Dissolved Metals									
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.0041	0.0065	-	0.0299
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	<0.00010	<0.00010	-	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00086	0.00098	-	0.00120
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.074	0.0917	-	0.0726
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.000100	<0.000100	-	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	<0.000050	-	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	0.012	0.017	-	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	0.0000233	0.0000353	-	0.0000074
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	72.7	87.4	-	79.5
Dissolved Cesium (Cs)	mg/L	-	-	-	-	<0.000010	<0.000010	-	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	<0.00010	<0.00010	-	<0.00010
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	0.0061	0.00503	-	0.00283
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00304	0.00092	-	0.00255
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	3.88	2.74	-	0.220
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	0.000079	<0.000050	-	0.000067
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	0.0015	0.0020	-	0.0015
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	33.3	37.1	-	22.2
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	1.35	1.48	-	0.952
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	<0.0000050	<0.0000050	-	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.00202	0.00240	-	0.00171
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	0.00273	0.00298	-	0.00200
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	<0.050	-	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	-	1.97	2.16	-	1.58
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	0.00028	0.00032	-	0.00031
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	0.000112	0.000057	-	<0.000050
Dissolved Silicon (Si)	mg/L	-	-	-	-	3.88	4.98	-	5.45
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	<0.000010	<0.000010	-	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	6.74	7.40	-	9.92
Dissolved Strontium (Sr)	mg/L	-	-	-	-	0.736	0.844	-	0.650
Dissolved Sulphur (S)	mg/L	-	-	-	-	0.62	0.79	-	1.14
Dissolved Tellurium (Te)	mg/L	-	-	-	-	<0.00020	<0.00020	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	<0.000010	<0.000010	-	<0.000010
Dissolved Thorium (Th)	mg/L	-	-	-	-	<0.00010	<0.00010	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	<0.00010	0.00021	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	-	<0.00030	<0.00030	-	0.00038
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	<0.00010	<0.00010	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.000498	0.000650	-	0.000415
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	<0.00050	<0.00050	-	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	0.0024	0.0013	-	0.0021
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	<0.00020	<0.00020	-	<0.00020
Volatile Organic Compounds									
Benzene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50
Ethylbenzene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50
Methyl t-butyl ether (MTBE)	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50
Styrene	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50
Toluene	µg/L	-	-	-	-	<0.50	<0.50	-	2.08
Xylene, m- and p-	µg/L	-	-	-	-	<0.50	<0.50	-	<0.50

SGW - 05

Parameters	Units	BC MoE Guidelines (a)			26-Oct-21	19-Jan-22
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW		
Date					Sample	Monitor
Field					352	Frozen
Conductivity	µS/cm				7.39	-
pH	pH units				7.9	-
Temperature	°C				1.7	-
Dissolved Oxygen	mg/L				7.1	-
ORP	mV				1.1	-
Water Elevation	m					
Analyte						
Alkalinity (Total as CaCO3)	mg/L	-	-		314	-
Conductivity	µS/cm	-	700		560	-
Dissolved Hardness (CaCO3)	mg/L	-	500		276	-
Total Hardness	mg/L	-	500 (i)		-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		7.94	-
Turbidity	NTU				-	-
Alkalinity (PP as CaCO3)	mg/L	-	-		-	-
Bicarbonate (HCO3)	mg/L	-	-		-	-
Carbonate (CO3)	mg/L	-	-		-	-
Hydroxide (OH)	mg/L	-	-		-	-
Chemical Oxygen Demand	mg/L	-	-		27	-
BOD	mg/L	-	-		-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-
Total Kjeldahl Nitrogen	mg/L	-	-		0.609	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.119	-
Bromide	mg/L				-	-
Chloride	mg/L				2.59	-
Fluoride	mg/L				0.058	-
Nitrate plus Nitrite (N)	mg/L	-	-		-	-
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC		0.002	-
Nitrate (N)	mg/L	200 (max)	10 MAC		0.0096	-
Sulfate	mg/L				4.8	-
Total Organic Carbon (C)	mg/L	-	4.0		10.2	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-
TSS	mg/L	25 mg/L (background 25-250 mg/l) (i)	-		-	-
Dissolved Metals						
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0128	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00010	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00157	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0776	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.0000152	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	80.4	-
Dissolved Cesium (Cs)	mg/L				<0.000010	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00050	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00202	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00053	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	2.65	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	0.0014	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	18.2	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	1.63	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.00176	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00254	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	-
Dissolved Potassium (K)	mg/L	373-432	-	-	1.69	-
Dissolved Rubidium (Rb)	mg/L				0.00038	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.000050	-
Dissolved Silicon (Si)	mg/L	-	-	-	5.49	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	6.51	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.596	-
Dissolved Sulphur (S)	mg/L	-	-	-	1.52	-
Dissolved Tellurium (Te)	mg/L				<0.00020	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	-
Dissolved Thorium (Th)	mg/L				<0.00010	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	-
Dissolved Titanium (Ti)	mg/L	2	-	-	<0.00030	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000405	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	<0.0010	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00020	-
Volatile Organic Compounds						
Benzene	µg/L				<0.50	-
Ethylbenzene	µg/L				<0.50	-
Methyl t-butyl ether (MTBE)	µg/L				<0.50	-
Styrene	µg/L				<0.50	-
Toluene	µg/L				<0.50	-
Xylene, m- and p-	µg/L				<0.40	-



Parameters	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	10-Jul-18	11-Sep-18	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20
Date					10-Jul-18	11-Sep-18	16-Apr-19	12-Aug-19	21-Nov-19	30-Mar-20
Field					Sample	Sample	Sample	Sample	Sample	Frozen
Xylene, o-	µg/L				-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-	-
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-
Hydrocarbons										
EPH (C10-C19)	µg/L				-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094 * Hardness) / 1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)			SGW-5 - E309750				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	11-May-20	25-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20
Date					11-May-20	25-Jun-20	26-Aug-20	9-Sep-20	22-Oct-20
Field					Monitor	Sample	Sample	Monitor	Sample
Xylene, o-	µg/L				-	<0.50	<0.50	-	<0.50
Xylenes, total	µg/L				-	<0.75	<0.75	-	<0.75
BTEX+Styrene, total	µg/L				-	<1.5	-	-	-
Volatle Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	107	93.7	-	91.8
difluorobenzene, 1,4-	%				-	97.7	106	-	87.8
Hydrocarbons									
EPH (C10-C19)	µg/L				-	<250	<250	-	<250
EPH (C19-C32)	µg/L				-	<250	<250	-	<250
TEH (C10-C30), BC	µg/L				-	<250	-	-	-
VHw (C6-C10)	µg/L				-	<100	<100	-	<100
VPHw	µg/L				-	<100	<100	-	<100
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	87.5	91.8	-	85.3
dichlorotoluene, 3,4-	%				-	86.9	92.4	-	102

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Parameters	Units	BC MoE Guidelines (a)							
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	12-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21
Date					12-Nov-20	16-Dec-20	20-Jan-21	21-Apr-21	16-Jul-21
Field					Monitor	Monitor	Monitor	Monitor	Monitor
Xylene, o-	µg/L				-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-
BTEX+Styrene, total	µg/L				-	-	-	-	-
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	%				-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-
Hydrocarbons									
EPH (C10-C19)	µg/L				-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-
VPHw	µg/L				-	-	-	-	-
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
 - 0.3 A shaded value means reading exceeded the drinking water quality criteria.
 - 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
 - 0.3 A shaded value means reading had detection limit exceeding criteria.
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094 * Hardness) / 1000
- i. Limit for hardness based on total dissolved CaCO₃

Parameters	Units	BC MoE Guidelines (a)				
		Freshwater Aquatic Life	Drinking Water	BC MOE CSR DW	26-Oct-21	19-Jan-22
Date					Sample	Monitor
Field						
Xylene, o-	µg/L				<0.30	-
Xylenes, total	µg/L				<0.50	-
BTEX+Styrene, total	µg/L				-	-
Volatile Organic Compounds Surrogates						
bromofluorobenzene, 4-	%				89.8	-
difluorobenzene, 1,4-	%				110	-
Hydrocarbons						
EPH (C10-C19)	µg/L				<250	-
EPH (C19-C32)	µg/L				<250	-
TEH (C10-C30), BC	µg/L				-	-
VHw (C6-C10)	µg/L				<100	-
VPHw	µg/L				<100	-
Hydrocarbons Surrogates						
bromobenzotrifluoride, 2- (EPH surr)	%				97.3	-
dichlorotoluene, 3,4-	%				113	-

Notes:

- | | |
|-----|--|
| 0.3 | A shaded value means exceeded the freshwater aquatic life criteria |
| 0.3 | A shaded value means reading exceeded the drinking water quality criteria. |
| 0.3 | A shaded value means exceeded both the aquatic life and drinking water criteria. |
| 0.3 | A shaded value means reading had detection limit exceeding criteria. |
- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			16-Apr-16	7-Jul-16	25-Oct-16
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Dissolved Oxygen	mg/L				-	-	-
Conductivity	µS/cm				-	-	-
pH	pH units				-	-	-
Temperature	°C				-	-	-
Turbidity	NTU				-	-	-
Flow Rate	m/sec				-	-	-
Lab Analyte							
Alkalinity (Total as CaCO3)	mg/L	-	-		17	10	23
Conductivity	uS/cm	-	700		34	44	51
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-
Total Hardness	mg/L	-	500 (i)		18	41	23
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.2	5.2	6.5
Chemical Oxygen Demand	mg/L	-	-		42	145	50
BOD	mg/L	-	-		<5.0	28	6.6
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<1.0	8.8	<1.0
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		<1.0	<1.0	2
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		<0.03	0.11	<0.03
Chloride	mg/L				-	-	-
Fluoride	mg/L				-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		0.014	0.01	<0.01
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.01	<0.01	<0.01
Sulfate	mg/L				-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		12.3	41.8	17.6
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			SW-1 -			
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19
Dissolved Oxygen	mg/L				-	-	6.3	-
Conductivity	µS/cm				-	-	17.3	-
pH	pH units				-	-	6	-
Temperature	°C				-	-	5.4	-
Turbidity	NTU				-	-	7.98	-
Flow Rate	m/sec				-	-	-	-
Lab Analyte								
Alkalinity (Total as CaCO3)	mg/L	-	-		20		-	-
Conductivity	uS/cm	-	700		44		-	-
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	11.4	-
Total Hardness	mg/L	-	500 (i)		22	16	-	-
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.1		-	-
Chemical Oxygen Demand	mg/L	-	-		92	45	37	-
BOD	mg/L	-	-		4.4	<2.0	3.8	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<1.0	<0.30	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		<1.0	<0.50	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		-	-	-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		<0.03	0.0121	0.007	-
Chloride	mg/L				-	-	<0.50	-
Fluoride	mg/L				-	-	0.028	-
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.01	0.0061	0.0086	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.01	<0.0010	<0.0010	-
Sulfate	mg/L				-	-	<0.30	-
Total Organic Carbon (C)	mg/L	-	4.0		1.0	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			E309751			
		Freshwater Aquatic Life	Drinking Water	CSR DW	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20
Dissolved Oxygen	mg/L				5.3	2.8	3.2	3.2
Conductivity	µS/cm				22.8	34.3	40	38.5
pH	pH units				7.49	6.31	5.69	5.84
Temperature	°C				1.4	14.1	14.1	9.5
Turbidity	NTU				17.1	-	4.92	5
Flow Rate	m/sec				-	0	0	0
Lab Analyte								
Alkalinity (Total as CaCO3)	mg/L	-	-		14.7	16	23.6	22.8
Conductivity	uS/cm	-	700		38.4	37	50.1	53.2
Dissolved Hardness (CaCO3)	mg/L	-	500		17	18.5	24.0	25.8
Total Hardness	mg/L	-	500 (i)		-	19.4	24.2	26
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		7.01	6.57	6.61	7.08
Chemical Oxygen Demand	mg/L	-	-		47	64	45	61
BOD	mg/L	-	-		-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		1.34	1.04	0.546	0.369
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0426	0.015	0.0086	0.0209
Chloride	mg/L				1.15	<0.50	<0.50	0.64
Fluoride	mg/L				0.027	0.024	0.034	0.035
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0050	0.0057	<0.0050	0.0051
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.0010	<0.0010	<0.0010	<0.0010
Sulfate	mg/L				<0.30	<0.30	<0.30	<0.30
Total Organic Carbon (C)	mg/L	-	4.0		17.8	18	16.1	21.5
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			21-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Dissolved Oxygen	mg/L				2.80	DRY	1.60
Conductivity	µS/cm				30.70	-	70.80
pH	pH units				6.22	-	6.10
Temperature	°C				8.40	-	5.30
Turbidity	NTU				2.91	-	2.89
Flow Rate	m/sec				0.00	-	0.00
Lab Analyte							
Alkalinity (Total as CaCO3)	mg/L	-	-		22.20	-	28.70
Conductivity	uS/cm	-	700		43.90	-	65.70
Dissolved Hardness (CaCO3)	mg/L	-	500		19.60	-	30.80
Total Hardness	mg/L	-	500 (i)		19.00	-	30.80
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.71	-	6.42
Chemical Oxygen Demand	mg/L	-	-		28.00	-	66.00
BOD	mg/L	-	-		-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		0.387	-	0.739
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0062	-	<0.0050
Chloride	mg/L				<0.50	-	1.23
Fluoride	mg/L				0.029	-	0.031
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0050	-	<0.0050
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.0010	-	<0.0010
Sulfate	mg/L				<0.30	-	<0.30
Total Organic Carbon (C)	mg/L	-	4.0		11.1	-	18.600
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-

Field	Units	BC MoE Guidelines (a)			16-Apr-16	7-Jul-16	25-Oct-16
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Dissolved Metals							
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L			-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-
Dissolved Mercury (Hg)	mg/L.	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L			-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L			-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-
Dissolved Thorium (Th)	mg/L			-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-

Field	Units	BC MoE Guidelines (a)			SW-1 -			
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19
Dissolved Metals								
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	-	-
Dissolved Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	-	-
Dissolved Cesium (Cs)	mg/L			-	-	-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	-	-
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	-	-
Dissolved Rubidium (Rb)	mg/L			-	-	-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	-	-
Dissolved Tellurium (Te)	mg/L			-	-	-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	-	-
Dissolved Thorium (Th)	mg/L			-	-	-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	-	-
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	-	-	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	-	-

Field	Units	BC MoE Guidelines (a)			E309751			
		Freshwater Aquatic Life	Drinking Water	CSR DW	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20
Dissolved Metals								
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.76	0.103	0.175	0.335
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	0.00018	<0.00010	0.00010	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00064	0.00035	0.00074	0.00059
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0133	0.0122	0.0121	0.0142
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.00010	<0.000100	<0.000100	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	<0.010	<0.010	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.0000461	0.0000244	0.0000382	0.0000151
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	4.95	5.19	7.03	7.44
Dissolved Cesium (Cs)	mg/L				0.00003	<0.000010	<0.000010	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.00089	0.00034	0.00042	0.00052
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00034	0.00014	0.00030	0.00030
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.006	0.00078	0.00192	0.00272
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.519	0.186	0.374	0.434
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000179	<0.000050	<0.000050	0.000073
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Magnesium (Mg)	mg/L	-	700	-	1.14	1.36	1.56	1.74
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0564	0.0188	0.0520	0.0419
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.0000093	<0.0000050	<0.0000050	0.0000132
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000089	<0.000050	0.000079	0.000054
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00088	0.00076	0.00110	0.00123
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	<0.050	<0.050	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	1.36	0.393	1.07	1.34
Dissolved Rubidium (Rb)	mg/L				0.00094	0.00059	0.00106	0.00106
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000104	<0.000050	0.000097	0.000085
Dissolved Silicon (Si)	mg/L	-	-	-	5.11	2.27	4.46	4.22
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	0.000016	<0.000010	<0.000010	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	1.32	1.20	1.67	1.72
Dissolved Strontium (Sr)	mg/L	-	-	-	0.0338	0.0382	0.0498	0.0532
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50
Dissolved Tellurium (Te)	mg/L				<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	<0.000010	<0.000010
Dissolved Thorium (Th)	mg/L				<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	0.017	0.00066	0.00249	0.00426
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000029	<0.000010	<0.000010	0.000018
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00135	<0.00050	<0.00050	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0063	0.0086	0.0051	0.0047
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00108	0.00025	0.00045	0.00050

Field	Units	BC MoE Guidelines (a)			21-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Dissolved Metals							
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.160	-	0.20
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00010	-	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00040	-	0.00094
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.00897	-	0.0134
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	-	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	-	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	-	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.0000153	-	0.0000231
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	5.38	-	8.58
Dissolved Cesium (Cs)	mg/L				<0.000010	-	0.000014
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	<0.00050	-	<0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00018	-	0.00070
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00275	-	0.00137
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.297	-	0.868
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	-	0.000051
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.0010	-	<0.0010
Dissolved Magnesium (Mg)	mg/L	-	700	-	1.50	-	2.28
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0271	-	0.171
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	-	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000080	-	0.000073
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00059	-	0.00103
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	-	0.130
Dissolved Potassium (K)	mg/L	373-432	-	-	0.867	-	2.22
Dissolved Rubidium (Rb)	mg/L				0.00059	-	0.00268
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.000050	-	0.000085
Dissolved Silicon (Si)	mg/L	-	-	-	2.90	-	4.27
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	-	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	1.32	-	1.73
Dissolved Strontium (Sr)	mg/L	-	-	-	0.0356	-	0.0572
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	-	<0.50
Dissolved Tellurium (Te)	mg/L				<0.00020	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	-	<0.000010
Dissolved Thorium (Th)	mg/L				<0.00010	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	0.00222	-	0.00280
Dissolved Tungsten (W)	mg/L			0.003 ⁽²⁾	<0.00010	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	<0.000010	-	<0.000010
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	-	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0048	-	0.0066
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00036	-	0.00049

Field	Units	BC MoE Guidelines (a)			16-Apr-16	7-Jul-16	25-Oct-16
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Total Metals							
Total Aluminum	mg/L	0.1	0.2	0.325	11.1	0.275	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	0.0001	0.0005	0.0003	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	0.0008	0.0064	0.0024	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.014	0.173	0.020	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.0001	0.0003	<0.0001	
Total Bismuth (Bi)	mg/L	-	-	<0.0001	<0.0001	<0.0001	
Total Boron (B)	mg/L	1.2	5.0, MAC	0.005	0.045	<0.004	
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.00007	0.00325	0.00017	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	5.6	11.9	7.1	
Total Cesium (Cs)	mg/L	-	-	-	-	-	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.0007	0.0105	0.0009	
Total Cobalt (Co)	mg/L	0.11	-	0.00082	0.0125	0.00272	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	0.0028	0.0318	0.0017	
Total Iron (Fe)	mg/L	1	<0.3, AO	1.10	24.80	3.47	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	0.0002	0.0061	<0.0001	
Total Lithium (Li)	mg/L	-	-	0.0002	0.0046	0.0001	
Total Magnesium (Mg)	mg/L	-	700	1.06	2.81	1.36	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.183	1.63	0.554	
Total Mercury (Hg)	mg/L.	0.0001, MAC	0.001, MAC	<0.00002	<0.00002	<0.00002	
Total Molybdenum (Mo)	mg/L	2	0.25	0.0002	0.0019	0.0002	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.0011	0.0164	0.0016	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	0.09	1.69	0.1	
Total Potassium (K)	mg/L	373-432	-	0.79	1.71	1.14	
Total Rubidium (Rb)	mg/L	-	-	-	-	-	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	<0.0005	<0.0005	<0.0005	
Total Silicon (Si)	mg/L	-	-	3.7	15.3	4.8	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	<0.00005	0.00026	<0.00005	
Total Sodium (Na)	mg/L	-	<200, AO	1.45	1.1	1.47	
Total Strontium (Sr)	mg/L	-	-	0.038	0.082	0.06	
Total Sulphur (S)	mg/L	-	-	<1	3	<1	
Total Tellurium (Te)	mg/L	-	-	<0.0002	<0.0002	<0.0002	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.00002	0.00005	<0.00002	
Total Thorium (Th)	mg/L	-	-	<0.0001	0.00	<0.0001	
Total Tin (Sn)	mg/L	-	-	<0.0002	<0.0002	<0.0002	
Total Titanium (Ti)	mg/L	2	0.1	0.007	0.121	<0.005	
Total Tungsten (W)	mg/L	-	-	-	-	-	
Total Uranium (U)	mg/L	0.3	20	<0.00002	0.00027	<0.00002	
Total Vanadium (V)	mg/L	0.006	0.02	<0.001	0.024	0.001	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	0.008	0.056	0.008	
Total Zirconium (Zr)	mg/L	-	-	0.0003	0.0009	0.0002	

Field	Units	BC MoE Guidelines (a)			SW-1 -			
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19
Total Metals								
Total Aluminum	mg/L	0.1	0.2		0.155	0.115	0.837	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		<0.00010	<0.00010	0.00018	-
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.00078	0.00053	0.00054	-
Total Barium (Ba)	mg/L	5	1.0, MAC		0.014	0.012	0.0139	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.00010	<0.00010	<0.00010	-
Total Bismuth (Bi)	mg/L	-	-		<0.00010	<0.000050	<0.000050	-
Total Boron (B)	mg/L	1.2	5.0, MAC		0.005	<0.010	<0.010	-
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.000047	0.0000481	0.0000443	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		6.7	4.76	3.27	-
Total Cesium (Cs)	mg/L	-	-		-	<0.000010	0.000056	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00067	0.0004	0.00089	-
Total Cobalt (Co)	mg/L	0.11	-		0.00111	0.00072	0.00045	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00161	0.00122	0.00352	-
Total Iron (Fe)	mg/L	1	<0.3, AO		1.30	0.66	0.794	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		<0.00010	0.000059	0.000202	-
Total Lithium (Li)	mg/L	-	-		0.00011	<0.0010	<0.0010	-
Total Magnesium (Mg)	mg/L	-	700		1.19	1.06	0.791	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.165	0.126	0.0574	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00002	<0.0000050	0.0000091	-
Total Molybdenum (Mo)	mg/L	2	0.25		0.00012	0.000153	0.000108	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0011	0.00108	0.00126	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.06	0.08	0.078	-
Total Potassium (K)	mg/L	373-432	-		0.66	0.172	0.593	-
Total Rubidium (Rb)	mg/L	-	-		-	0.00025	0.00075	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.00050	<0.000050	0.000073	-
Total Silicon (Si)	mg/L	-	-		3.5	1.63	3.62	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		<0.000050	<0.000010	0.000018	-
Total Sodium (Na)	mg/L	-	<200, AO		1.47	1.49	1.1	-
Total Strontium (Sr)	mg/L	-	-		0.0424	0.034	0.0227	-
Total Sulphur (S)	mg/L	-	-		<3.0	<0.50	<0.50	-
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	<0.00020	-
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.000020	<0.000010	<0.000010	-
Total Thorium (Th)	mg/L	-	-		<0.00010	<0.00010	<0.00010	-
Total Tin (Sn)	mg/L	-	-		<0.00020	<0.00010	0.00012	-
Total Titanium (Ti)	mg/L	2	0.1		<0.0050	0.00134	0.0132	-
Total Tungsten (W)	mg/L	-	-		-	<0.00010	<0.00010	-
Total Uranium (U)	mg/L	0.3	20		<0.000020	<0.000010	0.000022	-
Total Vanadium (V)	mg/L	0.006	0.02		<0.0010	<0.00050	0.00169	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0051	0.0033	0.0065	-
Total Zirconium (Zr)	mg/L	-	-		0.0002	0.000148	<0.00090	-

Field	Units	BC MoE Guidelines (a)		CSR DW	E309751			
		Freshwater Aquatic Life	Drinking Water		21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20
Total Metals								
Total Aluminum	mg/L	0.1	0.2		1.55	0.154	0.250	0.627
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		0.00022	<0.00010	<0.00010	<0.00010
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.00083	0.00040	0.00089	0.00084
Total Barium (Ba)	mg/L	5	1.0, MAC		0.0198	0.0139	0.0144	0.0172
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.00010	<0.000100	<0.000100	<0.000100
Total Bismuth (Bi)	mg/L	-	-		<0.000050	<0.000050	<0.000050	<0.000050
Total Boron (B)	mg/L	1.2	5.0, MAC		<0.010	<0.010	<0.010	<0.010
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.0000559	0.0000342	0.0000155	0.0000223
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		5.04	5.51	6.88	7.42
Total Cesium (Cs)	mg/L	-	-		0.000084	<0.000010	0.000012	0.000039
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00157	0.00044	0.00056	0.00085
Total Cobalt (Co)	mg/L	0.11	-		0.00049	0.00026	0.00054	0.00063
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00711	0.00118	0.00205	0.00333
Total Iron (Fe)	mg/L	1	<0.3, AO		0.965	0.384	0.718	1.03
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.00037	<0.000050	0.000082	0.000180
Total Lithium (Li)	mg/L	-	-		<0.0010	<0.0010	<0.0010	<0.0010
Total Magnesium (Mg)	mg/L	-	700		1.26	1.38	1.70	1.83
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.0634	0.0450	0.103	0.102
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		0.0000115	<0.0000050	<0.0000050	<0.0000050
Total Molybdenum (Mo)	mg/L	2	0.25		0.000113	0.000063	0.000117	0.000103
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.00178	0.00059	0.00120	0.00162
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.097	0.061	<0.050	0.072
Total Potassium (K)	mg/L	373-432	-		1.44	0.439	1.07	1.39
Total Rubidium (Rb)	mg/L	-	-		0.00151	0.00064	0.00102	0.00117
Total Selenium (Se)	mg/L	0.002	0.01, MAC		0.000071	0.000055	0.000071	0.000110
Total Silicon (Si)	mg/L	-	-		6.3	2.48	4.39	4.81
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000027	<0.000010	<0.000010	0.000019
Total Sodium (Na)	mg/L	-	<200, AO		1.37	1.27	1.81	1.74
Total Strontium (Sr)	mg/L	-	-		0.0351	0.0413	0.0478	0.0504
Total Sulphur (S)	mg/L	-	-		<0.50	<0.50	<0.50	<0.50
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	<0.00020	<0.00020
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.000010	<0.000010	<0.000010	<0.000010
Total Thorium (Th)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010
Total Tin (Sn)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010
Total Titanium (Ti)	mg/L	2	0.1		0.0297	0.00201	0.00336	<0.00900
Total Tungsten (W)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010
Total Uranium (U)	mg/L	0.3	20		0.000044	<0.000010	<0.000010	0.000021
Total Vanadium (V)	mg/L	0.006	0.02		0.00285	<0.00050	0.00053	0.00103
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0096	0.0056	0.0046	0.0125
Total Zirconium (Zr)	mg/L	-	-		<0.0012	0.00022	0.00031	0.00033

Field	Units	BC MoE Guidelines (a)			21-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Total Metals							
Total Aluminum	mg/L	0.1	0.2	0.183	-	0.25	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	<0.00010	-	<0.00010	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	0.00041	-	0.00106	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.00890	-	0.0142	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.000100	-	<0.000100	
Total Bismuth (Bi)	mg/L	-	-	<0.000050	-	<0.000050	
Total Boron (B)	mg/L	1.2	5.0, MAC	<0.010	-	<0.010	
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.0000112	-	0.0000364	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	5.20	-	8.54	
Total Cesium (Cs)	mg/L	-	-	<0.000010	-	0.000020	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	<0.00050	-	0.00057	
Total Cobalt (Co)	mg/L	0.11	-	0.00020	-	0.00081	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	0.00218	-	0.00149	
Total Iron (Fe)	mg/L	1	<0.3, AO	0.356	-	1.24	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	0.000054	-	0.000074	
Total Lithium (Li)	mg/L	-	-	<0.0010	-	<0.0010	
Total Magnesium (Mg)	mg/L	-	700	1.45	-	2.30	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.0266	-	0.200	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	<0.0000050	-	0.0000084	
Total Molybdenum (Mo)	mg/L	2	0.25	0.000087	-	0.000079	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.00071	-	0.00117	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	<0.050	-	0.188	
Total Potassium (K)	mg/L	373-432	-	0.806	-	2.26	
Total Rubidium (Rb)	mg/L	-	-	0.00059	-	0.00266	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	0.000084	-	0.000088	
Total Silicon (Si)	mg/L	-	-	2.75	-	4.43	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	<0.000010	-	0.000015	
Total Sodium (Na)	mg/L	-	<200, AO	1.28	-	1.75	
Total Strontium (Sr)	mg/L	-	-	0.0378	-	0.0544	
Total Sulphur (S)	mg/L	-	-	<0.50	-	<0.50	
Total Tellurium (Te)	mg/L	-	-	<0.00020	-	<0.00020	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.000010	-	<0.000010	
Total Thorium (Th)	mg/L	-	-	<0.00010	-	<0.00010	
Total Tin (Sn)	mg/L	-	-	<0.00010	-	<0.00010	
Total Titanium (Ti)	mg/L	2	0.1	0.00246	-	0.00391	
Total Tungsten (W)	mg/L	-	-	<0.00010	-	<0.00010	
Total Uranium (U)	mg/L	0.3	20	<0.000010	-	0.000013	
Total Vanadium (V)	mg/L	0.006	0.02	<0.00050	-	0.00053	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	0.0034	-	0.0078	
Total Zirconium (Zr)	mg/L	-	-	0.00023	-	0.00129	

Field	Units	BC MoE Guidelines (a)			16-Apr-16	7-Jul-16	25-Oct-16
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Volatile Organic Compounds							
Benzene	µg/L				-	-	
Ethylbenzene	µg/L				-	-	
Methyl t-butyl ether (MTBE)	µg/L				-	-	
Styrene	µg/L				-	-	
Toluene	µg/L				-	-	
Xylene, m- and p-	µg/L				-	-	
Xylene, o-	µg/L				-	-	
Xylenes, total	µg/L				-	-	
Volatile Organic Compounds Surrogates							
bromofluorobenzene, 4-	%				-	-	
difluorobenzene, 1,4-	%				-	-	
Hydrocarbons							
EPH (C10-C19)	µg/L				-	-	
EPH (C19-C32)	µg/L				-	-	
TEH (C10-C30), BC	µg/L				-	-	
VHw (C6-C10)	µg/L				-	-	
VPHw	µg/L				-	-	
EPH (C19-C32)	µg/L				-	-	
Hydrocarbons Surrogates							
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	
dichlorotoluene, 3,4-	%				-	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			SW-1 -			
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19
Volatile Organic Compounds								
Benzene	µg/L				-	-	-	-
Ethylbenzene	µg/L				-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-
Styrene	µg/L				-	-	-	-
Toluene	µg/L				-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-
Xylene, o-	µg/L				-	-	-	-
Xylenes, total	µg/L				-	-	-	-
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	%				-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-
Hydrocarbons								
EPH (C10-C19)	µg/L				-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-
VPHw	µg/L				-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			E309751			
		Freshwater Aquatic Life	Drinking Water	CSR DW	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20
Field					21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20
Volatile Organic Compounds								
Benzene	µg/L				-	<0.50	<0.50	<0.50
Ethylbenzene	µg/L				-	<0.50	<0.50	<0.50
Methyl t-butyl ether (MTBE)	µg/L				-	<0.50	<0.50	<0.50
Styrene	µg/L				-	<0.50	<0.50	<0.50
Toluene	µg/L				-	<0.50	<0.50	<0.50
Xylene, m- and p-	µg/L				-	<0.50	<0.50	<0.50
Xylene, o-	µg/L				-	<0.50	<0.50	<0.50
Xylenes, total	µg/L				-	<0.75	<0.75	<0.75
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	%				-	112	94.8	82.2
difluorobenzene, 1,4-	%				-	94.9	96.6	93.4
Hydrocarbons								
EPH (C10-C19)	µg/L				-	<250	<250	<250
EPH (C19-C32)	µg/L				-	<250	<250	<250
TEH (C10-C30), BC	µg/L				-	<250	<250	-
VHw (C6-C10)	µg/L				-	<100	<100	<100
VPHw	µg/L				-	<100	<100	<100
EPH (C19-C32)	µg/L				-			
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (EPH surr)	%				-	95.3	111	49.5
dichlorotoluene, 3,4-	%				-	90.5	87.6	101

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			21-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW			
Volatile Organic Compounds							
Benzene	µg/L				<0.50	-	<0.50
Ethylbenzene	µg/L				<0.50	-	<0.50
Methyl t-butyl ether (MTBE)	µg/L				<0.50	-	<0.50
Styrene	µg/L				<0.50	-	<0.50
Toluene	µg/L				<0.50	-	1.34
Xylene, m- and p-	µg/L				<0.40	-	<0.40
Xylene, o-	µg/L				<0.30	-	<0.30
Xylenes, total	µg/L				<0.50	-	<0.50
Volatile Organic Compounds Surrogates							
bromofluorobenzene, 4-	%				93.1	-	91.60
difluorobenzene, 1,4-	%				101	-	107.00
Hydrocarbons							
EPH (C10-C19)	µg/L				<250	-	<250
EPH (C19-C32)	µg/L				<250	-	<250
TEH (C10-C30), BC	µg/L				-	-	-
VHw (C6-C10)	µg/L				<100	-	<100
VPHw	µg/L				<100	-	<100
EPH (C19-C32)	µg/L				-	-	<400
Hydrocarbons Surrogates							
bromobenzotrifluoride, 2- (EPH surr)	%				80	-	88.20
dichlorotoluene, 3,4-	%				112	-	115.00

Notes:

0.3	A shaded value means exceeded the freshwater aquatic life criteria
0.3	A shaded value means reading exceeded the drinking water quality criteria.
0.3	A shaded value means exceeded both the aquatic life and drinking water criteria.
0.3	A shaded value means reading had detection limit exceeding criteria.

- BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- Limit pH and temperature dependent.
- Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- Limit for chromium (IV)
- Limit for total, no dissolved concentrations
- copper (mg/L) =(0.094* Hardness)/1000
- Limit for hardness based on total dissolved CaCO³

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			SW-2 - I	
		Freshwater Aquatic Life	Drinking Water	CSR DW	16-Apr-16	7-Jul-16
Dissolved Oxygen	mg/L				-	-
Conductivity	µS/cm				-	-
pH	pH units				-	-
Temperature	°C				-	-
Turbidity	NTU				-	-
Flow Rate	m/sec				-	-
Lab Analyte						
Alkalinity (Total as CaCO3)	mg/L	-	-		21	22
Conductivity	uS/cm	-	700		44	45
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-
Total Hardness	mg/L	-	500 (i)		22	21
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.4	6.3
Chemical Oxygen Demand	mg/L	-	-		33	38
BOD	mg/L	-	-		<5.0	<4.0
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		<1.0	<1.0
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		<1.0	<1.0
Total Kjeldahl Nitrogen	mg/L	-	-		-	-
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		<0.03	<0.03
Chloride	mg/L				-	-
Fluoride	mg/L				-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		0.011	<0.01
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.01	<0.01
Sulfate	mg/L				-	-
Total Organic Carbon (C)	mg/L	-	4.0		9.4	9.1
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-
Dissolved Metals						
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-
Dissolved Cesium (Cs)				-	-	-
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	CSR DW	24-Jun-20	20-Aug-20	30-Sep-20	21-Apr-21	16-Jul-21	22-Oct-21
Dissolved Oxygen	mg/L				2.1	3.7	3.1	3.2	DRY	0.3
Conductivity	µS/cm				30.1	23.4	28.2	65.3	-	92.6
pH	pH units				5.92	5.85	6	6.47	-	6.22
Temperature	°C				17.5	14.3	9.8	4.6	-	5.2
Turbidity	NTU				-	2.68	1.15	2.48	-	3.71
Flow Rate	m/sec				0	0	0	0	-	0
Lab Analyte										
Alkalinity (Total as CaCO3)	mg/L	-	-		10.7	13	16.4	51.5	-	55.3
Conductivity	µS/cm	-	700		24.1	29.7	37.1	97.9	-	132
Dissolved Hardness (CaCO3)	mg/L	-	500		12.2	14.6	16.3	45.3	-	65
Total Hardness	mg/L	-	500 (i)		13.4	14.1	15.7	45.3	-	63.4
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.51	6.54	7.02	6.96	-	6.68
Chemical Oxygen Demand	mg/L	-	-		49	44	36	26	-	168
BOD	mg/L	-	-		-	-	-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		0.702	0.369	0.481	0.277	-	1.47
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0095	0.521	0.0127	0.0059	-	0.0064
Chloride	mg/L				<0.50	<0.50	<0.50	<0.50	-	0.66
Fluoride	mg/L				<0.020	<0.020	<0.020	0.044	-	<0.072
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0050	<0.0050	0.0065	0.0177	-	0.0121
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		0.0022	<0.0010	<0.0010	<0.0010	-	<0.0010
Sulfate	mg/L				<0.30	<0.30	<0.30	<0.30	-	0.33
Total Organic Carbon (C)	mg/L	-	4.0		10.8	8.76	13.6	11.1	-	44
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-
Dissolved Metals										
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.0188	0.0156	0.0502	0.147	-	0.211
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-	0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	0.00039	0.00035	0.00042	0.00026	-	0.00310
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.00682	0.00568	0.00728	0.00961	-	0.0184
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	<0.000100	<0.000100	<0.000100	-	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	<0.010	<0.010	<0.010	-	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.0000388	0.0000275	0.0000216	0.0000066	-	0.0000873
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	3.53	4.24	4.74	12.8	-	17.7
Dissolved Cesium (Cs)					<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.00011	<0.00010	0.00018	<0.00050	-	<0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00014	0.00012	0.00012	<0.00010	-	0.00082
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00066	0.00033	0.00026	0.00088	-	0.00274
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.205	0.352	0.275	0.169	-	1.29
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	<0.000050	0.000192	<0.000050	<0.000050	-	0.000114
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Dissolved Magnesium (Mg)	mg/L	-	700	-	0.829	0.973	1.08	3.23	-	5.04

Field	Units	BC MoE Guidelines (a)			SW-2 - I	
		Freshwater Aquatic Life	Drinking Water	CSR DW	16-Apr-16	7-Jul-16
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-
Dissolved Rubidium (Rb)				-	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	-	-
Dissolved Tellurium (Te)				-	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-
Dissolved Thorium (Th)				-	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-
Dissolved Tungsten (W)				0.003 ⁽²⁾	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-

Field	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	CSR DW	24-Jun-20	20-Aug-20	30-Sep-20	21-Apr-21	16-Jul-21	22-Oct-21
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0400	0.0394	0.0374	0.00754	-	0.225
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	<0.0000050	0.0000060	<0.0000050	-	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000068	0.000133	0.000128	<0.000050	-	<0.000050
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	<0.00050	<0.00050	<0.00050	<0.00050	-	0.00096
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	<0.050	0.070	0.072	<0.050	-	0.817
Dissolved Potassium (K)	mg/L	373-432	-	-	0.229	1.13	2.73	0.410	-	6.19
Dissolved Rubidium (Rb)				-	0.00022	0.00069	0.00161	<0.00020	-	0.00162
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	<0.000050	<0.000050	<0.000050	0.000053	-	0.000076
Dissolved Silicon (Si)	mg/L	-	-	-	0.997	0.966	1.42	4.09	-	3.56
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	<0.000010	<0.000010	-	0.000016
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	0.427	0.181	0.700	2.26	-	2.42
Dissolved Strontium (Sr)	mg/L	-	-	-	0.0241	0.0299	0.0324	0.0700	-	0.0874
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Dissolved Tellurium (Te)				-	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010
Dissolved Thorium (Th)				-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	0.00044	0.00038	0.00136	0.00259	-	0.00456
Dissolved Tungsten (W)				0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	<0.000010	<0.000010	<0.000010	<0.000010	-	0.000053
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	<0.00050	<0.00050	<0.00050	-	0.00071
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0113	0.0137	0.0174	0.0013	-	0.0176
Dissolved Zirconium (Zr)	mg/L	-	-	-	<0.00020	<0.00020	<0.00020	<0.00040	-	0.00032

Field	Units	BC MoE Guidelines (a)			SW-2 - I	
		Freshwater Aquatic Life	Drinking Water	CSR DW	16-Apr-16	7-Jul-16
Total Metals						
Total Aluminum	mg/L	0.1	0.2		0.475	1.640
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		0.0002	0.0004
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.001	0.0015
Total Barium (Ba)	mg/L	5	1.0, MAC		0.014	0.024
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.0001	<0.0001
Total Bismuth (Bi)	mg/L	-	-		<0.0001	<0.0001
Total Boron (B)	mg/L	1.2	5.0, MAC		0.004	0.015
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.00004	0.00051
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		6.2	6.2
Total Cesium (Cs)	mg/L	-	-		-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.0007	0.0021
Total Cobalt (Co)	mg/L	0.11	-		0.00068	0.00082
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.004	0.0066
Total Iron (Fe)	mg/L	1	<0.3, AO		1.10	2.07
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.0003	0.0006
Total Lithium (Li)	mg/L	-	-		0.0003	0.0008
Total Magnesium (Mg)	mg/L	-	700		1.51	1.27
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.129	0.123
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00002	<0.00002
Total Molybdenum (Mo)	mg/L	2	0.25		0.0002	0.0002
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0012	0.0021
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.07	0.11
Total Potassium (K)	mg/L	373-432	-		0.93	0.89
Total Rubidium (Rb)	mg/L	-	-		-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.0005	<0.0005
Total Silicon (Si)	mg/L	-	-		4.8	5
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		<0.00005	<0.00005
Total Sodium (Na)	mg/L	-	<200, AO		1.81	1.02
Total Strontium (Sr)	mg/L	-	-		0.04	0.035
Total Sulphur (S)	mg/L	-	-		<1	<1
Total Tellurium (Te)	mg/L	-	-		<0.0002	<0.0002
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.00002	<0.00002
Total Thorium (Th)	mg/L	-	-		<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-		<0.0002	<0.0002
Total Titanium (Ti)	mg/L	2	0.1		0.009	0.034
Total Tungsten (W)	mg/L	-	-		-	-
Total Uranium (U)	mg/L	0.3	20		<0.00002	0.00003
Total Vanadium (V)	mg/L	0.006	0.02		0.002	0.003
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.006	0.009
Total Zirconium (Zr)	mg/L	-	-		0.0003	0.0014
Volatile Organic Compounds						
Benzene	µg/L				-	-
Ethylbenzene	µg/L				-	-

Field	Units	BC MoE Guidelines (a)			E309752					
		Freshwater Aquatic Life	Drinking Water	CSR DW	25-Oct-16	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19	21-Nov-19
Total Metals										
Total Aluminum	mg/L	0.1	0.2		0.031	0.047	0.033	0.837	1.830	0.189
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		0.0002	<0.00010	<0.00010	0.00018	0.00011	<0.00010
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.0009	0.00066	0.00048	0.00054	0.00131	0.00059
Total Barium (Ba)	mg/L	5	1.0, MAC		0.014	0.007	0.008	0.0139	0.049	0.00887
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Total Bismuth (Bi)	mg/L	-	-		<0.0001	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050
Total Boron (B)	mg/L	1.2	5.0, MAC		<0.004	0.005	<0.010	<0.010	<0.010	<0.010
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.00004	0.000027	0.0000052	0.0000443	0.000352	0.000106
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		7.3	4.04	3.44	3.27	9.28	4.1
Total Cesium (Cs)	mg/L	-	-		-	-	<0.000010	0.000056	0.000174	0.000011
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		<0.0005	<0.00050	0.00018	0.00089	0.00162	0.00031
Total Cobalt (Co)	mg/L	0.11	-		0.00022	0.00014	0.0003	0.00045	0.0012	0.00025
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.0004	0.00075	<0.00050	0.00352	0.00594	0.00136
Total Iron (Fe)	mg/L	1	<0.3, AO		0.84	0.31	0.54	0.794	3.31	0.526
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		<0.0001	<0.00010	<0.000050	0.000202	0.000664	0.000182
Total Lithium (Li)	mg/L	-	-		0.0001	0.0001	<0.0010	<0.0010	0.0014	<0.0010
Total Magnesium (Mg)	mg/L	-	700		1.94	0.89	0.793	0.791	2.35	1.27
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.101	0.0304	0.117	0.0574	0.258	0.18
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00002	<0.00002	<0.0000050	0.0000091	<0.000025	<0.0000050
Total Molybdenum (Mo)	mg/L	2	0.25		<0.0001	<0.00010	0.000095	0.000108	0.000193	0.000143
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0002	<0.00020	<0.00050	0.00126	0.00276	<0.00050
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.14	<0.050	0.079	0.078	0.354	0.209
Total Potassium (K)	mg/L	373-432	-		3.19	0.86	0.732	0.593	1.83	3.28
Total Rubidium (Rb)	mg/L	-	-		-	-	0.00049	0.00075	0.00241	0.00151
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.0005	<0.00050	<0.000050	0.000073	<0.000050	<0.000050
Total Silicon (Si)	mg/L	-	-		2.7	2	1.64	3.62	4.36	1.38
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		<0.00005	<0.000050	<0.000010	0.000018	0.000028	<0.000010
Total Sodium (Na)	mg/L	-	<200, AO		1.15	0.72	0.795	1.1	1.07	0.493
Total Strontium (Sr)	mg/L	-	-		0.055	0.026	0.0225	0.0227	0.0655	0.0254
Total Sulphur (S)	mg/L	-	-		<1	<3.0	<0.50	<0.50	<0.50	<0.50
Total Tellurium (Te)	mg/L	-	-		<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.00002	0.000048	<0.000010	<0.000010	0.000016	<0.000010
Total Thorium (Th)	mg/L	-	-		<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Total Tin (Sn)	mg/L	-	-		<0.0002	<0.00020	<0.00010	0.00012	<0.00010	<0.00010
Total Titanium (Ti)	mg/L	2	0.1		<0.005	<0.0050	0.00096	0.0132	0.022	0.00728
Total Tungsten (W)	mg/L	-	-		-	-	<0.00010	<0.00010	<0.00010	<0.00010
Total Uranium (U)	mg/L	0.3	20		<0.00002	<0.000020	<0.000010	0.000022	0.000022	<0.000010
Total Vanadium (V)	mg/L	0.006	0.02		<0.001	<0.0010	<0.00050	0.00169	0.00306	0.00098
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.009	<0.0040	0.0054	0.0065	0.0243	0.0159
Total Zirconium (Zr)	mg/L	-	-		<0.0001	<0.00010	<0.000060	<0.00090	<0.00020	<0.00020
Volatile Organic Compounds										
Benzene	µg/L				-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-

Field	Units	BC MoE Guidelines (a)			24-Jun-20	20-Aug-20	30-Sep-20	21-Apr-21	16-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW						
Total Metals										
Total Aluminum	mg/L	0.1	0.2	0.0703	0.0183	0.130	0.181	-	0.212	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	<0.00010	<0.00010	<0.00010	<0.00010	-	0.00012	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	0.00049	0.00037	0.00070	0.00029	-	0.00317	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.0113	0.00620	0.0103	0.0101	-	0.0195	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.000100	<0.000100	<0.000100	<0.000100	-	<0.000100	
Total Bismuth (Bi)	mg/L	-	-	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	
Total Boron (B)	mg/L	1.2	5.0, MAC	0.012	<0.010	<0.010	<0.010	-	0.012	
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.0000555	0.0000180	0.0000403	0.0000111	-	0.0000987	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	3.95	4.04	4.46	12.7	-	17.1	
Total Cesium (Cs)	mg/L	-	-	<0.000010	<0.000010	0.000010	<0.000010	-	0.000012	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.00014	<0.00010	0.00029	<0.00050	-	0.00050	
Total Cobalt (Co)	mg/L	0.11	-	0.00052	0.00016	0.00054	0.00011	-	0.00087	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	0.00068	<0.00050	0.00056	0.00129	-	0.00311	
Total Iron (Fe)	mg/L	1	<0.3, AO	0.807	0.547	1.15	0.211	-	1.47	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	0.000142	<0.000050	<0.000050	<0.000050	-	0.000144	
Total Lithium (Li)	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	
Total Magnesium (Mg)	mg/L	-	700	0.849	0.976	1.10	3.30	-	5.03	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.179	0.0511	0.203	0.00843	-	0.245	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	<0.000050	<0.000050	<0.000050	<0.000050	-	0.000062	
Total Molybdenum (Mo)	mg/L	2	0.25	0.000194	0.000140	0.000356	0.000057	-	0.000073	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	<0.00050	<0.00050	<0.00050	0.00054	-	0.00107	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	0.168	0.103	0.300	<0.050	-	0.831	
Total Potassium (K)	mg/L	373-432	-	0.306	1.12	2.65	0.424	-	6.08	
Total Rubidium (Rb)	mg/L	-	-	0.00023	0.00071	0.00158	0.00023	-	0.00169	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	<0.000050	<0.000050	<0.000050	0.000086	-	0.000129	
Total Silicon (Si)	mg/L	-	-	1.12	0.92	1.70	4.18	-	3.71	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	<0.000010	<0.000010	<0.000010	<0.000010	-	0.000033	
Total Sodium (Na)	mg/L	-	<200, AO	0.470	0.168	0.721	2.42	-	2.45	
Total Strontium (Sr)	mg/L	-	-	0.0266	0.0277	0.0298	0.0715	-	0.0839	
Total Sulphur (S)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50	
Total Tellurium (Te)	mg/L	-	-	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	
Total Thorium (Th)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Tin (Sn)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Titanium (Ti)	mg/L	2	0.1	0.00188	0.00046	0.00352	0.00271	-	0.00486	
Total Tungsten (W)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Uranium (U)	mg/L	0.3	20	<0.000010	<0.000010	<0.000010	0.000011	-	0.000051	
Total Vanadium (V)	mg/L	0.006	0.02	<0.00050	<0.00050	<0.00050	<0.00050	-	0.00074	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	0.0148	0.0118	0.0216	<0.0030	-	0.0196	
Total Zirconium (Zr)	mg/L	-	-	<0.00020	<0.00020	<0.00020	0.00030	-	0.00071	
Volatile Organic Compounds										
Benzene	µg/L			<0.50	<0.50	<0.50	-	-	<0.50	
Ethylbenzene	µg/L			<0.50	<0.50	<0.50	-	-	<0.50	

Field	Units	BC MoE Guidelines (a)			SW-2 - I	
		Freshwater Aquatic Life	Drinking Water	CSR DW	16-Apr-16	7-Jul-16
Methyl t-butyl ether (MTBE)	µg/L				-	-
Styrene	µg/L				-	-
Toluene	µg/L				-	-
Xylene, m- and p-	µg/L				-	-
Xylene, o-	µg/L				-	-
Xylenes, total	µg/L				-	-
Volatile Organic Compounds Surrogates						
bromofluorobenzene, 4-	%				-	-
difluorobenzene, 1,4-	%				-	-
Hydrocarbons						
EPH (C10-C19)	µg/L				-	-
EPH (C19-C32)	µg/L				-	-
TEH (C10-C30), BC	µg/L				-	-
VHw (C6-C10)	µg/L				-	-
VPHw	µg/L				-	-
EPH (C19-C32)	µg/L				-	-
Hydrocarbons Surrogates						
bromobenzotrifluoride, 2- (EPH surr	%				-	-
dichlorotoluene, 3,4-	%				-	-

Notes:

0.3	A shaded value means exceeded the freshwater aquatic life criteria
0.3	A shaded value means reading exceeded the drinking water quality criteria.
0.3	A shaded value means exceeded both the aquatic life and drinking water criteria.
0.3	A shaded value means reading had detection limit exceeding criteria.

- BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- Limit pH and temperature dependent.
- Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- Limit for chromium (IV)
- Limit for total, no dissolved concentrations
- copper (mg/L) = (0.094* Hardness)/1000
- Limit for hardness based on total dissolved CaCO³
- See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- Limit pH and temperature dependent.
- Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- Limit for chromium (IV)
- Limit for total, no dissolved concentrations

Field	Units	BC MoE Guidelines (a)			E309752					
		Freshwater Aquatic Life	Drinking Water	CSR DW	25-Oct-16	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19	21-Nov-19
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-
Hydrocarbons										
EPH (C10-C19)	µg/L				-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr	%				-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations

Field	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	CSR DW	24-Jun-20	20-Aug-20	30-Sep-20	21-Apr-21	16-Jul-21	22-Oct-21
Methyl t-butyl ether (MTBE)	µg/L				<0.50	<0.50	<0.50	-	-	<0.50
Styrene	µg/L				<0.50	<0.50	<0.50	-	-	1.54
Toluene	µg/L				<0.50	<0.50	<0.50	-	-	6.42
Xylene, m- and p-	µg/L				<0.50	<0.50	<0.50	-	-	<0.40
Xylene, o-	µg/L				<0.50	<0.50	<0.50	-	-	<0.30
Xylenes, total	µg/L				<0.75	<0.75	<0.75	-	-	<0.50
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	%				113	92.1	83.2	-	-	94.3
difluorobenzene, 1,4-	%				95.5	106	97.5	-	-	107
Hydrocarbons										
EPH (C10-C19)	µg/L				<250	<250	<250	-	-	<250
EPH (C19-C32)	µg/L				<250	<250	<250	-	-	<250
TEH (C10-C30), BC	µg/L				<250	-	-	-	-	-
VHw (C6-C10)	µg/L				<100	<100	<100	-	-	<100
VPHw	µg/L				<100	<100	<100	-	-	<100
EPH (C19-C32)	µg/L				-	-	-	-	-	<400
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr	%				104	116	81.6	-	-	97.6
dichlorotoluene, 3,4-	%				98.6	108	111	-	-	115

Notes:

0.3	A shaded value means exceeded the freshwater aquatic life criteria
0.3	A shaded value means reading exceeded the drinking water quality criteria.
0.3	A shaded value means exceeded both the aquatic life and drinking water criteria.
0.3	A shaded value means reading had detection limit exceeding criteria.

- BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- Limit pH and temperature dependent.
- Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- Limit for chromium (IV)
- Limit for total, no dissolved concentrations
- copper (mg/L) = (0.094* Hardness)/1000
- Limit for hardness based on total dissolved CaCO³
- See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- Limit pH and temperature dependent.
- Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- Limit for chromium (IV)
- Limit for total, no dissolved concentrations

	Units	BC MoE Guidelines (a)			SW-2 - I	
		Freshwater Aquatic Life	Drinking Water	CSR DW		
Field					16-Apr-16	7-Jul-16

h.copper (mg/L) =(0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

	Units	BC MoE Guidelines (a)			E309752					
		Freshwater Aquatic Life	Drinking Water	CSR DW						
Field					25-Oct-16	14-Jun-17	28-May-18	16-Apr-19	13-Aug-19	21-Nov-19

h.copper (mg/L) =(0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

	Units	BC MoE Guidelines (a)								
		Freshwater Aquatic Life	Drinking Water	CSR DW						
Field					24-Jun-20	20-Aug-20	30-Sep-20	21-Apr-21	16-Jul-21	22-Oct-21

h.copper (mg/L) =(0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Table 1. Hazelton Surface Water Quality Data

	Units	BC MoE Guidelines (a)															
		Freshwater Aquatic Life	Drinking Water	CSR DW		13-Aug-19	21-Nov-19	24-Jun-20	20-Aug-20	DUP	RPD	30-Sep-20	21-Apr-21	20-Jul-21	22-Oct-21	DUP	RPD
Field																	
Dissolved Oxygen	mg/L	-	-	-	1.6	7.1	3.4	3.2	-	-	3.90	5.50	6.00	6.00	-	-	-
Conductivity	µS/cm	-	-	-	201.6	71.8	172	125	-	-	74.20	60.60	166.50	122.40	-	-	-
pH	pH units	-	-	-	6.37	6.76	5.35	5.55	-	-	5.88	6.22	8.44	6.36	-	-	-
Temperature	°C	-	-	-	17.1	1.2	16.8	14.5	-	-	11.30	7.90	18.80	5.50	-	-	-
Turbidity	NTU	-	-	-	4.9	7.4	-	1.04	-	-	1.91	1.04	1.13	1.05	-	-	-
Flow Rate	m³/sec	-	-	-	-	-	-	0.25	-	-	0.093	0.106	0.00	0.016	-	-	-
Lab Analyte																	
Alkalinity (Total as CaCO3)	mg/L	-	-	-	-	19.7	19.6	33.6	34	1.18	17.30	16.60	24.30	26.20	26.20	0.00%	0.00%
Conductivity	uS/cm	-	-	-	700	132	199	163	162	0.62	97.70	90.90	181.00	196.00	196.00	0.00%	0.00%
Dissolved Hardness (CaCO3)	mg/L	-	-	-	500	36.3	45	42.7	42.5	0.47	25.10	43.10	46.20	40.10	41.10	14.14%	14.14%
Total Hardness	mg/L	-	-	-	500 (i)	-	45.5	41.7	41.8	0.24	31.40	24.40	47.00	42.70	41.90	1.89%	1.89%
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC	-	7.2	7.12	6.63	6.70	6.7	0.00	6.93	6.58	6.93	6.61	6.63	0.30%	0.30%
Chemical Oxygen Demand	mg/L	-	-	-	59	100	95	105	102	2.90	104.00	62.00	80.00	107.00	111.00	3.67%	3.67%
BOD	mg/L	-	-	-	2.1	-	-	-	-	-	-	-	-	-	-	#VALUE!	#VALUE!
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO	-	-	-	-	-	-	-	-	-	-	-	-	-	#VALUE!
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO	-	-	-	-	-	-	-	-	-	-	-	-	-	#VALUE!
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	1.52	1.23	1.22	1.27	4.02	1.04	0.661	0.918	1.07	1.10	2.76%	2.76%
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline	-	0.0123	0.046	0.016	0.0143	0.0149	4.11	0.0213	0.0130	0.0094	0.0140	0.0088	45.61%	45.61%
Chloride	mg/L	-	-	-	48.7	25	44.2	26.8	26.5	1.13	15.90	15.30	38.10	39.40	39.40	0.00%	0.00%
Fluoride	mg/L	-	-	-	0.038	0.024	0.03	0.047	0.047	0.00	0.04	0.034	0.038	0.032	0.031	3.17%	3.17%
Nitrate (N)	mg/L	200 (max)	10 MAC	-	0.0059	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	#VALUE!	#VALUE!
Nitrite (N)	mg/L	0.06-0.6 (max) (c)	1.0 MAC	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	#VALUE!
Sulfate	mg/L	-	-	-	<0.30	0.55	<0.30	<0.30	<0.30	-	<0.30	<0.30	<0.30	0.46	0.43	6.74%	6.74%
Total Organic Carbon (C)	mg/L	-	4.0	-	-	41.1	35.8	35.8	37.9	5.70	36.80	21.40	25.40	33.70	32.60	3.32%	3.32%
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	-	-	-	-	-	-	-	-	-	#VALUE!	#VALUE!
Dissolved Metals																	
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	0.45	0.168	0.201	0.208	3.42	0.425	0.204	0.0574	0.209	0.168	21.75%	21.75%
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	#VALUE!
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	0.00058	0.00082	0.00090	0.00083	8.09	0.00074	0.00051	0.00080	0.00070	0.00054	25.81%	25.81%
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	0.0162	0.0221	0.0179	0.0176	1.69	0.0164	0.0102	0.0156	0.0168	0.0155	8.05%	8.05%
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	<0.00010	<0.000100	<0.000100	<0.000100	-	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	#VALUE!	#VALUE!
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	#VALUE!	#VALUE!
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	#VALUE!	#VALUE!
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	0.0000128	0.0000971	0.0000052	0.0000075	36.22	0.0000110	0.0000101	0.0000115	0.0000062	0.0000051	19.47%	19.47%
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	10.5	13.6	13.0	13.0	0.00	9.88	7.34	13.3	14.0	12.0	15.38%	15.38%
Dissolved Cesium (Cs)	mg/L	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	#VALUE!
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	0.0005	0.00038	0.00050	0.00048	4.08	0.00062	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	#VALUE!
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	0.00019	0.00019	0.00038	0.00038	0.00	0.00018	0.00016	0.00018	0.00032	0.00026	20.69%	20.69%
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	0.00233	0.00073	0.00072	0.00067	7.19	0.00182	0.00145	0.00038	0.00099	0.00103	3.96%	3.96%
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	0.707	0.514	0.886	0.891	0.56	0.750	0.406	0.440	0.840	0.712	16.49%	16.49%
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	0.0	0.000052	0.000100	0.000109	8.61	0.000170	0.000097	0.000054	0.000070	0.000060	15.38%	15.38%
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	-	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	#VALUE!
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	2.41	2.66	2.48	2.46	0.81	2.05	1.64	2.41	2.72	2.46	10.04%	10.04%
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	0.0249	0.0296	0.0716	0.0697	2.69	0.0177	0.0283	0.0368	0.0658	0.0589	11.07%	11.07%
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	0.000008	<0.0000050	<0.0000050	<0.0000050	-	0.0000193	<0.0000050	<0.0000050	<0.0000050	<0.0000050	#VALUE!	#VALUE!
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	0.000067	<0.000050	0.000137	0.000124	9.96	0.000085	0.000349	<0.000050	<0.000050	<0.000050	#VALUE!	#VALUE!
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	0.00065	0.00108	0.00118	0.00112	5.22	0.00117	0.00061	0.00066	0.00088	0.00082	7.06%	7.06%
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	#VALUE!	#VALUE!
Dissolved Potassium (K)	mg/L	373-432	-	-	-	0.688	<0.050	0.389	0.376	3.40	0.773	0.692	0.099	0.701	0.635	9.88%	9.88%
Dissolved Rubidium (Rb)	mg/L	-	-	-	-	0.00042	<0.00020	0.00028	0.00032	13.33	0.00069	0.00047	<0.00020	0.00040	0.00038	5.13%	5.13%
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	0.00	<0.000050	0.000080	0.000117	37.56	0.000140	0.000070	0.000063	0.000069	<0.000050	#VALUE!	#VALUE!
Dissolved Silicon (Si)	mg/L	-	-	-	-	3.70	0.925	2.72	2.70	0.74	3.51	1.23	4.73	2.88	2.58	10.99%	10.99%
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	0.00	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	#VALUE!
Dissolved Sodium (Na)	mg/L	<200, AO	<200, AO	200 ⁽²⁾	-	13.10	23.8	19.8	19.4	2.04	10.4	8.61	16.7	21.9	21.9	9.15%	9.15%
Dissolved Strontium (Sr)	mg/L	-	-	-	-	0.07	0.0960	0.0889	0.0885	0.45	0.0671	0.0455	0.102	0.0862	0.0764	12.05%	12.05%
Dissolved Sulphur (S)	mg/L	-	-	-	-	0.52	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	#VALUE!
Dissolved Tellurium (Te)	mg/L	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	#VALUE!	#VALUE!
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	#VALUE!
Dissolved Thorium (Th)	mg/L	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	#VALUE!
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	#VALUE!
Dissolved Titanium (Ti)	mg/L	2	-	-	-	0.01	0.00106	0.00156	0.00154	1.29	0.00683	0.00220	0.00044	0.00212	0.00118	56.97%	56.97%
Dissolved Tungsten (W)	mg/L	-	-	0.003 ⁽²⁾	-	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	#VALUE!
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	0.00	<0.000010	<0.000010	<0								

Field	Units	BC MoE Guidelines (a)												
		Freshwater Aquatic Life	Drinking Water	CSR DW	26-Jul-04	25-May-06	8-Aug-07	10-Jun-08	25-Aug-09	16-Mar-10	22-Jun-10	30-Sep-10	28-Feb-12	14-Aug-12
Total Metals														
Total Aluminum	mg/L	0.1	0.2		0.070	0.200	0.240	0.193	0.363	0.238	0.120	0.050	0.323	0.330
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		<0.05	ND	ND	ND	ND	ND	0.00008	ND	0.00006	ND
Total Arsenic (As)	mg/L	0.005	0.025, MAC		<0.05	ND	ND	0.0007	0.001	0.0004	0.00093	0.0006	0.00058	0.00102
Total Barium (Ba)	mg/L	5	1.0, MAC		0.024	0.014	0.024	0.018	0.016	0.019	0.016	0.024	0.022	0.020
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.0002	ND	ND	ND	ND	ND	0.00001	ND	ND	ND
Total Bismuth (Bi)	mg/L	-	-		<0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	mg/L	1.2	5.0, MAC		<0.008	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		<0.002	ND	ND	0.00006	0.00002	0.00004	0.000298	ND	0.000044	0.000145
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		16.3	12.7	13.2	11.8	11.2	12.2	13.1	14.9	12.8	11.8
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		<0.005	ND	ND	0.001	ND	ND	0.0008	ND	0.0008	ND
Total Cobalt (Co)	mg/L	0.11	-		<0.005	ND	ND	ND	ND	ND	0.000156	ND	0.00031	0.00083
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		<0.005	ND	0.007	0.0023	0.0067	0.0021	0.0033	0.0014	0.0027	0.00232
Total Iron (Fe)	mg/L	1	<0.3, AO		0.62	0.42	2.13	0.50	0.67	0.60	0.31	0.79	1.11	1.18
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		<0.03	ND	ND	ND	0.0004	0.0005	0.000188	ND	0.00027	0.0005
Total Lithium (Li)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Magnesium (Mg)	mg/L	-	700		3.25	2.63	2.53	2.44	2.61	2.56	3.11	3.14	2.6	2.5
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.06	0.021	0.17	0.05	0.041	0.067	0.0152	0.075	0.0736	0.188
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.00005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Molybdenum (Mo)	mg/L	2	0.25		<0.005	ND	ND	ND	ND	ND	0.00011	ND	0.00092	ND
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		<0.008	ND	ND	0.001	ND	ND	0.00098	0.001	0.0011	ND
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		<0.1	ND	ND	ND	ND	ND	ND	ND	ND	0.176
Total Potassium (K)	mg/L	373-432	-		<1	ND	ND	0.71	0.32	0.85	0.48	1.36	0.8	0.638
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		<0.03	ND	ND	ND	ND	ND	0.00006	ND	0.00007	ND
Total Silicon (Si)	mg/L	-	-		<0.01	0.36	0.41	0.486	0.547	2.95	ND	0.135	4.15	0.481
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		32.4	ND	ND	0.000006	ND	ND	ND	ND	0.000006	ND
Total Sodium (Na)	mg/L	-	<200, AO		0.114	21.7	23.3	16.3	21.9	19.5	27.5	30	27.9	21
Total Strontium (Sr)	mg/L	-	-		0.3	0.076	0.09	0.075	0.08	0.076	0.0924	0.106	0.077	0.0827
Total Sulphur (S)	mg/L	-	-		<0.05	0.3	0.7	ND	ND	3	ND	ND	ND	ND
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.03	ND	ND	ND	ND	ND	ND	ND	0.000004	ND
Total Thorium (Th)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Tin (Sn)	mg/L	-	-		<0.02	ND	ND	ND	ND	ND	0.00003	ND	0.0002	ND
Total Titanium (Ti)	mg/L	2	0.1		<0.003	ND	ND	ND	0.01	ND	0.0013	ND	ND	0.0064
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		-	-	-	ND	ND	ND	0.000007	ND	0.000014	ND
Total Vanadium (V)	mg/L	0.006	0.02		<0.005	ND	ND	ND	ND	ND	ND	ND	0.0007	ND
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		<0.005	0.01	0.023	0.014	0.01	0.028	0.0061	0.006	0.008	0.0096
Total Zirconium (Zr)	mg/L	-	-		<0.005	ND	ND	ND	ND	ND	0.0001	ND	0.0003	ND

Field	Units	BC MoE Guidelines (a)			SW-5 - E287409														
		Freshwater Aquatic Life	Drinking Water	CSR DW	Beaver Pond Outlet														
					4-Oct-12	27-Mar-13	17-Oct-13	7-Jul-14	25-Nov-14	26-May-15	1-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17	28-May-18	16-Apr-19	
Total Metals																			
Total Aluminum	mg/L	0.1	0.2		0.222	1.190	0.227	-	0.345	0.258	0.267	0.216	0.102	0.301	0.238	1.420	0.619	0.364	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		ND	ND	ND	-	ND	0.00010	<0.0001	<0.0001	<0.0001	0.00020	<0.00010	0.00018	<0.00010	0.00011	
Total Arsenic (As)	mg/L	0.005	0.025, MAC		0.00066	0.00117	0.00055	-	0.0008	0.00060	<0.0005	0.00060	0.00070	0.00060	0.00094	0.0021	0.00224	0.00081	
Total Barium (Ba)	mg/L	5	1.0, MAC		0.021	0.066	0.019	-	0.031	0.01100	0.01500	0.01000	0.02300	0.01500	0.01790	0.033	0.019	0.012	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		ND	ND	ND	-	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	
Total Bismuth (Bi)	mg/L	-	-		ND	ND	ND	-	ND	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000050	<0.000050	
Total Boron (B)	mg/L	1.2	5.0, MAC		ND	ND	ND	-	ND	0.00900	0.00600	0.00700	0.00800	0.00900	0.01000	0.038	<0.010	<0.010	
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.000023	0.000071	0.000012	-	0.000021	0.00009	0.00002	0.000021	<0.00001	0.00004	0.000011	0.000025	0.0000202	0.0000137	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		13.2	31.3	14.9	-	17.4	9.4	12.5	10.1	14.5	9.4	9.8	15	9.42	8.61	
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-	-	-	0.000057	0.000016	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		ND	0.0015	ND	-	ND	0.0005	0.0006	0.0005	<0.0005	0.0006	0.0005	0.00168	0.00087	0.00048	
Total Cobalt (Co)	mg/L	0.11	-		ND	0.00157	ND	-	0.00125	0.0001	0.0003	0.0001	0.0002	0.0002	0.0005	0.00099	0.00098	0.0003	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00174	0.00335	0.00118	-	0.00227	0.0028	0.0016	0.0036	0.0004	0.0016	0.0023	0.00452	0.00214	0.00202	
Total Iron (Fe)	mg/L	1	<0.3, AO		0.61	4.25	0.73	-	2.1	0.43	0.82	0.42	0.54	0.65	0.86	2.46	1.62	0.731	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.00029	0.00139	0.0002	-	0.00032	0.00010	0.00010	0.00030	<0.0001	0.00010	0.00030	0.00163	0.000597	0.000175	
Total Lithium (Li)	mg/L	-	-		ND	ND	ND	-	ND	0.00030	0.00030	0.00020	0.00030	0.00020	0.0011	<0.0010	<0.0010		
Total Magnesium (Mg)	mg/L	-	700		3.22	5.92	2.94	-	3.71	2.39000	2.68000	2.33000	2.28000	2.31000	2.16000	3.34	2.13	1.89	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.114	0.53	0.0755	-	0.653	0.03240	0.07060	0.026	0.060	0.031	0.132	0.172	0.236	0.0517	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		ND	ND	ND	-	ND	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000050	0.000006		
Total Molybdenum (Mo)	mg/L	2	0.25		ND	ND	ND	-	ND	<0.0001	<0.0001	<0.0001	<0.0001	0.00010	0.00018	0.00023	0.000107	0.000086	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		ND	0.0022	ND	-	0.0014	0.00090	0.00130	0.00100	0.00050	0.00080	0.00097	0.00248	0.00164	0.00083	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.08	0.222	0.058	-	0.087	0.0490	0.0300	<0.02	0.0300	<0.02	0.077	0.069	0.083	<0.050	
Total Potassium (K)	mg/L	373-432	-		1.54	2.04	0.848	-	1.18	0.52	0.39	0.51	0.11	0.48	2.47	1.26	1.09	0.956	
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-	-	-	0.00091	0.00056	
Total Selenium (Se)	mg/L	0.002	0.01, MAC		ND	ND	ND	-	ND	0.00060	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	0.000054	0.000066	
Total Silicon (Si)	mg/L	-	-		1.24	6.22	1.78	-	3.19	1.40	3.00	1.10	0.60000	2.90	1.60	3.6	2.35	2.87	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		ND	0.000024	ND	-	0.000026	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050	<0.000010	<0.000010	
Total Sodium (Na)	mg/L	-	<200, AO		39.2	75.7	40.7	-	29.8	16.2	15.0	16.5	21.9	11.7	16.7	13.6	9.11	11.5	
Total Strontium (Sr)	mg/L	-	-		0.105	0.202	0.0671	-	0.108	0.063	0.068	0.057	0.09000	0.070	0.064	0.0931	0.0649	0.0468	
Total Sulphur (S)	mg/L	-	-		ND	ND	ND	-	ND	4.00000	<1	<1	1.00000	<1	<3.0	<3.0	<3.0	<3.0	
Total Tellurium (Te)	mg/L	-	-		-	<0.0002	<0.0002	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	
Total Thallium (Tl)	mg/L	0.0017	0.002		ND	ND	ND	-	ND	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000020	<0.000020	<0.000010	<0.000010	
Total Thorium (Th)	mg/L	-	-		-	<0.0001	<0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	
Total Tin (Sn)	mg/L	-	-		ND	ND	ND	-	ND	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00010	<0.00010	
Total Titanium (Ti)	mg/L	2	0.1		ND	0.0156	ND	-	ND	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	0.0231	0.00853	0.00416	
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	-	-	-	-	-	<0.00010	<0.00010	
Total Uranium (U)	mg/L	0.3	20		ND	ND	ND	-	ND	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000020	0.000028	0.000017	0.000018	
Total Vanadium (V)	mg/L	0.006	0.02		ND	ND	ND	-	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0033	0.00142	0.00082	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0056	0.0151	ND	-	0.0112	0.00800	0.00800	0.01000	<0.004	0.00500	0.00510	0.0105	0.0072	0.0117	
Total Zirconium (Zr)	mg/L	-	-		ND	ND	ND	-	ND	0.00030	0.00030	0.00030	<0.0001	0.00020	0.00026	0.00031	0.000228	0.000344	

Field	Units	BC MoE Guidelines (a)			13-Aug-19	21-Nov-19	24-Jun-20	20-Aug-20	DUP	RPD	30-Sep-20	21-Apr-21	20-Jul-21	22-Oct-21	DUP	RPD
		Freshwater Aquatic Life	Drinking Water	CSR DW												
Total Metals																
Total Aluminum	mg/L	0.1	0.2	0.197	0.576	0.204	0.266	0.265	-	0.418	0.180	0.0858	0.276	0.198	32.91%	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	
Total Arsenic (As)	mg/L	0.005	0.025, MAC	0.00142	0.00069	0.00087	0.00108	0.00110	1.83	0.00084	0.00055	0.00089	0.00080	0.00068	16.22%	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.024	0.017	0.0266	0.0231	0.0235	1.72	0.0160	0.00996	0.0184	0.0176	0.0159	10.15%	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.00010	<0.00010	<0.000100	<0.000100	<0.000100	-	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	#VALUE!	
Total Bismuth (Bi)	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	
Total Boron (B)	mg/L	1.2	5.0, MAC	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010	#VALUE!	
Total Cadmium (Cd)	mg/L	0.00018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.0000072	0.000147	0.0000096	0.0000099	0.000130	27.07	0.0000150	0.0000166	0.0000160	0.0000089	0.0000070	23.90%	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	15.1	10.6	13.9	12.4	12.4	0.00	9.25	7.09	14.4	12.7	12.4	2.99%	
Total Cesium (Cs)	mg/L	-	-	0.000016	0.00003	<0.000010	<0.000010	<0.000010	-	0.000015	<0.000010	<0.000010	0.000010	<0.000010	#VALUE!	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.0003	0.00068	0.00039	0.00058	0.00058	0.00	0.00065	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	
Total Cobalt (Co)	mg/L	0.11	-	0.00043	0.00025	0.00038	0.00158	0.00167	5.54	0.00032	0.00016	0.00025	0.00082	0.00030	92.86%	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	0.00084	0.00265	0.00098	0.00086	0.00094	8.89	0.00195	0.00148	<0.00050	0.00120	0.00100	18.18%	
Total Iron (Fe)	mg/L	1	<0.3, AO	1.00	0.91	0.829	1.99	2.16	8.19	1.02	0.405	0.613	1.40	0.931	40.24%	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	0.000231	0.000239	0.000110	0.000298	0.000310	3.95	0.000245	0.000126	0.000074	0.000185	0.000087	72.06%	
Total Lithium (Li)	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	
Total Magnesium (Mg)	mg/L	-	700	3.02	2.51	2.62	2.60	2.64	1.53	2.03	1.62	2.69	2.66	2.66	0.00%	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.105	0.0283	0.0752	0.373	0.407	8.72	0.0510	0.0288	0.0584	0.222	0.0693	104.84%	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	<0.000050	0.000088	<0.000050	<0.000050	<0.000050	-	0.000065	<0.000050	<0.000050	<0.000050	<0.000050	#VALUE!	
Total Molybdenum (Mo)	mg/L	2	0.25	<0.00050	0.000089	<0.000050	0.000444	0.000624	33.71	0.000114	0.000914	<0.000050	0.000057	<0.000050	#VALUE!	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.00093	0.00116	0.00076	0.00122	0.00134	9.38	0.00124	0.00082	0.00075	0.00098	0.00086	13.04%	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	0.052	<0.050	0.058	0.066	0.078	16.67	<0.050	<0.050	<0.050	<0.050	<0.050	#VALUE!	
Total Potassium (K)	mg/L	373-432	-	0.408	0.665	0.077	0.380	0.401	5.38	0.749	0.658	0.136	0.672	0.662	1.50%	
Total Rubidium (Rb)	mg/L	-	-	0.00048	0.0005	<0.00020	0.00041	0.00037	10.26	0.00066	0.00038	<0.00020	0.00049	0.00046	6.32%	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	0.000054	0.000097	0.000074	0.000079	0.000065	19.44	0.000107	0.000075	<0.000050	<0.000050	0.000076	#VALUE!	
Total Silicon (Si)	mg/L	-	-	1	3.99	0.99	2.63	2.69	2.26	3.80	1.18	0.58	2.88	2.83	1.75%	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	<0.000010	0.000014	<0.000010	<0.000010	<0.000010	-	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	
Total Sodium (Na)	mg/L	-	<200, AO	20.9	13.6	24.2	19.9	20.3	1.99	10.3	8.84	18.0	23.1	23.2	0.43%	
Total Strontium (Sr)	mg/L	-	-	0.103	0.068	0.101	0.0826	0.0846	2.39	0.0597	0.0487	0.0955	0.0790	0.0787	0.38%	
Total Sulphur (S)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	
Total Tellurium (Te)	mg/L	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	#VALUE!	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	
Total Thorium (Th)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	
Total Tin (Sn)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	
Total Titanium (Ti)	mg/L	2	0.1	<0.0039	0.00702	0.00144	0.00271	0.00264	2.62	0.00580	0.00140	<0.00120	0.00273	0.00164	49.89%	
Total Tungsten (W)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	
Total Uranium (U)	mg/L	0.3	20	<0.000010	0.000023	0.000010	0.000011	0.000012	8.70	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	
Total Vanadium (V)	mg/L	0.006	0.02	0.00072	0.00117	<0.00050	0.00067	0.00068	1.48	0.00087	<0.00050	<0.00050	0.00056	<0.00050	#VALUE!	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	<0.0030	0.0115	0.0063	0.0096	0.0106	9.90	0.0098	0.0063	0.0069	0.0102	0.0087	15.87%	
Total Zirconium (Zr)	mg/L	-	-	<0.00020	<0.00060	<0.00020	0.00026	0.00027	3.77	0.00038	0.00030	<0.00020	0.00033	0.00024	31.58%	

Field	Units	BC MoE Guidelines (a)												
		Freshwater Aquatic Life	Drinking Water	CSR DW	26-Jul-04	25-May-06	8-Aug-07	10-Jun-08	25-Aug-09	16-Mar-10	22-Jun-10	30-Sep-10	28-Feb-12	14-Aug-12
Volatle Organic Compounds														
Benzene	µg/L				-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-	-	-	-
Volatle Organic Compounds Surrogates														
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	-	-	-
Hydrocarbons														
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates														
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC¹⁰
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC¹⁰
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			SW-5 - E287409													
		Freshwater Aquatic Life	Drinking Water	CSR DW	Beaver Pond Outlet													
					4-Oct-12	27-Mar-13	17-Oct-13	7-Jul-14	25-Nov-14	26-May-15	1-Nov-15	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17	28-May-18	16-Apr-19
Volatle Organic Compounds																		
Benzene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatle Organic Compounds Surrogates																		
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons																		
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C32)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates																		
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC¹
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC¹
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)														
		Freshwater Aquatic Life	Drinking Water	CSR DW	13-Aug-19	21-Nov-19	24-Jun-20	20-Aug-20	DUP	RPD	30-Sep-20	21-Apr-21	20-Jul-21	22-Oct-21	DUP	RPD
Volatile Organic Compounds																
Benzene	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!
Ethylbenzene	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!
Methyl t-butyl ether (MTBE)	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!
Styrene	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!
Toluene	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!
Xylene, m- and p-	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.40	<0.40	<0.40	<0.40	#VALUE!
Xylene, o-	µg/L				-	-	<0.50	<0.50	<0.50	-	<0.50	<0.30	<0.30	<0.30	<0.30	#VALUE!
Xylenes, total	µg/L				-	-	<0.75	<0.75	<0.75	-	<0.75	<0.50	<0.50	<0.50	<0.50	#VALUE!
Volatile Organic Compounds Surrogates																
bromofluorobenzene, 4-	%				-	-	96.4	92.2	92.9	0.76	84.80	109.00	84.9	92.60	94.0	1.50%
difluorobenzene, 1,4-	%				-	-	106	109	110	0.91	95.30	102.00	106	107	95.1	11.78%
Hydrocarbons																
EPH (C10-C19)	µg/L				-	-	<250	<250	<250	-	<250	<250	<250	<250	<250	#VALUE!
EPH (C19-C32)	µg/L				-	-	<250	<250	<250	-	<250	<250	<250	<250	<250	#VALUE!
TEH (C10-C30), BC	µg/L				-	-	<250	<250	<250	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	<100	<100	<100	-	<100	<100	<100	<100	<100	#VALUE!
VPHw	µg/L				-	-	<100	<100	<100	-	<100	<100	<100	<100	<100	#VALUE!
EPH (C10-C32)	µg/L				-	-	-	-	-	-	-	-	-	<400	<400	#VALUE!
Hydrocarbons Surrogates																
bromobenzotrifluoride, 2- (EPH surr)	%				-	-	88.5	130	124	4.72	84.20	92.50	97.0	83.60	92.2	9.78%
dichlorotoluene, 3,4-	%				-	-	118	96.3	92.4	4.13	98.40	77.60	107	112.00	74.5	40.21%

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC¹
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC¹
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)									
		Freshwater Aquatic Life	Drinking Water	CSR DW	26-Jul-04	8-Aug-07	25-Aug-09	16-Mar-10	22-Jun-10	30-Sep-10	28-Feb-12
Dissolved Oxygen	mg/L				-	-	-	-	-	-	-
Conductivity	µS/cm				-	-	-	-	-	-	-
pH	pH units				-	-	-	-	-	-	-
Temperature	°C				-	-	-	-	-	-	-
Turbidity	NTU				-	-	-	-	-	-	-
Flow Rate	m/sec				-	-	-	-	-	-	-
Lab Analyte											
Alkalinity (Total as CaCO3)	mg/L	-	-		132	38	174	14	63	200	10
Conductivity	uS/cm	-	700		1,480	230	2,050	163	421	1,540	118
Dissolved Hardness (CaCO3)	mg/L	-	500		-	-	-	-	-	-	-
Total Hardness	mg/L	-	500 (i)		-	-	-	44	112	307	32
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		7.0	6.4	6.7	5.8	6.2	7.0	5.8
Chemical Oxygen Demand	mg/L	-	-		54	114	246	84	140	71	95
BOD	mg/L	-	-		<6	ND	11	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		5.6	ND	15.0	ND	1.1	22.0	ND
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		405	49	590	39	84	355	27
Total Kjeldahl Nitrogen	mg/L	-	-		1.25	1.92	1.18	0.96	1.97	0.9	0.71
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.05	ND	0.3	ND	0.07	0.07	0.09
Chloride	mg/L				-	-	-	-	-	-	-
Fluoride	mg/L				-	-	-	-	-	-	-
Nitrate (N)	mg/L	200 (max)	10 MAC		-	-	-	-	-	-	-
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		-	-	-	-	-	-	-
Sulfate	mg/L				-	-	-	-	-	-	-
Total Organic Carbon (C)	mg/L	-	4.0		-	-	-	-	-	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-

Field	Units	BC MoE Guidelines (a)			28-May-18	16-Apr-19	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20	22-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW									
Dissolved Metals													
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	-	-	0.807	0.110	0.322	0.285	0.213	-	0.134
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025 MAC	0.01 ⁽²⁾	-	-	0.00057	0.00049	0.00093	0.00076	0.00063	-	0.00034
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	-	-	0.0173	0.0204	0.0194	0.0148	0.00998	-	0.0141
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	-	-	<0.00010	<0.000100	<0.000100	<0.000100	<0.000100	-	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	-	-	0.026	0.039	0.030	0.019	<0.010	-	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	-	-	0.000098	<0.000050	0.0000104	0.0000097	0.0000111	-	0.0000054
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	-	-	10.5	19.1	15.6	11.9	8.29	-	10.4
Dissolved Cesium (Cs)					-	-	0.000029	<0.000010	0.000026	<0.000010	<0.000010	-	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	-	-	0.00085	0.00027	0.00050	0.00047	<0.00050	-	<0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	-	-	0.00021	0.00021	0.00027	0.00018	0.00015	-	<0.00010
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	-	-	0.00304	0.00127	0.00171	0.00191	0.00135	-	0.00166
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	-	-	0.563	0.141	0.780	0.507	0.565	-	0.165
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	-	-	0.000122	<0.000050	0.000078	0.000077	0.000070	-	<0.000050
Dissolved Lithium (Li)	mg/L			0.008 ⁽²⁾	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Dissolved Magnesium (Mg)	mg/L	-	700	-	-	-	2.78	4.49	3.36	2.68	1.77	-	2.06
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	-	-	0.00832	0.0727	0.0458	0.0315	0.0289	-	0.00302
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	-	-	0.000097	<0.000050	<0.000050	0.0000151	<0.000050	-	<0.000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	-	-	0.000084	0.000069	0.000226	0.000136	0.000901	-	<0.000050
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	-	-	0.00111	0.00107	0.00157	0.00120	0.00069	-	0.00060
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050
Dissolved Potassium (K)	mg/L	373-432	-	-	-	-	0.908	1.18	1.15	1.16	0.752	-	0.520
Dissolved Rubidium (Rb)					-	-	0.00056	0.00046	0.00074	0.00049	0.00047	-	0.00022
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	-	-	0.000097	0.000123	0.000149	0.000119	0.000062	-	0.000080
Dissolved Silicon (Si)	mg/L	-	-	-	-	-	4.43	3.97	4.23	4.06	1.80	-	2.97
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	-	-	0.000016	<0.000010	0.000013	<0.000010	<0.000010	-	<0.000010
Dissolved Sodium (Na)	mg/L		<200, AO	200 ⁽²⁾	-	-	11.2	17.4	16.7	7.20	8.54	-	19.6
Dissolved Strontium (Sr)	mg/L	-	-	-	-	-	0.0682	0.123	0.104	0.0775	0.0514	-	0.0696
Dissolved Sulphur (S)	mg/L	-	-	-	-	-	1.1	<0.50	<0.50	<0.50	<0.50	-	<0.50
Dissolved Tellurium (Te)					-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010
Dissolved Thorium (Th)					-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	-	-	0.0158	0.00110	0.00535	0.00280	0.00283	-	0.00088
Dissolved Tungsten (W)				0.003 ⁽²⁾	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	-	-	0.000039	0.000014	0.000028	0.000023	0.000014	-	<0.000010
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	-	-	0.00135	<0.00050	0.00114	0.00056	0.00059	-	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	-	-	0.0026	0.0015	0.0027	0.0053	0.0024	-	<0.0010
Dissolved Zirconium (Zr)	mg/L	-	-	-	-	-	0.00133	0.00034	0.00113	<0.00060	0.00039	-	0.00024

Field	Units	BC MoE Guidelines (a)			26-Jul-04	8-Aug-07	25-Aug-09	16-Mar-10	22-Jun-10	30-Sep-10	28-Feb-12
		Freshwater Aquatic Life	Drinking Water	CSR DW							
Total Metals											
Total Aluminum	mg/L	0.1	0.2	0.060	0.850	3.84	0.27	0.38	0.58	0.25	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	<0.05	ND	0.0009	ND	0.00015	ND	ND	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	<0.05	ND	0.0391	0.0005	0.00191	0.0023	0.00058	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.129	0.052	0.695	0.017	0.055	0.173	0.011	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.0002	ND	0.0001	ND	0.00003	ND	ND	
Total Bismuth (Bi)	mg/L	-	-	<0.05	ND	ND	ND	0.000011	ND	ND	
Total Boron (B)	mg/L	1.2	5.0, MAC	0.01	ND	ND	ND	ND	ND	ND	
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	<0.002	0.002	0.00041	0.00019	0.000212	0.00008	0.00052	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	77.6	21.9	130	12	34.3	98	9	
Total Cesium (Cs)	mg/L	-	-	-	-	-	-	-	-	-	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	<0.005	ND	0.005	ND	0.0015	0.002	0.0007	
Total Cobalt (Co)	mg/L	0.11	-	<0.005	0.007	0.0233	0.0005	0.00707	0.0015	0.00049	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	<0.005	0.006	0.0156	0.0023	0.00512	0.0045	0.0021	
Total Iron (Fe)	mg/L	1	<0.3, AO	1.37	10.90	180.00	0.58	4.20	17.00	1.12	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	<0.03	ND	0.0119	0.0003	0.00092	0.0011	0.00053	
Total Lithium (Li)	mg/L	-	-	ND	ND	ND	ND	ND	ND	ND	
Total Magnesium (Mg)	mg/L	-	700	11.1	4.1	16.3	3.29	6.48	15.1	2.4	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.421	1.78	4.49	0.218	2.47	0.648	0.143	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	<0.00005	ND	ND	ND	ND	ND	0.0000021	
Total Molybdenum (Mo)	mg/L	2	0.25	<0.005	ND	0.002	ND	0.00022	ND	0.00085	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	<0.008	ND	0.006	0.001	0.00266	0.002	0.0008	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	<0.1	0.1	ND	ND	ND	ND	ND	
Total Potassium (K)	mg/L	373-432	-	2.00	ND	1.94	1.24	0.55	2.34	ND	
Total Rubidium (Rb)	mg/L	-	-	-	-	-	-	-	-	-	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	<0.03	ND	0.0001	ND	0.00009	ND	0.00006	
Total Silicon (Si)	mg/L	-	-	<0.01	4.63	11.8	3.16	3.27	4.7	3.78	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	221	ND	0.07	ND	0.000006	0.00002	0.000006	
Total Sodium (Na)	mg/L	-	<200, AO	0.444	25.4	253	15.3	44.1	176	11.2	
Total Strontium (Sr)	mg/L	-	-	2.4	0.136	0.767	0.075	0.207	0.624	0.0556	
Total Sulphur (S)	mg/L	-	-	<0.05	0.9	9.0	3.0	ND	5.0	ND	
Total Tellurium (Te)	mg/L	-	-	-	-	-	-	-	-	-	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.03	ND	ND	ND	0.000003	ND	0.000003	
Total Thorium (Th)	mg/L	-	-	-	-	-	-	-	-	-	
Total Tin (Sn)	mg/L	-	-	<0.02	ND	ND	ND	0.00002	ND	ND	
Total Titanium (Ti)	mg/L	2	0.1	<0.003	0.009	0.081	ND	0.0055	0.007	ND	
Total Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	
Total Uranium (U)	mg/L	0.3	20	ND	ND	0.0003	ND	0.00007	0.0002	0.000009	
Total Vanadium (V)	mg/L	0.006	0.02	<0.005	0.006	0.025	ND	0.0022	ND	0.0007	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	<0.005	0.038	0.186	0.013	0.0148	0.028	0.005	
Total Zirconium (Zr)	mg/L	-	-	<0.005	ND	0.0006	ND	0.0005	ND	0.0002	

Field	Units	BC MoE Guidelines (a)			SW-7 - E287410 Beaver Pond Stream								
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Aug-12	4-Oct-12	27-Mar-13	17-Oct-13	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17
Total Metals													
Total Aluminum	mg/L	0.1	0.2		0.94	0.18	1.32	1.27	0.64	1.10	0.58	0.32	0.328
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		ND	ND	ND	ND	0.0001	0.0001	0.0003	<0.00010	0.0001
Total Arsenic (As)	mg/L	0.005	0.025 MAC		0.00748	0.00037	0.0013	0.00341	0.0006	0.0015	0.0007	<0.00050	0.00054
Total Barium (Ba)	mg/L	5	1.0, MAC		0.173	0.009	0.035	0.033	0.019	0.035	0.018	0.014	0.015
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		ND	ND	ND	ND	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Total Bismuth (Bi)	mg/L	-	-		ND	ND	ND	ND	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Total Boron (B)	mg/L	1.2	5.0, MAC		ND	ND	ND	ND	0.028	0.014	0.039	0.026	0.048
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.000296	0.000021	0.000077	0.000066	0.00011	0.00005	0.00005	0.000011	<0.000010
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		53.6	5.61	18.7	14.7	11.9	22.6	11.1	10.6	12
Total Cesium (Cs)	mg/L	-	-		-	-	-	-	-	-	-	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.0015	ND	0.002	0.0019	0.0009	0.0013	0.0009	0.00055	0.00055
Total Cobalt (Co)	mg/L	0.11	-		0.00651	ND	0.00188	0.00196	0.00024	0.00125	0.00025	0.00017	0.00017
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00464	0.00128	0.00914	0.00289	0.0058	0.003	0.004	0.00237	0.00207
Total Iron (Fe)	mg/L	1	<0.3, AO		15.70	0.49	2.84	8.57	0.57	2.17	0.60	0.34	0.27
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.00191	0.00026	0.00202	0.00213	0.0008	0.0015	0.0002	0.00012	<0.00010
Total Lithium (Li)	mg/L	-	-		ND	ND	ND	ND	0.0003	0.0007	0.0003	0.00016	0.00013
Total Magnesium (Mg)	mg/L	-	700		7.47	1.32	4.3	3.34	2.88	4.18	2.86	2.72	2.94
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		5.16	0.0465	0.433	0.344	0.0177	0.329	0.0264	0.0231	0.0293
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		ND	ND	ND	ND	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Molybdenum (Mo)	mg/L	2	0.25		ND	ND	ND	ND	<0.0001	0.0002	0.0002	0.00012	<0.00010
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.0023	ND	0.0023	0.002	0.0016	0.002	0.0015	0.00109	0.00107
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.23	0.03	0.08	0.15	0.02	0.09	0.03	<0.050	<0.050
Total Potassium (K)	mg/L	373-432	-		1.36	0.302	0.962	0.53	1.06	1.09	0.74	1.37	1.19
Total Rubidium (Rb)	mg/L	-	-		-	-	-	-	-	-	-	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		ND	ND	ND	0.00016	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Total Silicon (Si)	mg/L	-	-		5.2	1.29	5.15	4.61	3.9	5.7	4.1	3	3.8
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000027	ND	0.000022	ND	<0.00005	<0.00005	<0.00005	<0.000050	<0.000050
Total Sodium (Na)	mg/L	-	<200, AO		134	8.68	32.4	15.9	16	34	11	14.3	8.58
Total Strontium (Sr)	mg/L	-	-		0.352	0.041	0.122	0.0924	0.072	0.115	0.082	0.0687	0.0766
Total Sulphur (S)	mg/L	-	-		ND	ND	ND	ND	<1	2.0	<1	<3.0	<3.0
Total Tellurium (Te)	mg/L	-	-		-	-	-	-	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020
Total Thallium (Tl)	mg/L	0.0017	0.002		ND	ND	ND	ND	<0.00002	<0.00002	<0.00002	<0.000020	<0.000020
Total Thorium (Th)	mg/L	-	-		-	-	-	-	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010
Total Tin (Sn)	mg/L	-	-		ND	ND	ND	ND	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020
Total Titanium (Ti)	mg/L	2	0.1		0.0121	ND	0.0266	0.019	0.007	0.016	0.006	0.0055	<0.0050
Total Tungsten (W)	mg/L	-	-		-	-	-	-	-	-	-	-	-
Total Uranium (U)	mg/L	0.3	20		ND	ND	ND	ND	0.00003	0.00004	0.00003	0.000024	0.000026
Total Vanadium (V)	mg/L	0.006	0.02		ND	ND	ND	ND	0.001	0.002	<0.001	<0.0010	<0.0010
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.033	ND	0.0243	0.0181	0.01	0.007	<0.004	<0.0040	<0.0040
Total Zirconium (Zr)	mg/L	-	-		ND	ND	ND	ND	0.0007	0.0006	0.0004	0.00046	0.00053

Field	Units	BC MoE Guidelines (a)			28-May-18	16-Apr-19	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20	22-Apr-21	20-Jul-21	22-Oct-21
		Freshwater Aquatic Life	Drinking Water	CSR DW									
Total Metals													
Total Aluminum	mg/L	0.1	0.2	0.620	0.567	1.14	0.695	0.642	0.697	0.200	-	0.150	
Total Antimony (Ab)	mg/L	0.02	0.006, MAC	0.0001	0.00011	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Arsenic (As)	mg/L	0.005	0.025 MAC	0.0009	0.00048	0.00072	0.00087	0.00092	0.00100	0.00059	-	0.00039	
Total Barium (Ba)	mg/L	5	1.0, MAC	0.022	0.0153	0.0206	0.0304	0.0187	0.0188	0.0101	-	0.0142	
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004	<0.00010	<0.00010	<0.00010	<0.000100	<0.000100	<0.000100	<0.000100	-	<0.000100	
Total Bismuth (Bi)	mg/L	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	
Total Boron (B)	mg/L	1.2	5.0, MAC	0.024	0.026	0.038	0.041	0.029	0.021	<0.010	-	<0.010	
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC	0.0000151	0.0000158	0.0000286	0.0000298	0.0000162	0.0000128	0.0000096	-	0.0000101	
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	14.5	9.37	11.7	18.7	14.9	12.2	8.06	-	10.1	
Total Cesium (Cs)	mg/L	-	-	0.000053	0.000036	0.00008	0.000041	0.000014	0.000043	<0.000010	-	<0.000010	
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.00076	0.00064	0.00112	0.00080	0.00051	0.00086	<0.00050	-	<0.00050	
Total Cobalt (Co)	mg/L	0.11	-	0.00067	0.00019	0.00036	0.00096	0.00029	0.00035	0.00019	-	<0.00010	
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5	0.00233	0.00262	0.00384	0.00233	0.00174	0.00251	0.00159	-	0.00163	
Total Iron (Fe)	mg/L	1	<0.3, AO	0.84	0.444	1.04	1.18	0.780	1.01	0.610	-	0.207	
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC	0.000278	0.000104	0.000252	0.000832	0.000121	0.000171	0.000102	-	<0.000050	
Total Lithium (Li)	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	
Total Magnesium (Mg)	mg/L	-	700	3.71	2.21	2.9	4.85	3.82	2.75	1.74	-	2.20	
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	0.222	0.0075	0.0153	0.290	0.0765	0.0658	0.0390	-	0.00435	
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	<0.0000050	0.0000084	0.0000124	<0.0000050	<0.0000050	0.0000181	<0.0000050	-	0.0000059	
Total Molybdenum (Mo)	mg/L	2	0.25	0.000103	0.000083	0.000114	0.000154	0.000208	0.000173	0.000078	-	<0.000050	
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.00167	0.00119	0.00199	0.00156	0.00159	0.00172	0.00083	-	0.00061	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	<0.050	<0.050	0.054	0.066	<0.050	<0.050	<0.050	-	<0.050	
Total Potassium (K)	mg/L	373-432	-	1.1	1.02	0.9	1.26	1.10	1.16	0.696	-	0.523	
Total Rubidium (Rb)	mg/L	-	-	0.00072	0.00054	0.00087	0.00082	0.00070	0.00084	0.00039	-	0.00025	
Total Selenium (Se)	mg/L	0.002	0.01, MAC	0.000098	0.000093	0.000108	0.000094	0.000076	0.000120	0.000067	-	<0.000050	
Total Silicon (Si)	mg/L	-	-	4.6	3.91	5.19	4.34	3.66	4.78	1.77	-	3.05	
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)	<0.000020	0.000011	0.000028	0.000010	<0.000010	0.000023	<0.000010	-	<0.000010	
Total Sodium (Na)	mg/L	-	<200, AO	11.6	12.3	11.1	17.4	17.7	7.03	8.75	-	20.3	
Total Strontium (Sr)	mg/L	-	-	0.0953	0.0585	0.0724	0.125	0.0971	0.0760	0.0553	-	0.0652	
Total Sulphur (S)	mg/L	-	-	<0.50	<0.50	1.01	<0.50	<0.50	<0.50	<0.50	-	<0.50	
Total Tellurium (Te)	mg/L	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	
Total Thallium (Tl)	mg/L	0.0017	0.002	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	
Total Thorium (Th)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Tin (Sn)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Titanium (Ti)	mg/L	2	0.1	0.0104	0.00731	0.0129	0.00972	0.00975	0.00747	0.00166	-	0.00118	
Total Tungsten (W)	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	
Total Uranium (U)	mg/L	0.3	20	0.000025	0.000026	0.000042	0.000034	0.000023	0.000029	0.000014	-	0.000011	
Total Vanadium (V)	mg/L	0.006	0.02	0.00136	0.00094	0.00181	0.00159	0.00078	0.00132	0.00063	-	<0.00050	
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO	0.01	<0.0030	0.0049	0.0070	0.0035	0.0070	<0.0030	-	<0.0030	
Total Zirconium (Zr)	mg/L	-	-	0.000382	<0.00066	0.0006	0.00028	0.00039	0.00050	0.00033	-	0.00026	

Field	Units	BC MoE Guidelines (a)			26-Jul-04	8-Aug-07	25-Aug-09	16-Mar-10	22-Jun-10	30-Sep-10	28-Feb-12
		Freshwater Aquatic Life	Drinking Water	CSR DW							
Volatile Organic Compounds											
Benzene	µg/L				-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates											
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-
Hydrocarbons											
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-
Hydrocarbons Surrogates											
bromobenzotrifluoride, 2- (EPI)	%				-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h.copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h.copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			SW-7 - E287410 Beaver Pond Stream								
		Freshwater Aquatic Life	Drinking Water	CSR DW	14-Aug-12	4-Oct-12	27-Mar-13	17-Oct-13	16-Apr-16	7-Jul-16	25-Oct-16	24-Apr-17	14-Jun-17
Volatile Organic Compounds													
Benzene	µg/L				-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L				-	-	-	-	-	-	-	-	-
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	-	-	-	-	-	-
Styrene	µg/L				-	-	-	-	-	-	-	-	-
Toluene	µg/L				-	-	-	-	-	-	-	-	-
Xylene, m- and p-	µg/L				-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L				-	-	-	-	-	-	-	-	-
Xylenes, total	µg/L				-	-	-	-	-	-	-	-	-
Volatile Organic Compounds Surrogates													
bromofluorobenzene, 4-	%				-	-	-	-	-	-	-	-	-
difluorobenzene, 1,4-	%				-	-	-	-	-	-	-	-	-
Hydrocarbons													
EPH (C10-C19)	µg/L				-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	-
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	-	-	-	-	-	-
VPHw	µg/L				-	-	-	-	-	-	-	-	-
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	-
Hydrocarbons Surrogates													
bromobenzotrifluoride, 2- (EPI)	%				-	-	-	-	-	-	-	-	-
dichlorotoluene, 3,4-	%				-	-	-	-	-	-	-	-	-

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependant on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h.copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

A compendium of Working Water Quality Guidelines for BC"

b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)

c. Limit dependant on chloride concentration. (MAC - Maximum Acceptable Concentration)

d. Limit pH and temperature dependent.

e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.

f. Limit for chromium (IV)

g. Limit for total, no dissolved concentrations

h.copper (mg/L) = (0.094* Hardness)/1000

i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)											
		Freshwater Aquatic Life	Drinking Water	CSR DW	28-May-18	16-Apr-19	21-Nov-19	24-Jun-20	20-Aug-20	30-Sep-20	22-Apr-21	20-Jul-21	22-Oct-21
Volatile Organic Compounds													
Benzene	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Ethylbenzene	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Methyl t-butyl ether (MTBE)	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Styrene	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Toluene	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.50	-	<0.50
Xylene, m- and p-	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.40	-	<0.40
Xylene, o-	µg/L				-	-	-	<0.50	<0.50	<0.50	<0.30	-	<0.30
Xylenes, total	µg/L				-	-	-	<0.75	<0.75	<0.75	<0.50	-	<0.50
Volatile Organic Compounds Surrogates													
bromofluorobenzene, 4-	%				-	-	-	94.8	93.3	80.6	109	-	87.3
difluorobenzene, 1,4-	%				-	-	-	104	107	97.8	102	-	109
Hydrocarbons													
EPH (C10-C19)	µg/L				-	-	-	<250	<250	<250	<250	-	<250
EPH (C19-C32)	µg/L				-	-	-	<250	<250	<250	<250	-	<250
TEH (C10-C30), BC	µg/L				-	-	-	<250	<250	-	-	-	-
VHw (C6-C10)	µg/L				-	-	-	<100	<100	<100	<100	-	<100
VPHw	µg/L				-	-	-	<100	<100	<100	<100	-	<100
EPH (C19-C32)	µg/L				-	-	-	-	-	-	-	-	<400
Hydrocarbons Surrogates													
bromobenzotrifluoride, 2- (EPI)	%				-	-	-	92.6	112	86.7	72.3	-	82.1
dichlorotoluene, 3,4-	%				-	-	-	109	86.1	66.5	72.6	-	110

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h. copper (mg/L) = (0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			24-Jun-20	DUP	RPD	20-Aug-2020
		Freshwater Aquatic Life	Drinking Water	CSR DW				
Dissolved Oxygen	mg/L				2.5	-	-	3.2
Conductivity	µS/cm				183.5	-	-	130
pH	pH units				6.13	-	-	6.31
Temperature	°C				14.8	-	-	13.8
Turbidity	NTU				-	-	-	2.88
Flow Rate	m/sec				-	-	-	0.05
Lab Analyte								
Alkalinity (Total as CaCO3)	mg/L	-	-		32.6	30.7	6.00	35.7
Conductivity	uS/cm	-	700		231	233	0.86	166
Dissolved Hardness (CaCO3)	mg/L	-	500		56.4	57.6	2.11	45.9
Total Hardness	mg/L	-	500 (i)		64.9	71.2	9.26	46.8
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		6.74	6.83	1.33	6.91
Chemical Oxygen Demand	mg/L	-	-		102	111	8.45	103
BOD	mg/L	-	-		-	-	-	-
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-		1.25	1.5	18.18	1.19
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0298	0.0352	16.62	0.0242
Chloride	mg/L				47.3	47.3	0.00	27.2
Fluoride	mg/L				0.032	0.032	0.00	0.048
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0010	0.0102	-	0.0124
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.0050	0.0019	-	<0.0010
Sulfate	mg/L				<0.30	<0.30	-	<0.30
Total Organic Carbon (C)	mg/L	-	4.0		37.5	40.3	7.20	34.2
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-
Dissolved Metals								
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.134	0.133	0.75	0.215
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00010	<0.00010	-	<0.00010
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	0.00188	0.00176	6.59	0.00136
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0239	0.0242	1.25	0.0166
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	<0.000100	-	<0.000100
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	-	<0.000050
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	<0.010	-	<0.010
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.000011	0.0000193	54.79	0.0000239
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	16.7	17.4	4.11	13.9
Dissolved Cesium (Cs)	mg/L				<0.000010	<0.000010	-	<0.000010
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.0004	0.00045	6.90	0.00050
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00118	0.00121	2.51	0.00046
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00091	0.00073	21.95	0.00110
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	1.94	1.92	1.04	1.53
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.0	0.000074	6.54	0.000115
Dissolved Lithium (Li)	mg/L				0.008 ⁽²⁾	<0.0010	-	<0.0010
Dissolved Magnesium (Mg)	mg/L	-	700		3.54	3.43	3.16	2.69
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.549	0.565	2.87	0.0929
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	<0.0000050	<0.0000050	-	<0.0000050
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000117	0.000114	2.60	0.000156
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00132	0.00127	3.86	0.00131
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.1	0.072	0.00	0.059

Table 1. Hazelton Surface Water Quality Data

Field	Units	BC MoE Guidelines (a)			SW-09 - E310968							
		Freshwater Aquatic Life	Drinking Water	CSR DW	30-Sep-20	21-Apr-21	20-Jul-21	26-Oct-21	DUP	RPD	18-Jan-22	
Dissolved Oxygen	mg/L				4.5	6.6	6.6	9.3	-	-	Frozen	
Conductivity	µS/cm				69.5	443.7	531	382.8	-	-	No Flow	
pH	pH units				6.1	7.82	9.29	7.86	-	-	-	
Temperature	°C				10.4	10.1	14.5	5.9	-	-	-	
Turbidity	NTU				3.8	2.38	1.37	0.32	-	-	-	
Flow Rate	m/sec				0.22	0.025	-	0.1	-	-	-	
Lab Analyte												
Alkalinity (Total as CaCO3)	mg/L	-	-		20.20	273.00	275.00	257.00	257.00	0.00%	-	
Conductivity	uS/cm	-	700		96.4	629	669	600	600	0.00%	-	
Dissolved Hardness (CaCO3)	mg/L	-	500		33.4	240	236	227	231	1.75%	-	
Total Hardness	mg/L	-	500 (i)		33.80	237.00	254.00	223.00	223.00	0.00%	-	
pH	pH Units	6.5 - 9.0	6.5 - 8.5, AC		7.09	8.09	8.16	8.35	8.36	0.12%	-	
Chemical Oxygen Demand	mg/L	-	-		102	26	50	41	32	24.66%	-	
BOD	mg/L	-	-		-	-	-	-	-	#VALUE!	-	
Dissolved Sulphate (SO4)	mg/L	100 (max)	<500, AO		-	-	-	-	-	#VALUE!	-	
Dissolved Chloride (Cl)	mg/L	600, MAC	<250, AO		-	-	-	-	-	#VALUE!	-	
Total Kjeldahl Nitrogen	mg/L	-	-		1.02	1.11	0.822	0.517	0.521	0.77%	-	
Ammonia (N)	mg/L	0.68-27.7 (d)	no guideline		0.0270	0.472	0.0142	0.0076	0.0119	44.10%	-	
Chloride	mg/L	-	-		13.9	38.1	57.8	45.8	45.8	0.00%	-	
Fluoride	mg/L	-	-		0.040	0.092	<0.100	0.091	0.088	3.35%	-	
Nitrate (N)	mg/L	200 (max)	10 MAC		<0.0050	1.32	0.27	0.103	0.0943	8.82%	-	
Nitrite (N)	mg/L	0.06 -0.6 (max) (c)	1.0 MAC		<0.0010	0.0502	<0.0050	<0.0010	0.001	#VALUE!	-	
Sulfate	mg/L	-	-		<0.30	8.02	2.62	7.11	7.08	0.42%	-	
Total Organic Carbon (C)	mg/L	-	4.0		40.0	12.2	15.7	11.8	11.6	1.71%	-	
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		-	-	-	-	-	-	-	
Dissolved Metals												
Dissolved Aluminum (Al)	mg/L	0.1	0.2	9.5 ⁽²⁾	0.472	0.0268	0.0181	0.0081	0.0072	11.76%	-	
Dissolved Antimony (Sb)	mg/L	0.02	0.006, MAC	0.006 ⁽²⁾	<0.00010	0.00013	0.00014	<0.00010	<0.00010	#VALUE!	-	
Dissolved Arsenic (As)	mg/L	0.005	0.025, MAC	0.01 ⁽²⁾	0.00097	0.00066	0.00109	0.00061	0.00061	0.00%	-	
Dissolved Barium (Ba)	mg/L	5	1.0, MAC	1.0 ⁽²⁾	0.0158	0.0462	0.0432	0.0435	0.0422	3.03%	-	
Dissolved Beryllium (Be)	mg/L	0.0053 (g)	0.004	0.008 ⁽²⁾	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	#VALUE!	-	
Dissolved Bismuth (Bi)	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	#VALUE!	-	
Dissolved Boron (B)	mg/L	1.20	5.0, MAC	5.0 ⁽²⁾	<0.010	0.289	0.408	0.267	0.274	2.59%	-	
Dissolved Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	5, MAC	0.005 ⁽²⁾	0.000098	0.0000075	0.0000452	<0.0000050	<0.0000050	#VALUE!	-	
Dissolved Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-	-	10.1	70.9	68.2	62.8	65.8	4.67%	-	
Dissolved Cesium (Cs)	mg/L	-	-	-	<0.000010	0.000017	<0.000010	<0.000010	<0.000010	#VALUE!	-	
Dissolved Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC	0.05 - 6.0 ⁽²⁾	0.00069	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	-	
Dissolved Cobalt (Co)	mg/L	0.11	-	0.001 ⁽²⁾	0.00020	0.00029	0.00015	0.00010	0.00010	0.00%	-	
Dissolved Copper (Cu)	mg/L	0.007-0.05 (e)	0.5	1.5 ⁽²⁾ AO	0.00191	0.00165	0.00078	0.00054	0.00054	0.00%	-	
Dissolved Iron (Fe)	mg/L	0.35	<0.3, AO	6.5 ⁽²⁾	0.910	0.040	0.016	0.012	0.012	0.00%	-	
Dissolved Lead (Pb)	mg/L	0.034-1.53 (Hardness 300-1,000 mg/L) (e)	50, MAC	0.01 ⁽²⁾	0.000126	<0.000050	<0.000050	<0.000050	<0.000050	#VALUE!	-	
Dissolved Lithium (Li)	mg/L	-	-	0.008 ⁽²⁾	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	-	
Dissolved Magnesium (Mg)	mg/L	-	700	-	2.01	15.3	16.1	17.0	16.2	4.82%	-	
Dissolved Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO	1.5 ⁽²⁾	0.0209	0.0124	0.00348	0.00666	0.00537	21.45%	-	
Dissolved Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC	0.001 ⁽²⁾	0.0000223	<0.0000050	<0.0000050	<0.0000050	<0.0000050	#VALUE!	-	
Dissolved Molybdenum (Mo)	mg/L	2	0.25	0.25 ⁽²⁾	0.000141	0.000627	0.00100	0.000405	0.000382	5.84%	-	
Dissolved Nickel (Ni)	mg/L	0.025-0.15 (e)	-	0.08 ⁽²⁾	0.00124	0.00262	0.00329	0.00241	0.00240	0.42%	-	
Dissolved Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01	-	0.063	<0.050	0.065	<0.050	<0.050	#VALUE!	-	

Field	Units	BC MoE Guidelines (a)			24-Jun-20	DUP	RPD	20-Aug-2020
		Freshwater Aquatic Life	Drinking Water	CSR DW				
Dissolved Potassium (K)	mg/L	373-432	-	-	0.661	0.661	0.00	0.655
Dissolved Rubidium (Rb)					0.00057	0.00053	7.27	0.00061
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.00	0.000131	21.10	0.000093
Dissolved Silicon (Si)	mg/L	-	-	-	1.73	1.84	6.16	2.92
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	-	<0.000010
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	24.20	24.0	0.83	19.3
Dissolved Strontium (Sr)	mg/L	-	-	-	0.12	0.119	0.84	0.0952
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	<0.50	-	<0.50
Dissolved Tellurium (Te)					<0.00020	<0.00020	-	<0.00020
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	-	<0.000010
Dissolved Thorium (Th)					<0.00010	<0.00010	-	<0.00010
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	-	<0.00010
Dissolved Titanium (Ti)	mg/L	2	-	-	0.00	0.00177	8.13	0.00294
Dissolved Tungsten (W)					0.003 ⁽²⁾	<0.00010	-	<0.00010
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.00	<0.000010	-	0.000012
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	<0.00050	<0.00050	-	<0.00050
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.01	0.0098	0.00	0.0104
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00036	0.00031	14.93	0.00042
Total Metals								
Total Aluminum	mg/L	0.1	0.2		0.43	0.648	40.89	0.185
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		<0.00010	<0.00010	-	<0.00010
Total Arsenic (As)	mg/L	0.005	0.025, MAC		0.00462	0.00269	52.80	0.00146
Total Barium (Ba)	mg/L	5	1.0, MAC		0.048	0.136	95.65	0.0174
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.000100	<0.000100	-	<0.000100
Total Bismuth (Bi)	mg/L	-	-		<0.000050	<0.000050	-	<0.000050
Total Boron (B)	mg/L	1.2	5.0, MAC		<0.010	<0.010	-	<0.010
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.0000624	0.000254	121.11	0.0000093
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		19.5	22.0	12.05	13.9
Total Cesium (Cs)	mg/L	-	-		0.000022	<0.000010	-	<0.000010
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.0007	0.00077	9.52	0.00052
Total Cobalt (Co)	mg/L	0.11	-		0.00769	0.0188	83.88	0.00058
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00152	0.00253	49.88	0.00088
Total Iron (Fe)	mg/L	1	<0.3, AO		8.07	17.2	72.26	1.91
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.000408	0.000372	9.23	0.000155
Total Lithium (Li)	mg/L	-	-		<0.0010	<0.0010	-	<0.0010
Total Magnesium (Mg)	mg/L	-	700		3.92	3.94	0.51	2.92
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		3.33	7.73	79.57	0.131
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		<0.0000050	<0.0000050	-	<0.0000050
Total Molybdenum (Mo)	mg/L	2	0.25		0.00022	0.000117	61.13	0.000170
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.00174	0.00287	49.02	0.00132
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		0.25	0.185	29.89	0.056
Total Potassium (K)	mg/L	373-432	-		0.752	0.881	15.80	0.581
Total Rubidium (Rb)	mg/L	-	-		0.0007	0.00074	5.56	0.00048
Total Selenium (Se)	mg/L	0.002	0.01, MAC		0.000115	0.000063	58.43	0.000082
Total Silicon (Si)	mg/L	-	-		1.89	1.77	6.56	2.71
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000015	<0.000010	-	<0.000010
Total Sodium (Na)	mg/L	-	<200, AO		25.3	25.3	0.00	19.1
Total Strontium (Sr)	mg/L	-	-		0.134	0.159	17.06	0.0870
Total Sulphur (S)	mg/L	-	-		<0.50	<0.50	-	<0.50
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	-	<0.00020
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.000010	<0.000010	-	<0.000010
Total Thorium (Th)	mg/L	-	-		<0.00010	<0.00010	-	<0.00010
Total Tin (Sn)	mg/L	-	-		<0.00010	<0.00010	-	<0.00010
Total Titanium (Ti)	mg/L	2	0.1		0.00524	0.00660	22.97	0.00237
Total Tungsten (W)	mg/L	-	-		<0.00010	<0.00010	-	<0.00010
Total Uranium (U)	mg/L	0.3	20		0.000021	0.000042	66.67	0.000014
Total Vanadium (V)	mg/L	0.006	0.02		0.0019	0.00222	15.53	0.00058
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0228	0.0650	96.13	0.0088
Total Zirconium (Zr)	mg/L	-	-		0.00029	0.00040	31.88	0.00026

	Units	BC MoE Guidelines (a)			SW-09 - E310968							
		Freshwater Aquatic Life	Drinking Water	CSR DW	30-Sep-20	21-Apr-21	20-Jul-21	26-Oct-21	DUP	RPD	18-Jan-22	
Field												
Dissolved Potassium (K)	mg/L	373-432	-	-	0.936	7.57	8.08	6.32	6.34	0.32%	-	-
Dissolved Rubidium (Rb)					0.00071	0.00132	0.00149	0.00087	0.00086	1.16%	-	-
Dissolved Selenium (Se)	mg/L	0.002	0.01, MAC	0.01 ⁽²⁾	0.000128	0.000071	0.000095	0.000548	0.000290	61.58%	-	-
Dissolved Silicon (Si)	mg/L	-	-	-	3.72	3.31	4.64	2.95	2.96	0.34%	-	-
Dissolved Silver (Ag)	mg/L	0.001-0.003 (e)	0.0001 (g)	0.02 ⁽²⁾	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	-	-
Dissolved Sodium (Na)	mg/L	-	<200, AO	200 ⁽²⁾	9.13	34.3	46.0	39.2	38.4	2.06%	-	-
Dissolved Strontium (Sr)	mg/L	-	-	-	0.0684	0.457	0.496	0.410	0.419	2.17%	-	-
Dissolved Sulphur (S)	mg/L	-	-	-	<0.50	2.62	1.53	2.66	2.42	9.45%	-	-
Dissolved Tellurium (Te)					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	#VALUE!	-	-
Dissolved Thallium (Tl)	mg/L	0.0017	2	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	-	-
Dissolved Thorium (Th)					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Dissolved Tin (Sn)	mg/L	-	-	2.5 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Dissolved Titanium (Ti)	mg/L	2	-	-	0.0132	0.00051	<0.00030	<0.00030	<0.00030	#VALUE!	-	-
Dissolved Tungsten (W)				0.003 ⁽²⁾	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Dissolved Uranium (U)	mg/L	0.3	20	0.020	0.000019	0.000401	0.000554	0.000376	0.000367	2.42%	-	-
Dissolved Vanadium (V)	mg/L	0.006	0.02	0.020 ⁽²⁾	0.00082	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	-	-
Dissolved Zinc (Zn)	mg/L	0.19-0.72 (Hardness 300-1,000 mg/L) (e)	5 AO	3.0 ⁽²⁾	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	-	-
Dissolved Zirconium (Zr)	mg/L	-	-	-	0.00055	<0.00020	<0.00020	0.00024	<0.00020	#VALUE!	-	-
Total Metals												
Total Aluminum	mg/L	0.1	0.2		0.461	0.232	0.0588	0.0184	0.0144	24.39%	-	-
Total Antimony (Ab)	mg/L	0.02	0.006, MAC		<0.00010	0.00014	0.00014	<0.00010	<0.00010	#VALUE!	-	-
Total Arsenic (As)	mg/L	0.005	0.025, MAC		0.00099	0.00075	0.00110	0.00057	0.00057	0.00%	-	-
Total Barium (Ba)	mg/L	5	1.0, MAC		0.0164	0.0468	0.0423	0.0421	0.0420	0.24%	-	-
Total Beryllium (Be)	mg/L	0.0053 (g)	0.004		<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	#VALUE!	-	-
Total Bismuth (Bi)	mg/L	-	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	#VALUE!	-	-
Total Boron (B)	mg/L	1.2	5.0, MAC		<0.010	0.301	0.454	0.294	0.290	1.37%	-	-
Total Cadmium (Cd)	mg/L	0.000018-0.00024 (Hardness 50-1,000 mg/L) (e)	0.005, MAC		0.0000132	0.0000158	0.0000326	<0.0000050	<0.0000050	#VALUE!	-	-
Total Calcium (Ca)	mg/L	4-8 (Sensitive to acid inputs)	-		10.1	70.2	74.5	63.4	63.2	0.32%	-	-
Total Cesium (Cs)	mg/L	-	-		0.000020	0.000020	<0.000010	<0.000010	<0.000010	#VALUE!	-	-
Total Chromium (Cr)	mg/L	0.001 (f)	0.05, MAC		0.00072	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	-	-
Total Cobalt (Co)	mg/L	0.11	-		0.00018	0.00044	0.00017	0.00011	0.00011	0.00%	-	-
Total Copper (Cu)	mg/L	0.007-0.096 (e)	0.5		0.00202	0.00140	0.00084	0.00060	0.00107	56.29%	-	-
Total Iron (Fe)	mg/L	1	<0.3, AO		1.12	0.236	0.047	0.022	0.022	0.00%	-	-
Total Lead (Pb)	mg/L	0.034-1.53 (Hardness 50-1,000 mg/L) (e)	0.05, MAC		0.000154	0.000086	<0.000050	<0.000050	<0.000050	#VALUE!	-	-
Total Lithium (Li)	mg/L	-	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	#VALUE!	-	-
Total Magnesium (Mg)	mg/L	-	700		2.08	15.0	16.6	15.8	15.8	0.00%	-	-
Total Manganese (Mn)	mg/L	0.8-3.8 (e)	<0.05, AO		0.0126	0.130	0.0183	0.00733	0.00643	13.08%	-	-
Total Mercury (Hg)	mg/L	0.0001, MAC	0.001, MAC		0.0000076	<0.0000050	<0.0000050	<0.0000050	<0.0000050	#VALUE!	-	-
Total Molybdenum (Mo)	mg/L	2	0.25		0.000156	0.000565	0.00100	0.000449	0.000429	4.56%	-	-
Total Nickel (Ni)	mg/L	0.025-0.15 (e)	-		0.00129	0.00297	0.00326	0.00236	0.00243	2.92%	-	-
Total Phosphorus (P)	mg/L	0.005-0.015 (for lakes only)	0.01		<0.050	0.050	0.065	<0.050	<0.050	#VALUE!	-	-
Total Potassium (K)	mg/L	373-432	-		0.940	7.37	7.77	6.03	5.99	0.67%	-	-
Total Rubidium (Rb)	mg/L	-	-		0.00074	0.00130	0.00131	0.00079	0.00086	8.48%	-	-
Total Selenium (Se)	mg/L	0.002	0.01, MAC		0.000106	0.000064	0.000070	0.000070	0.000059	17.05%	-	-
Total Silicon (Si)	mg/L	-	-		4.12	3.44	4.56	3.01	3.02	0.33%	-	-
Total Silver (Ag)	mg/L	0.0001-0.003 (e)	0.0001 (g)		0.000015	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	-	-
Total Sodium (Na)	mg/L	-	<200, AO		8.92	33.3	44.7	37.9	38.4	1.31%	-	-
Total Strontium (Sr)	mg/L	-	-		0.0671	0.459	0.467	0.418	0.408	2.42%	-	-
Total Sulphur (S)	mg/L	-	-		<0.50	2.86	1.40	2.75	2.81	2.16%	-	-
Total Tellurium (Te)	mg/L	-	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	#VALUE!	-	-
Total Thallium (Tl)	mg/L	0.0017	0.002		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	#VALUE!	-	-
Total Thorium (Th)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Total Tin (Sn)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Total Titanium (Ti)	mg/L	2	0.1		0.00589	0.00209	0.00071	0.00031	<0.00030	#VALUE!	-	-
Total Tungsten (W)	mg/L	-	-		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	#VALUE!	-	-
Total Uranium (U)	mg/L	0.3	20		0.000022	0.000388	0.000555	0.000355	0.000332	6.70%	-	-
Total Vanadium (V)	mg/L	0.006	0.02		0.00088	<0.00050	<0.00050	<0.00050	<0.00050	#VALUE!	-	-
Total Zinc (Zn)	mg/L	0.003-0.72 (Hardness 50-1,000 mg/L) (e)	5 AO		0.0078	<0.0030	<0.0030	<0.0030	<0.0030	#VALUE!	-	-
Total Zirconium (Zr)	mg/L	-	-		<0.00060	<0.00020	<0.00020	<0.00020	<0.00020	#VALUE!	-	-

	Units	BC MoE Guidelines (a)			24-Jun-20	DUP	RPD	20-Aug-2020
		Freshwater Aquatic Life	Drinking Water	CSR DW				
Field								
Volatile Organic Compounds								
Benzene	µg/L			<0.50	<0.50	-	<0.50	
Ethylbenzene	µg/L			<0.50	<0.50	-	<0.50	
Methyl t-butyl ether (MTBE)	µg/L			<0.50	<0.50	-	<0.50	
Styrene	µg/L			<0.50	<0.50	-	<0.50	
Toluene	µg/L			<0.50	<0.50	-	<0.50	
Xylene, m- and p-	µg/L			<0.50	<0.50	-	<0.50	
Xylene, o-	µg/L			<0.50	<0.50	-	<0.50	
Xylenes, total	µg/L			<0.75	<0.75	-	<0.75	
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	%			93.7	91.2	2.70	93.0	
difluorobenzene, 1,4-	%			106	104	1.90	113	
Hydrocarbons								
EPH (C10-C19)	µg/L			<250	<250	-	<250	
EPH (C19-C32)	µg/L			<250	<250	-	<250	
TEH (C10-C30), BC	µg/L			<250	<250	-	<250	
VHw (C6-C10)	µg/L			<100	<100	-	<100	
VPHw	µg/L			<100	<100	-	<100	
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (EPH su	%			96.3	96.6	0.31	106	
dichlorotoluene, 3,4-	%			101	104	2.93	93.9	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Field	Units	BC MoE Guidelines (a)			SW-09 - E310968							
		Freshwater Aquatic Life	Drinking Water	CSR DW	30-Sep-20	21-Apr-21	20-Jul-21	26-Oct-21	DUP	RPD	18-Jan-22	
Volatile Organic Compounds												
Benzene	µg/L				<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Ethylbenzene	µg/L				<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Methyl t-butyl ether (MTBE)	µg/L				<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Styrene	µg/L				<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Toluene	µg/L				<0.50	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Xylene, m- and p-	µg/L				<0.50	<0.40	<0.40	<0.40	<0.40	#VALUE!	-	
Xylene, o-	µg/L				<0.50	<0.30	<0.30	<0.30	<0.30	#VALUE!	-	
Xylenes, total	µg/L				<0.75	<0.50	<0.50	<0.50	<0.50	#VALUE!	-	
Volatile Organic Compounds Surrogates												
bromofluorobenzene, 4-	%				80.9	100	82.8	89.8	83.2	7.63%	-	
difluorobenzene, 1,4-	%				95.2	102	113	105	104	0.96%	-	
Hydrocarbons												
EPH (C10-C19)	µg/L				80.9	<250	<250	<250	<250	#VALUE!	-	
EPH (C19-C32)	µg/L				95.2	<250	<250	<250	<250	#VALUE!	-	
TEH (C10-C30), BC	µg/L				-	-	-	-	-	-	-	
VHw (C6-C10)	µg/L				<100	<100	<100	<100	<100	#VALUE!	-	
VPHw	µg/L				<100	<100	<100	<100	<100	#VALUE!	-	
Hydrocarbons Surrogates												
bromobenzotrifluoride, 2- (EPH su	%				91.0	103	82.4	101	91.6	9.76%	-	
dichlorotoluene, 3,4-	%				60.1	101	91.4	106	86.6	20.15%	-	

Notes:

- 0.3 A shaded value means exceeded the freshwater aquatic life criteria
- 0.3 A shaded value means reading exceeded the drinking water quality criteria.
- 0.3 A shaded value means exceeded both the aquatic life and drinking water criteria.
- 0.3 A shaded value means reading had detection limit exceeding criteria.

- a. BC Environment Approved and Working Criteria for Water Quality, 2016 and A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³
- A compendium of Working Water Quality Guidelines for BC"
- b. See table 41 in water quality guidelines for details. (AO - Aesthetic Objective)
- c. Limit dependent on chloride concentration. (MAC - Maximum Acceptable Concentration)
- d. Limit pH and temperature dependent.
- e. Limit dependant on hardness. Range given for hardness 50 to 1,000 mg/L.
- f. Limit for chromium (IV)
- g. Limit for total, no dissolved concentrations
- h.copper (mg/L) =(0.094* Hardness)/1000
- i. Limit for hardness based on total dissolved CaCO³

Appendix E Photographs





Photo 1: Hazelton Waste Management Facility SW-01, looking upstream, May 17, 2022



Photo 2: Hazelton Waste Management Facility SW-01, looking downstream, May 17, 2022



Photo 3: Hazelton Waste Management Facility SW-01, looking upstream, August 5, 2022



Photo 4: Hazelton Waste Management Facility SW-01, looking downstream, August 5, 2022



Photo 5: Hazelton Waste Management Facility SW-01, looking upstream, October 12, 2022



Photo 6: Hazelton Waste Management Facility SW-01, looking downstream, October 12, 2022



Photo 7: Hazelton Waste Management Facility SW-02, looking at still wetland, May 17, 2022



Photo 8: Hazelton Waste Management Facility SW-02, looking at still wetland, August 5, 2022



Photo 9: Hazelton Waste Management Facility SW-02, looking at dry wetland, October 12, 2022



Photo 10: Hazelton Waste Management Facility SW-05, looking upstream, May 17, 2022



Photo 4: Hazelton Waste Management Facility SW-05, looking downstream, May 17, 2022



Photo 12: Hazelton Waste Management Facility SW-05, looking upstream, October 12, 2022



Photo 13: Hazelton Waste Management Facility SW-07, looking upstream, June 1, 2022



Photo 14: Hazelton Waste Management Facility SW-07, looking downstream, June 1, 2022



Photo 15: Hazelton Waste Management Facility SW-07, looking upstream dry, August 5, 2022



Photo 16: Hazelton Waste Management Facility SW-07, looking downstream dry, August 5, 2022



Photo 17: Hazelton Waste Management Facility SW-07, looking upstream dry, October 18, 2022



Photo 18: Hazelton Waste Management Facility SW-07, looking downstream, October 18, 2022



Photo 19: Hazelton Waste Management Facility SW-09, looking upstream, June 1, 2022



Photo 20: Hazelton Waste Management Facility SW-09, looking downstream, June 1, 2022



Photo 21: Hazelton Waste Management Facility SW-09, looking upstream, August 5, 2022



Photo 21: Hazelton Waste Management Facility SW-09, looking downstream, August 5, 2022



Photo 22: Hazelton Waste Management Facility SW-09, looking upstream, October 18, 2022



Photo 23: Forceman Ridge Waste Management Facility SW-09, looking downstream, October 18, 2022



Photo 24: Hazelton Waste Management Facility SGW-01, well, January 18, 2022



Photo 25: Hazelton Waste Management Facility SGW-01, well and surface puddle, June 1, 2022



Photo 26: Hazelton Waste Management Facility SGW-01, well, August 4, 2022



Photo 27: Hazelton Waste Management Facility SGW-01, well dry, October 18, 2022



Photo 28: Hazelton Waste Management Facility SGW-02, stick up, January 18, 2022



Photo 29: Hazelton Waste Management Facility SGW-02, stick up, June 1, 2022



Photo 30: Hazelton Waste Management Facility SGW-02, stick up, August 4, 2022



Photo 31: Hazelton Waste Management Facility SGW-02, stick up, October 18, 2022



Photo 32: Hazelton Waste Management Facility SGW-04, well, January 18, 2022



Photo 33: Hazelton Waste Management Facility SGW-04, well, June 1, 2022



Photo 34: Hazelton Waste Management Facility SGW-04, well, August 4, 2022



Photo 35: Hazelton Waste Management Facility SGW-04, well, October 18, 2022



Photo 36: Hazelton Waste Management Facility SGW-05, well, January 18, 2022



Photo 37: Hazelton Waste Management Facility SGW-05, well, June 10, 2022



Photo 38: Hazelton Waste Management Facility SGW-05, well, August 4, 2022



Photo 39: Hazelton Waste Management Facility SGW-05, well, October 18, 2022



Photo 40: Hazelton Waste Management Facility MW-01, well, January 18, 2022



Photo 41: Hazelton Waste Management Facility MW-01, well, May 17, 2022



Photo 42: Hazelton Waste Management Facility MW-01, well, August 4, 2022



Photo 43: Hazelton Waste Management Facility MW-01, well, October 12, 2022



Photo 44: Hazelton Waste Management Facility MW-02, well, January 18, 2022



Photo 45: Hazelton Waste Management Facility MW-02, well, May 17, 2022



Photo 46: Hazelton Waste Management Facility MW-02, well, August 4, 2022



Photo 47: Hazelton Waste Management Facility MW-02, well, October 12, 2022



Photo 48: Hazelton Waste Management Facility MW-03, well, January 18, 2022



Photo 49: Hazelton Waste Management Facility MW-03, well, May 17, 2022



Photo 50: Hazelton Waste Management Facility MW-03, well, August 4, 2022



Photo 51: Hazelton Waste Management Facility MW-03 well, October 12, 2022



Photo 52: Hazelton Waste Management Facility MW-04AB, well, May 17, 2022



Photo 53: Hazelton Waste Management Facility MW-04AB, well, August 4, 2022



Photo 54: Hazelton Waste Management Facility MW-04AB, well, October 12, 2022



Photo 55: Hazelton Waste Management Facility MW-05AB, well, January 18, 2022



Photo 56: Hazelton Waste Management Facility MW-05AB, well, May 17, 2022



Photo 57: Hazelton Waste Management Facility MW-05AB, well, August 4, 2022



Photo 58: Hazelton Waste Management Facility MW-05AB, well, October 18, 2022

Appendix F Data Summary Tables



Table 1
Groundwater and Standpipes Field Observations
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Monitor Well ID	Date	Depth to Water from T.O.P.* (m)	Depth to bottom from T.O.P.* (m)	Ground Elevation (masl)	Casing Height (mags)	Groundwater Elevation (masl)	Field Temperature (°C)	Conductivity (µs/cm)	DO (mg/L)	ORP (mV)	Field pH	Apparent NAPL Thickness (mm)	
BH-01	1/18/2022	20.9	32.0	501.0	0.4	480.5	6.4	315.8	2.6	113.9	7.3	nil	
	5/17/2022	20.8	32.4		0.4	480.6	6.7	238.4	4.1	208.0	8.2	nil	
	8/4/2022	20.9	32.6		0.4	480.5	7.6	384.5	4.0	132.8	7.6	nil	
	10/12/2022	20.8	32.5		0.4	480.5	6.5	373.4	1.7	205.4	7.7	nil	
	2/2/2023	20.7	32.5		0.4	480.7	7.6	600.0	-	-	-	nil	
BH-02	1/18/2022	22.6	32.7	465.0	0.4	442.8	6.2	579.0	3.7	147.7	7.7	nil	
	5/17/2022	20.6	32.7		0.4	444.8	6.4	595.0	4.0	243.0	7.3	nil	
	8/4/2022	20.6	33.9		0.4	485.2	7.4	612.0	4.3	193.3	7.2	nil	
	10/12/2022	20.6	32.9		0.4	485.2	6.3	588.0	3.9	195.8	7.2	nil	
	2/2/2023	20.5	32.7		0.4	485.1	6.6	900.0	-	-	-	nil	
BH-03	1/18/2022	57.0	59.6	448.0	0.5	391.6	7.0	-	-	-	-	nil	
	5/17/2022	56.9	59.8		0.5	391.7	7.1	-	-	-	-	nil	
	8/4/2022	56.8	59.8		0.6	391.8	7.5	-	-	-	-	nil	
	10/12/2022	56.8	59.7		0.5	391.7	-	-	-	-	-	nil	
	2/2/2023	56.9	60.0		0.5	391.6	7.4	794.0	-	-	-	nil	
BH-04A	1/18/2022	15.0	18.0	458.0	1.6	441.4	5.8	-	-	-	-	nil	
	4/17/2022	14.6	18.0		1.1	442.3	6.2	522.0	3.6	246.6	7.6	nil	
	8/4/2022	14.8	17.9		0.8	442.4	8.6	518.0	10.9	207.8	7.6	nil	
	10/18/2022	14.9	18.0		1.2	442.0	9.3	523.0	9.1	186.9	7.3	nil	
	2/2/2023	14.9	18.0		1.2	441.9	6.1	757.0	-	-	-	nil	
BH-04B	1/18/2022	2.0	2.9	458.0	1.6	454.4	2.6	127.0	3.8	107.9	7.3	nil	
	5/17/2022	2.1	3.0		1.2	454.7	4.7	229.6	11.2	121.1	7.1	nil	
	8/4/2022	3.1	3.1		1.1	453.8	9.5	-	-	-	-	nil	
	10/18/2022	3.0	3.0		1.2	453.8	-	-	-	-	-	nil	
	2/2/2023	1.5	2.9		1.2	455.3	3.4	150.0	-	-	-	nil	
BH-05A	1/18/2022	18.7	18.8	435.0	0.6	415.7	4.2	-	-	-	-	nil	
	5/17/2022	18.7	19.0		0.7	415.7	-	-	-	-	-	nil	
	8/4/2022	18.7	19.0		0.6	415.7	9.5	-	-	-	-	nil	
	10/18/2022	18.7	18.9		0.6	415.7	-	-	-	-	-	nil	
	2/2/2023	18.7	19.0		0.6	415.7	6.6	1335.0	-	-	-	nil	
BH-05B	1/18/2022	3.0	5.8	435.0	0.6	431.4	5.5	1064.0	0.7	197.4	6.9	nil	
	5/17/2022	2.6	5.2		0.7	431.7	6.5	1143.0	10.1	142.7	7.1	nil	
	8/4/2022	2.9	5.8		0.6	431.5	10.3	1342.0	3.8	98.7	6.6	nil	
	10/18/2022	-	5.8		0.7	-	10.4	1347.0	1.4	189.0	4.9	nil	
	2/2/2023	3.4	5.8		0.6	431.0	6.6	6061.0	-	-	-	nil	
SGW-01	6/1/2022	-	-	430.0	0.5	-	8.8	151.6	0.7	108.8	7.4	nil	
	8/4/2022	0.9	1.2		0.5	428.6	13.4	226.1	1.1	10.0	7.1	nil	
SGW-02	6/1/2022	-	-	427.0	-	-	14.6	390.4	4.4	227.2	7.5	nil	
	8/4/2022	1.1	3.0		1.0	424.9	13.5	504.0	5.6	158.2	7.3	nil	
	10/18/2022	1.1	2.9		1.1	424.9	8.3	504.0	0.8	171.5	6.8	nil	
SGW-04	8/4/2022	1.2	5.2	420.0	0.6	418.3	11.1	450.1	0.7	46.7	7.0	nil	
	10/18/2022	1.5	5.2		0.6	417.9	9.4	448.1	0.7	177.1	6.8	nil	
SGW-05	6/1/2022	-	-	431.0	-	-	7.6	266.4	1.0	144.5	7.6	nil	
	6/1/2022	-	-		-	-	-	7.2	331.8	0.8	170.7	7.4	nil
	8/4/2022	1.3	5.2		0.8	428.9	14.1	165.0	0.8	67.8	7.3	nil	
	10/18/2022	1.5	5.1		0.9	428.7	9.1	315.8	2.3	163.8	7.1	nil	

Notes:

- LTDL - Less than instrument detection limit
- NAPL - Non aqueous phase liquid
- m - Meters
- mm - Millimeters
- mbgs - Meters below grade
- ppmv - Parts per million by volume
- n.m. - Not measured
- T.O.P - Top of pipe
- MW - Monitoring Well sampling for groundwater
- nc - not collected
- ns - not surveyed
- nv - no value

Table 2
Surface Water Field Observations
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Site ID	Date	Water Temperature (°C)	DO (mg/L)	Conductivity (µs/cm)	Field pH	ORP (mv)	NTU	Apparent NAPL Thickness (mm)
SW-01	5/17/2022	7	0.9	28.2	6	229.7	0.65	nil
	8/5/2022	13.8	1.4	38.4	5.75	184	4.5	nil
	10/12/2022	6.7	0.7	51.3	6.27	159.1	5.53	nil
SW-02	5/17/2022	7.1	2.6	66.5	6.07	279.5	1.88	nil
	8/5/2022	13.3	1.6	107.9	6.76	195.4	1.6	nil
	10/12/2022	7.1	0.4	163.6	6.52	96	19.5	nil
SW-05	5/17/2022	12.8	6.1	97.9	6.72	236.7	0.66	nil
	8/5/2022	16.3	0.5	141.9	5.89	184.3	1.34	nil
	10/18/2022	9	1.9	149.6	7.05	68.9	4.44	nil
SW-07	6/1/2022	11	7.8	109.6	7.28	228.3	0.97	nil
SW-09	6/1/2022	14.8	9	512	8.2	223.4	0.56	nil
	8/5/2022	14.5	1.7	648	7.8	197.7	0.59	nil
	10/18/2022	8.9	6.6	550	7.78	221.5	2.14	nil

Notes:

- NAPL - on aqueous phase liquid
- m - Meters
- mm - Millimeters
- mbgs - Meters below grade
- ppmv - parts per million by volume
- n.m. - Not measured
- T.O.P - Top of pipe
- MW - 3 Well sampling for groundwater
- nc - not collected
- ns - not surveyed
- nv - no value

Table 3
Leachate Field Observations
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Site ID	Date	Water Temperature (°C)	DO (mg/L)	Conductivity (µs/cm)	Field pH	ORP (mv)	NTU	Apparent NAPL Thickness (mm)
Post Sand Filter	10/11/2022	12.1	12	724	7.18	208.7	1.46	nil
	7/12/2022	18.4	1.2	833	7.17	170.8	-	nil
W4-Weir	1/18/2022	0.3	4.5	689	7.53	227.5	-	nil
	1/19/2022	0.3	3.4	593	7.28	249.4	-	nil
	3/30/2022	7.2	4.2	414.5	7	-	3.1	nil
	7/6/2022	20.4	8.4	762	7.64	245.9	4.97	nil
	7/12/2022	17.5	5.4	708	6.71	258.1	-	nil
	8/8/2022	22.5	8.7	798	7.63	223.6	1.97	nil
	10/11/2022	8.6	53	535	7.61	206.2	2.04	nil

Notes:

- NAPL - on aqueous phase liquid
- ppmv - parts per million by volume
- n.m. - Not measured
- nc - not collected
- ns - not surveyed
- nv - no value

Table 4
Summary of Groundwater Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location			12-Oct-22 BH-01 RDKS ALS VA22C4785 VA22C4785-001	12-Oct-22 BH-02 RDKS ALS VA22C4785 VA22C4785-002	12-Oct-22 BH-03 RDKS ALS VA22C4785 VA22C4785-003	18-Oct-22 BH-4A RDKS ALS VA22C5460 VA22C5460-001	18-Oct-22 BH-5B RDKS ALS VA22C5460 VA22C5460-002	18-Oct-22 Field Blank RDKS ALS VA22C5460 VA22C5460-003 Field Blank
Sample Date								
Sample ID								
Sampling Company								
Laboratory								
Laboratory Work Order								
Laboratory Sample ID								
Sample Type	Units	A B CSR-Schedule 3.2						
General Parameters								
Alkalinity, Total	mg/L	n/v	331	468	239	266	548	< 1.0
pH, lab	S.U.		8.36	8.06	8.1	8.43	7.53	5.35
Electrical Conductivity, Lab	µmhos/cm	n/v	537	795	760	747	1820	< 2.0
Hardness (as CaCO3)	mg/L	n/v	259	471	214	204	828	<0.60
Sulfate	mg/L	500 ^A 1,280/2,180/3,090/4,290 _{S12} ^B	10.5	57.7	179	136	<3.00	< 0.30
Ammonia (as N)	mg/L	1.3/18.4 _{S1} ^B	0.142	0.183	<0.0050	<0.0050	0.272	< 0.0050
Bromide	mg/L	n/v	<0.050	<0.250	<0.250	<0.250	3.150	<0.050
Chloride	mg/L	250 ^A 1,500 ^B	<0.50	<2.50	<2.50	<2.50	297^A	< 0.50
Chemical Oxygen Demand	mg/L	n/v	66	71	<10	<10	31	< 10
Fluoride	mg/L	1.5 ^A 2.0/3.0 _{S5} ^B	0.054	<0.100	<0.100	<0.100	<0.200	< 0.020
Total Kjeldahl Nitrogen	mg/L	n/v	0.308	0.197	0.076	0.105	0.547	< 0.050
Nitrate (as N)	mg/L	10 ^A 400 ^B	0.0165	<0.0250	0.183	0.389	<0.0500	< 0.0050
Nitrite (as N)	mg/L	1.0 ^A 0.20/0.40/0.60/0.80-2.0 _{S8} ^B	0.001	<0.0050	<0.0050	<0.0050	<0.0100	< 0.0010
Sodium	mg/L	200 ^A	29.5	24.1	90.3	92.8	71.6	< 0.050
Dissolved Organic Carbon (DOC)	mg/L	n/v	1.29	1.02	1.05	1.41	5.13	0.67
Total Organic Carbon	mg/L	n/v	16	6.93	2.66	1.7	5.79	< 0.50
BTEX and PHCs								
Benzene	µg/L	5 ^A 400 ^B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	60 ^A 5 ^B	3.04	3.6	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene	µg/L	140 ^A 2,000 ^B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylene, m & p-	µg/L	n/v	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, o-	µg/L	n/v	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes, Total	µg/L	90 ^A 300 ^B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
VH (C6-C10)	µg/L	15,000 ^{AB}	<100	<100	<100	<100	<100	<100
EPH C10-C19	µg/L	5,000 ^{AB}	<250	<250	<250	<250	<250	<250
EPH C19-C32	µg/L	n/v	<250	<250	<250	<250	<250	<250
EPH (C10-C32)	µg/L	n/v	<400	<400	<400	<400	<400	<400
Total Extractable Hydrocarbons	µg/L	n/v	<250	<250	<250	<250	<250	<250
Volatile Petroleum Hydrocarbons (VPH)	µg/L	1,500 ^B	<100#2	<100	<100	<100	<100	<100
Styrene	µg/L	800 ^A 720 ^B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/L	95 ^A 34,000 ^B	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

See notes last page

Table 4
Summary of Groundwater Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location			12-Oct-22 BH-01 RDKS ALS VA22C4785 VA22C4785-001	12-Oct-22 BH-02 RDKS ALS VA22C4785 VA22C4785-002	12-Oct-22 BH-03 RDKS ALS VA22C4785 VA22C4785-003	18-Oct-22 BH-4A RDKS ALS VA22C5460 VA22C5460-001	18-Oct-22 BH-5B RDKS ALS VA22C5460 VA22C5460-002	18-Oct-22 Field Blank RDKS ALS VA22C5460 VA22C5460-003 Field Blank
Sample Date								
Sample ID								
Sampling Company								
Laboratory								
Laboratory Work Order								
Laboratory Sample ID								
Sample Type	Units	A B CSR-Schedule 3.2						
Dissolved metlas								
Aluminum	mg/L	9.5 ^A	0.0130	0.0031	0.001	0.0129	0.0019	< 0.0010
Antimony	mg/L	0.0060 ^A 0.090 ^B	<0.00010	<0.00010	0.00028	0.00021	<0.00010	< 0.00010
Arsenic	mg/L	0.010 ^A 0.050 ^B	0.00606	0.00148	0.00036	0.00043	0.00928	< 0.00010
Barium	mg/L	1.0 ^A 10 ^B	0.313	0.055	0.0265	0.0664	0.281	< 0.00010
Beryllium	mg/L	0.0080 ^A 0.0015 ^B	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	< 0.00010
Bismuth	mg/L	n/v	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	< 0.000050
Boron	mg/L	5.0 ^A 12 ^B	0.098	0.078	0.057	0.05	0.014	< 0.010
Calcium	mg/L	n/v	38.7	81.3	63.1	54.8	224	< 0.050
Cadmium	mg/L	0.0050 ^A 0.00050/0.0015/0.0025/0.0035/0.0040 _{S3} ^B	0.0000124	0.0000119	0.0000917	0.0000304	0.0000162	< 0.000050
Cesium	mg/L	n/v	<0.000010	0.00001	<0.000010	<0.000010	<0.000010	<0.000010
Chromium	mg/L	0.050 _{S23} ^A 0.010 _{S23} ^B	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	0.0010 ^A 0.040 ^B	0.00010	0.00051	<0.00010	<0.00010	0.00488^A	< 0.00010
Copper	mg/L	1.5 ^A 0.020/0.030/0.040/0.050/0.060-0.090 _{S4} ^B	0.00079	<0.00020	0.00057	0.00201	0.00037	< 0.00020
Iron	mg/L	6.5 ^A	0.163	0.153	<0.010	<0.010	6.26	< 0.010
Lead	mg/L	0.010 ^A 0.040/0.050/0.060/0.11/0.16 _{S6} ^B	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	< 0.000050
Lithium	mg/L	0.0080 ^A	0.0012	0.0039	0.0018	0.0015	0.0033	< 0.0010
Magnesium	mg/L	n/v	39.4	65	13.6	16.4	65.3	< 0.0050
Manganese	mg/L	1.5 ^A	0.160	0.149	0.00063	0.00052	4.37^A	< 0.00010
Mercury	mg/L	0.0010 ^A 0.00025 ^B	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	< 0.000050
Molybdenum	mg/L	0.25 ^A 10 ^B	0.00292	0.0023	0.00553	0.00311	0.00058	< 0.000050
Nickel	mg/L	0.080 ^A 0.25/0.65/1.1/1.5 _{S7} ^B	<0.00050	<0.00050	<0.00050	<0.00050	0.00735	0.00168
Phosphorus	mg/L	n/v	<0.050	<0.050	<0.050	<0.050	0.106	< 0.050
Potassium	mg/L	n/v	2.13	2.64	2.02	1.69	4.61	< 0.050
Rubidium	mg/L	n/v	0.00039	0.00054	0.00042	0.00029	0.0008	< 0.00020
Selenium	mg/L	0.010 ^A 0.020 ^B	<0.000050	<0.000050	0.000322	0.00107	<0.000050	< 0.000050
Silicon	mg/L	n/v	3.520	7.8	3.590	4.050	9.010	< 0.050
Silver	mg/L	0.020 ^A 0.00050/0.015 _{S11} ^B	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	< 0.000010
Strontium	mg/L	2.5 ^A	1.18	1.92	0.894	0.824	1.72	< 0.00020
Sulfur	mg/L	n/v	3.73	21.3	61.6	52.6	1.16	< 0.50
Tellurium	mg/L	n/v	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	< 0.00020
Thallium	mg/L	0.0030 ^B	<0.000010	<0.000010	0.000011	<0.000010	0.000014	< 0.000010
Thorium	mg/L	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	< 0.00010
Tin	mg/L	2.5 ^A	0.00023	<0.00010	<0.00010	<0.00010	<0.00010	< 0.00010
Titanium	mg/L	1.0 ^B	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	< 0.00030
Tungsten	mg/L	0.0030 ^A	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	< 0.00010
Uranium	mg/L	0.020 ^A 0.085 ^B	0.000488	0.000944	0.00205	0.00335	0.0025	< 0.000010
Vanadium	mg/L	0.020 ^A	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	< 0.00050
Zinc	mg/L	3.0 ^A 0.075/0.15/0.90-2.4 _{S13} ^B	0.0021	0.0011	0.0028	0.0018	0.0019	< 0.0010
Zirconium	mg/L	n/v	<0.00020	<0.00020	<0.00020	<0.00020	0.0002	< 0.00020

See notes last page

Table 4
Summary of Groundwater Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Notes:

↳-Schedule CSR Schedule 3.2 - Generic Numerical Water Standards (Contaminated Sites Regulation [B.C. Reg. 375/96, April 1, 1997: includes amendments up to July 7, 2021 by B.C. Reg. 179/2021])

^A Generic Standard - Drinking Water

^B Generic Standard - Aquatic Life (Freshwater)

6.5^A Concentration exceeds the indicated standard.

15.2 Measured concentration did not exceed the indicated standard.

<0.50 Laboratory reporting limit was greater than the applicable standard.

<0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.

n/v No standard/guideline value.

- Parameter not analyzed / not available.

S1 Ammonia, total (as N) varies with pH for freshwater aquatic life. 1310@pH≥8.5, 3700@pH8.0-<8.5, 11300@pH7.5-<8.0, 18500@pH7.0-<7.5, 18400@pH<7.0

S3 Cadmium varies with hardness for freshwater aquatic life. 0.5 ug/L@H<30 mg/L, 1.5 ug/L@H30-<90 mg/L, 2.5 ug/L@H90-<150 mg/L, 3.5 ug/L@H150-<210 mg/L, 4 ug/L@H≥210 mg/L.

S4 Copper varies with hardness for freshwater aquatic life. 20 ug/L@H<50 mg/L, 30 ug/L@H=50-<75 mg/L, 40 ug/L@H=75-<100 mg/L, 50 ug/L@H=100-<125 mg/L, 60 ug/L@H=125-<150 mg/L, 70 ug/L@H=150-<175 mg/L, 80 ug/L@H=175-<200 mg/L, 90 ug/L@H≥200 mg/L.

S5 Fluoride varies with hardness for freshwater aquatic life. 2000@H<50, 3000@H≥50.

S6 Lead varies with hardness for freshwater aquatic life. 40 ug/L@H<50 mg/L, 50 ug/L@H=50-<100 mg/L, 60 ug/L@H=100-<200 mg/L, 110 ug/L@H=200-<300 mg/L, 160 ug/L@H≥300 mg/L.

S7 Nickel varies with hardness for freshwater aquatic life. 250 ug/L@H<60 mg/L, 650 ug/L@H60-<120 mg/L, 1100 ug/L@H120-<180 mg/L, 1500 ug/L@H≥180 mg/L.

S8 Nitrite (as N) varies with Chloride concentration for aquatic life. 200(Cl<2mg/L), 400(Cl<4mg/L), 600(Cl4-<6mg/L), 800(Cl6-<8mg/L), 1000(Cl8<10mg/L), 2000(Cl>10mg/L).

S11 Silver varies with hardness for freshwater aquatic life. 0.5 ug/L@H≤100 mg/L, 15 ug/L@H>100 mg/L.

S12 Sulfate varies with hardness for aquatic life. 1280mg/L @ H≤30, 2180mg/L @ H31-75, 3090mg/L @ H76-180, 4290mg/L @ H>180.

S13 Zinc varies with hardness for freshwater aquatic life. 75 ug/L@H<90 mg/L, 150 ug/L@H=90-<100 mg/L, 900 ug/L@H=100-<200 mg/L, 1650 ug/L@H=200-<300 mg/L, 2400 ug/L@H=300-<400 mg/L.

S23^{AB} The standard is for Chromium Hexavalent.

Table 5
Summary of Groundwater Standpipes Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location					SGW-01 2-Jun-22 SGW-01	SGW-02 2-Jun-22 SGW-02	18-Oct-22 SGW-02	SGW-04 2-Jun-22 SGW-04	18-Oct-22 SGW-04	SGW-05 2-Jun-22 SGW-05	18-Oct-22 SGW-05	18-Oct-22 Travel Blank
Sample Date					ALS VA22B2453 VA22B2453-004	ALS VA22B2453 VA22B2453-005	ALS VA22C5462 VA22C5462-004	ALS VA22B2453 VA22B2453-006	ALS VA22C5462 VA22C5462-005	ALS VA22B2453 VA22B2453-007	ALS VA22C5462 VA22C5462-006	ALS VA22C5462 VA22C5462-007
Sample ID	Units	A B CSR-Schedule 3.2	C D BC WQG-Approved	E BC WQG-Working								
Sampling Company												
Laboratory												
Laboratory Work Order												
Laboratory Sample ID												
Sample Type												
Dissolved Metals												
Aluminum	mg/L	9.5 ^B	0.1 ^C 0.05 ^D	n/v	0.0899 ^D	0.0217	0.0271	0.0574 ^D	0.0476	0.0185	0.0134	-
Antimony	mg/L	0.090 ^A 0.0060 ^B	n/v	0.0090 ^E	0.00012	0.0001	< 0.00010	0.00012	0.00012	< 0.00010	< 0.00010	-
Arsenic	mg/L	0.050 ^A 0.010 ^B	0.0050 ^C	n/v	0.00099	0.00192	0.0026	0.00137	0.00232	0.0015	0.00135	-
Barium	mg/L	10 ^A 1.0 ^B	n/v	1 ^E	0.0187	0.0316	0.0669	0.0553	0.103	0.0425	0.0637	-
Beryllium	mg/L	0.0015 ^A 0.0080 ^B	n/v	0.00013 ^E	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	-
Bismuth	mg/L	n/v	n/v	n/v	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	-
Boron	mg/L	12 ^A 5.0 ^B	1.2 ^D	n/v	0.015	0.248	0.32	0.01	< 0.010	< 0.010	< 0.010	-
Cadmium	mg/L	0.00050/0.0015/0.0025/0.0035/0.0040 _{S3} ^A 0.0050 ^B	0.00055-0.0017 ^C 0.0002-0.00044 ^D	n/v	0.0000143	0.0000065	< 0.0000050	0.00003	0.0000547	0.0000207	0.0000166	-
Calcium	mg/L	n/v	n/v	n/v	30.3	62.6	66.8	74.8	94.4	60.2	68.1	-
Cesium	mg/L	n/v	n/v	n/v	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	-
Chromium	mg/L	0.010 _{S23} ^A 0.050 _{S23} ^B	n/v	n/v	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	-
Cobalt	mg/L	0.040 ^A 0.0010 ^B	0.11 ^C 0.0040 ^D	n/v	0.00039	0.00067	0.00086	0.00212 ^B	0.00444 ^B	0.00134 ^B	0.00623 ^B	-
Copper	mg/L	0.020/0.030/0.040/0.050/0.060-0.090 _{S4} ^A 1.5 ^B	CALC ^C LOOKUP ^D	n/v	0.00234	0.0004	0.00025	0.00263	0.00158	0.00126	0.00056	-
Iron	mg/L	6.5 ^B	0.35 ^C	n/v	0.265	0.514 ^C	1.11 ^C	2.66 ^C	4.08 ^C	0.944 ^C	1.65 ^C	-
Lead	mg/L	0.040/0.050/0.060/0.11/0.16 _{S6} ^A 0.010 ^B	n/v	n/v	< 0.000050	< 0.000050	< 0.000050	0.000057	0.000054	< 0.000050	< 0.000050	-
Lithium	mg/L	0.0080 ^B	n/v	n/v	< 0.0010	< 0.0010	< 0.0010	0.0013	0.002	< 0.0010	0.0015	-
Magnesium	mg/L	n/v	n/v	n/v	4.2	14.2	18	24.2	26.4	13.4	16.1	-
Manganese	mg/L	1.5 ^B	n/v	n/v	0.276	0.62	0.524	1.41	2.5 ^B	1.06	1.32	-
Mercury	mg/L	0.00025 ^A 0.0010 ^B	n/v	n/v	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	-
Molybdenum	mg/L	10 ^A 0.25 ^B	46 ^C 7.6 ^D	n/v	0.000251	0.000277	0.000301	0.00237	0.00186	0.00155	0.00184	-
Nickel	mg/L	0.25/0.65/1.1/1.5 _{S7} ^A 0.080 ^B	n/v	n/v	0.00151	0.0023	0.00383	0.00378	0.00617	0.00219	0.00263	-
Phosphorus	mg/L	n/v	15 ^D	n/v	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-
Potassium	mg/L	n/v	n/v	n/v	0.876	4.9	7.24	1.39	2	1.08	1.62	-
Rubidium	mg/L	n/v	n/v	n/v	0.00046	0.00153	0.00193	0.00021	0.00034	0.00024	0.00038	-
Selenium	mg/L	0.020 ^A 0.010 ^B	0.0020 ^D	n/v	0.000094	0.000132	0.000065	0.000127	0.000145	< 0.000050	< 0.000050	-
Silicon	mg/L	n/v	n/v	n/v	3.98	2.33	5.12	4.64	6.15	4.47	5.33	-
Silver	mg/L	0.00050/0.015 _{S11} ^A 0.020 ^B	n/v	n/v	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	-
Sodium	mg/L	200 ^B	n/v	n/v	2.23	28	51.3	4.6	7.9	5.47	6.44	-
Strontium	mg/L	2.5 ^B	n/v	n/v	0.161	0.39	0.48	0.617	0.856	0.394	0.558	-
Sulfur	mg/L	n/v	n/v	n/v	< 0.50	< 0.50	< 0.50	0.92	< 0.50	0.52	0.98	-
Tellurium	mg/L	n/v	n/v	n/v	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	-
Thallium	mg/L	0.0030 ^A	0.00080 ^E	n/v	< 0.000010	< 0.000010	< 0.000010	< 0.000010	0.00001	< 0.000010	< 0.000010	-
Thorium	mg/L	n/v	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Tin	mg/L	2.5 ^B	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Titanium	mg/L	1.0 ^A	n/v	n/v	0.00105	0.00058	0.00055	0.0008	0.00085	0.00037	< 0.00030	-
Tungsten	mg/L	0.0030 ^B	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	-
Uranium	mg/L	0.085 ^A 0.020 ^B	n/v	0.0085 _{n7} ^E	0.000022	0.000126	0.000227	0.000633	0.000668	0.000259	0.00037	-
Vanadium	mg/L	0.020 ^B	n/v	n/v	< 0.00050	< 0.00050	< 0.00050	< 0.00050	0.00055	< 0.00050	< 0.00050	-
Zinc	mg/L	0.075/0.15/0.90-2.4 _{S13} ^A 3.0 ^B	n/v	n/v	0.0015	0.0011	0.001	< 0.0010	< 0.0010	< 0.0010	< 0.0010	-
Zirconium	mg/L	n/v	n/v	n/v	0.0004	< 0.00020	< 0.00020	< 0.00020	0.00037	< 0.00020	< 0.00020	-

See notes last page

Table 5
Summary of Groundwater Standpipes Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location					SGW-01 2-Jun-22 SGW-01	SGW-02 2-Jun-22 SGW-02	SGW-02 18-Oct-22 SGW-02	SGW-04 2-Jun-22 SGW-04	SGW-04 18-Oct-22 SGW-04	SGW-05 2-Jun-22 SGW-05	SGW-05 18-Oct-22 SGW-05	18-Oct-22 Travel Blank
Sample Date					ALS VA22B2453 VA22B2453-004	ALS VA22B2453 VA22B2453-005	ALS VA22C5462 VA22C5462-004	ALS VA22B2453 VA22B2453-006	ALS VA22C5462 VA22C5462-005	ALS VA22B2453 VA22B2453-007	ALS VA22C5462 VA22C5462-006	ALS VA22C5462 VA22C5462-007 Trip Blank
Sample ID	Units	A B CSR-Schedule 3.2	C D BC WQG-Approved	E BC WQG-Working								
Sampling Company												
Laboratory												
Laboratory Work Order												
Laboratory Sample ID												
Sample Type												
BTEX and PHC												
Benzene	µg/L	400 ^A 5 ^B	40 ^D	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene	µg/L	2,000 ^A 140 ^B	200 ^D	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methyl tert-butyl ether (MTBE)	µg/L	34,000 ^A 95 ^B	3,400 ^C	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene	µg/L	720 ^A 800 ^B	n/v	72 ^E	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	µg/L	5 ^A 60 ^B	0.5 ^D	n/v	< 0.50	< 0.50	< 0.50	< 0.50	0.9 ^D	< 0.50	< 0.50	< 0.50
Xylene, m & p-	µg/L	n/v	n/v	n/v	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Xylene, o-	µg/L	n/v	n/v	n/v	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Xylenes, Total	µg/L	300 ^A 90 ^B	30 ^D	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
EPH (C10-C32)	µg/L	n/v	n/v	n/v	< 400	< 400	< 400	< 400	< 400	< 400	< 400	< 400
EPH C10-C19	µg/L	5,000 ^{AB}	n/v	n/v	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250
EPH C19-C32	µg/L	n/v	n/v	n/v	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250
Total Extractable Hydrocarbons	µg/L	n/v	n/v	n/v	-	-	< 250	-	< 250	-	< 250	< 250
Volatile Petroleum Hydrocarbons (VPH)	µg/L	1,500 ^A	n/v	n/v	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
VH (C6-C10)	µg/L	15,000 ^{AB}	n/v	n/v	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100

See notes last page

Table 5
Summary of Groundwater Standpipes Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Notes:

- ↳-Schedule CSR Schedule 3.2 - Generic Numerical Water Standards (Contaminated Sites Regulation [B.C. Reg. 375/96, April 1, 1997: includes amendments up to July 7, 2021 by B.C. Reg. 179/2021])
 - A Generic Standard - Aquatic Life (Freshwater)
 - B Generic Standard - Drinking Water
- NQG-Appr British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (Aug 2019)
 - C Approved Water Quality Guidelines - Short-Term Acute (Freshwater Aquatic Life)
 - D Approved Water Quality Guidelines - Long-Term Chronic (Freshwater Aquatic Life)
- WQG-Wor British Columbia Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (June 2017)
 - E Working Water Quality Guidelines - Freshwater aquatic life
- 6.5^A** Concentration exceeds the indicated standard.
- 15.2 Measured concentration did not exceed the indicated standard.
- <0.50** Laboratory reporting limit was greater than the applicable standard.
- <0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.
- n/v No standard/guideline value.
- Parameter not analyzed / not available.
- CD Guideline to be calculated. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
- LOOKUP^{CD} Guideline is a lookup value. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
- LOOKUP/CALC^C Guideline is a lookup and calculation. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
- n1 Long-term median within 20% of background median
- n7 Guideline was developed by CCME using the species sensitivity distribution (SSD) method. This method has not been adopted by BC and therefore the lower fudicial limit of the SSD 5th percentile is adopted as the BC WWQG.
- n9 To calculate the WWQG for nickel at hardness >60 to <180 mg/L use the equation: $WWQG (\mu\text{g/L}) = e^{0.76[\ln(\text{hardness})] + 1.06}$; where hardness is in mg/L CaCO3.
- s1 Ammonia, total (as N) varies with pH for freshwater aquatic life. 1310@pH≥8.5, 3700@pH8.0-<8.5, 11300@pH7.5-<8.0, 18500@pH7.0-<7.5, 18400@pH<7.0
- s3 Cadmium varies with hardness for freshwater aquatic life. 0.5 ug/L@H<30 mg/L, 1.5 ug/L@H30-<90 mg/L, 2.5 ug/L@H90-<150 mg/L, 3.5 ug/L@H150-<210 mg/L, 4 ug/L@H≥210 mg/L.
- s4 Copper varies with hardness for freshwater aquatic life. 20 ug/L@H<50 mg/L, 30 ug/L@H=50-<75 mg/L, 40 ug/L@H=75-<100 mg/L, 50 ug/L@H=100-<125 mg/L, 60 ug/L@H=125-<150 mg/L, 70 ug/L@H=150-<175 mg/L, 80 ug/L@H=175-<200 mg/L, 90 ug/L@H≥200 mg/L.
- s5 Fluoride varies with hardness for freshwater aquatic life. 2000@H<50, 3000@H≥50.
- s6 Lead varies with hardness for freshwater aquatic life. 40 ug/L@H<50 mg/L, 50 ug/L@H=50-<100 mg/L, 60 ug/L@H=100-<200 mg/L, 110 ug/L@H=200-<300 mg/L, 160 ug/L@H≥300 mg/L.
- s7 Nickel varies with hardness for freshwater aquatic life. 250 ug/L@H<60 mg/L, 650 ug/L@H60-<120 mg/L, 1100 ug/L@H120-<180 mg/L, 1500 ug/L@H≥180 mg/L.
- s8 Nitrite (as N) varies with Chloride concentration for aquatic life. 200(Cl<2mg/L), 400(Cl<4mg/L), 600(Cl4-<6mg/L), 800(Cl6-<8mg/L), 1000(Cl8<10mg/L), 2000(Cl>10mg/L).
- s11 Silver varies with hardness for freshwater aquatic life. 0.5 ug/L@H≤100 mg/L, 15 ug/L@H>100 mg/L.
- s12 Sulfate varies with hardness for aquatic life. 1280mg/L @ H≤30, 2180mg/L @ H31-75, 3090mg/L @ H76-180, 4290mg/L @ H>180.
- s13 Zinc varies with hardness for freshwater aquatic life. 75 ug/L@H<90 mg/L, 150 ug/L@H=90-<100 mg/L, 900 ug/L@H=100-<200 mg/L, 1650 ug/L@H=200-<300 mg/L, 2400 ug/L@H=300-<400 mg/L.
- S23^{AB} The standard is for Chromium Hexavalent.

Table 6
Summary of Surface Water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location				17-May-22 SW-01	SW-01 5-Aug-22 SW-01	12-Oct-22 SW-01	17-May-22 SW-02	SW-02 5-Aug-22 SW-02	12-Oct-22 SW-02
Sample Date				ALS VA22B1224 VA22B1224-003	ALS VA22B8570 VA22B8570-004	ALS VA22C4786 VA22C4786-001	ALS VA22B1224 VA22B1224-004	ALS VA22B8570 VA22B8570-003	ALS VA22C4786 VA22C4786-002
Sample ID									
Sampling Company									
Laboratory									
Laboratory Work Order									
Laboratory Sample ID									
Sample Type	Units	A B C BC WQG-Approved	D BC WQG-Working						
General Parameters									
pH, lab	S.U.	6.5-9 ^B	n/v	7.44	6.59	7.27	7.83	7.7	8.06
Ammonia (as N)	mg/L	0.922 ^B	n/v	< 0.0050	0.0486	0.0341	< 0.0050	0.338	4.3^B
Alkalinity, Total	mg/L	<20 ^A	n/v	22.9	23.7	18.5^A	57	73.5	114
Electrical Conductivity, Lab	µmhos/cm	n/v	n/v	44.5	39.9	42.3	107	131	214
Hardness (as CaCO3)	mg/L	n/v	n/v	20.3	27.4	21.3	50.9	62.3	132
Nitrogen (Total)	mg/L	n/v	n/v	1.58	-	-	0.426	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.382	15.2	1.01	0.359	1	14.4
Chemical Oxygen Demand	mg/L	n/v	n/v	32	418	61	28	52	464
Dissolved Organic Carbon (DOC)	mg/L	n ^B	n/v	14.6	19.5	17.9	12.1	17.7	30.7
Total Organic Carbon	mg/L	n ^B	n/v	15.1	62.2	19.6	12	18	60.1
Chloride	mg/L	600 ^A 150 ^B	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.97
Sulfate	mg/L	128-429 ^B	n/v	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Bromide	mg/L	n/v	n/v	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoride	mg/L	0.7-1.14 ^A	n/v	0.032	0.025	0.025	0.056	0.062	0.071
Nitrate (as N)	mg/L	32.8 ^A 3 ^B	n/v	< 0.0050	0.01	< 0.0050	< 0.0050	< 0.0050	0.0092
Nitrite (as N)	mg/L	0.02-0.2 ^B 0.06-0.6 ^A	n/v	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	<0.0051	-	-	<0.0051	-	-
Total Metals									
Aluminum	mg/L	CALC ^{AB}	n/v	0.137	2.31	0.299	0.0991	0.027	2.82
Antimony	mg/L	n/v	n/v	< 0.00010	0.0002	< 0.00010	< 0.00010	< 0.00010	0.00028
Arsenic	mg/L	0.0050 ^A	n/v	0.00041	0.0072^A	0.00198	0.00045	0.0006	0.00595^A
Barium	mg/L	n/v	1 ^D	0.0119	0.0548	0.0188	0.0122	0.0205	0.159
Beryllium	mg/L	n/v	0.00013 ^D	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	0.000112
Bismuth	mg/L	n/v	n/v	< 0.000050	0.000051	< 0.000050	< 0.000050	< 0.000050	< 0.000050
Boron	mg/L	1.2 ^B	n/v	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.012
Cadmium	mg/L	CALC ^{AB}	n/v	0.0000147	0.000133	0.0000307	0.0000108	< 0.000050	0.000314
Calcium	mg/L	n/v	n/v	6.52	7.76	5.85	14.2	17.6	38.2
Cesium	mg/L	n/v	n/v	< 0.000010	0.000183	< 0.000010	< 0.000010	< 0.000010	0.00015
Chromium	mg/L	n/v	n/v	< 0.00050	0.00267	0.00065	< 0.00050	< 0.00050	0.00297
Cobalt	mg/L	0.11 ^A 0.0040 ^B	n/v	0.00016	0.0135^B	0.00258	< 0.00010	0.00037	0.00326
Copper	mg/L	BLM	n/v	0.0009	0.00836	0.00104	0.0008	< 0.00050	0.0115
Iron	mg/L	1 ^A	n/v	0.712	25.6^A	4.71^A	0.201	1.14^A	18.5^A
Lead	mg/L	0.0038-0.005 ^B 0.013-0.044 ^A	n/v	< 0.000050	0.00245	0.000149	< 0.000050	< 0.000050	0.00123
Lithium	mg/L	n/v	n/v	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010	0.0016
Magnesium	mg/L	n/v	n/v	1.89	1.94	1.63	3.79	4.46	8.87
Manganese	mg/L	0.71-0.88 ^B 0.8-1.336 ^A	n/v	0.019	2.46^{AB}	0.416	0.00736	0.0443	0.297
Mercury	mg/L	0.00001 ^B	n/v	< 0.000050	< 0.000050	0.000054	< 0.000050	< 0.000050	< 0.000050
Molybdenum	mg/L	46 ^A 7.6 ^B	n/v	0.000054	0.000797	0.000133	0.000058	0.000082	0.00072
Nickel	mg/L	n/v	0.03-0.66 ^D	0.00071	0.0042	0.00134	< 0.00050	0.00059	0.00702
Phosphorus, Total	mg/L	15 ^B	n/v	0.072	1.42	0.295	< 0.050	0.123	4.69
Potassium	mg/L	n/v	n/v	0.872	0.645	1.5	0.542	1.68	8.03
Rubidium	mg/L	n/v	n/v	0.00076	0.00208	0.00118	0.00025	0.00071	0.00253
Selenium	mg/L	0.0020 ^B	n/v	0.000071	0.000195	0.000056	0.000079	0.000097	0.000213
Silicon	mg/L	n/v	n/v	2.07	4.5	3.79	4.22	5.29	10.6
Silver	mg/L	0.00005-0.0015 ^B 0.0001-0.003 ^A	n/v	< 0.000010	0.000074^A	< 0.000010	< 0.000010	< 0.000010	0.00005
Sodium	mg/L	n/v	n/v	1.54	0.688	0.865	2.79	3.2	3.99
Strontium	mg/L	n/v	n/v	0.0433	0.0617	0.0444	0.0822	0.113	0.232
Sulfur	mg/L	n/v	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.15
Tellurium	mg/L	n/v	n/v	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020
Thallium	mg/L	n/v	0.00080 ^D	< 0.000010	0.000016	< 0.000010	< 0.000010	< 0.000010	0.000012
Thorium	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Tin	mg/L	n/v	n/v	< 0.00010	0.00017	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Titanium	mg/L	n/v	n/v	0.00143	0.0373	0.0055	0.0014	0.0006	0.0458
Tungsten	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Uranium	mg/L	n/v	0.0085 _{n7} ^D	< 0.000010	0.00006	0.000011	0.00001	< 0.000010	0.000131
Vanadium	mg/L	n/v	n/v	0.00057	0.00801	0.00138	< 0.00050	< 0.00050	0.00727
Zinc	mg/L	0.0075 ^B 0.033 ^A	n/v	< 0.0030	0.0192^B	0.0071	< 0.0030	< 0.0030	0.0574^{AB}
Zirconium	mg/L	n/v	n/v	0.00024	0.00033	0.00024	< 0.00020	< 0.00020	0.00025

See notes last page

Table 6
Summary of Surface Water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location				17-May-22 SW-01	SW-01 5-Aug-22 SW-01	12-Oct-22 SW-01	17-May-22 SW-02	SW-02 5-Aug-22 SW-02	12-Oct-22 SW-02
Sample Date				ALS VA22B1224 VA22B1224-003	ALS VA22B8570 VA22B8570-004	ALS VA22C4786 VA22C4786-001	ALS VA22B1224 VA22B1224-004	ALS VA22B8570 VA22B8570-003	ALS VA22C4786 VA22C4786-002
Sample ID									
Sampling Company									
Laboratory									
Laboratory Work Order									
Laboratory Sample ID									
Sample Type	Units	A B C BC WQG-Approved	D BC WQG-Working						
Dissolved Metals									
Aluminum	mg/L	0.05 ^B 0.1 ^A	n/v	0.104 ^{AB}	0.16 ^{AB}	0.233 ^{AB}	0.075 ^B	0.0158	0.0576 ^B
Antimony	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Arsenic	mg/L	0.0050 ^A	n/v	0.00036	0.00077	0.00174	0.00042	0.00045	0.00268
Barium	mg/L	n/v	1 ^D	0.00988	0.0118	0.017	0.0125	0.0159	0.034
Beryllium	mg/L	n/v	0.00013 ^D	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100
Bismuth	mg/L	n/v	n/v	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050	< 0.000050
Boron	mg/L	1.2 ^B	n/v	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Cadmium	mg/L	0.000074-0.00015 ^B 0.00013-0.00036 ^A	n/v	0.0000252	0.0000475	0.0000291	0.0000078	< 0.0000050	0.0000164
Calcium	mg/L	n/v	n/v	5.55	6.58	5.93	14.1	18.1	29.1
Cesium	mg/L	n/v	n/v	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010
Chromium	mg/L	n/v	n/v	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Cobalt	mg/L	0.11 ^A 0.0040 ^B	n/v	0.00016	0.00063	0.00256	0.0001	0.00023	0.00146
Copper	mg/L	BLM	n/v	0.00122	0.00184	0.00065	0.00071	0.00049	0.00074
Iron	mg/L	0.35 ^A	n/v	0.214	0.829 ^A	3.81 ^A	0.181	0.437 ^A	5.4 ^A
Lead	mg/L	CALC ^{AB}	n/v	< 0.000050	0.000066	0.000102	< 0.000050	< 0.000050	< 0.000050
Lithium	mg/L	n/v	n/v	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Magnesium	mg/L	n/v	n/v	1.56	1.57	1.66	3.81	7.96	7.96
Manganese	mg/L	n/v	n/v	0.0189	0.0917	0.406	0.0113	0.0293	0.212
Mercury	mg/L	n/v	n/v	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050
Molybdenum	mg/L	46 ^A 7.6 ^B	n/v	< 0.000050	0.000104	0.00011	< 0.000050	0.000054	0.000079
Nickel	mg/L	n/v	n ^D	0.00077	0.00114	0.00125	< 0.00050	< 0.00050	0.0014
Phosphorus	mg/L	15 ^B	n/v	< 0.050	0.075	0.194	< 0.050	0.052	1.3
Potassium	mg/L	n/v	n/v	0.739	0.517	1.55	0.57	1.23	7.49
Rubidium	mg/L	n/v	n/v	0.00062	0.00065	0.00126	0.00028	0.00049	0.00164
Selenium	mg/L	0.0020 ^B	n/v	0.000064	0.000062	0.000086	0.000067	0.000067	0.000094
Silicon	mg/L	n/v	n/v	2.48	2.15	3.48	3.77	4.64	7.35
Silver	mg/L	n/v	n/v	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010
Sodium	mg/L	n/v	n/v	1.55	0.726	0.884	2.95	2.82	3.86
Strontium	mg/L	n/v	n/v	0.0392	0.0471	0.0472	0.0801	0.12	0.178
Sulfur	mg/L	n/v	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Tellurium	mg/L	n/v	n/v	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020
Thallium	mg/L	n/v	0.00080 ^D	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010	< 0.000010
Thorium	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Tin	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Titanium	mg/L	n/v	n/v	0.00063	0.00168	0.00377	0.00108	0.00034	0.00172
Tungsten	mg/L	n/v	n/v	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Uranium	mg/L	n/v	0.0085 ₁₇ ^D	< 0.000010	< 0.000010	< 0.000010	0.000011	< 0.000010	0.000013
Vanadium	mg/L	n/v	n/v	< 0.00050	< 0.00050	0.00102	< 0.00050	< 0.00050	< 0.00050
Zinc	mg/L	n/v	n/v	0.0027	0.0075	0.0072	0.0025	0.0016	0.0081
Zirconium	mg/L	n/v	n/v	0.00027	0.00031	0.00034	0.00021	< 0.00020	< 0.00020
BTEX and PHCs									
Benzene	µg/L	40 ^B	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethylbenzene	µg/L	200 ^B	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Methyl tert-butyl ether (MTBE)	µg/L	3,400 ^A	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Styrene	µg/L	n/v	72 ^D	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	µg/L	0.5 ^B	n/v	< 0.50	< 0.50	1.57 ^B	< 0.50	< 0.50	3.69 ^B
Xylene, m & p-	µg/L	n/v	n/v	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Xylene, o-	µg/L	n/v	n/v	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Xylenes, Total	µg/L	30 ^B	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
EPH (C10-C32)	µg/L	n/v	n/v	< 400	< 400	< 400	< 400	< 400	< 400
EPH C10-C19	µg/L	n/v	n/v	< 250	< 250	< 250	< 250	< 250	< 250
EPH C19-C32	µg/L	n/v	n/v	< 250	< 250	< 250	< 250	< 250	< 250
Total Extractable Hydrocarbons	µg/L	n/v	n/v	< 250	380	< 250	< 250	< 250	480
Volatile Petroleum Hydrocarbons (VPH)	µg/L	n/v	n/v	< 100	< 100	< 100	< 100	< 100	< 100
VH (C6-C10)	µg/L	n/v	n/v	< 100	< 100	< 100	< 100	< 100	< 100

See notes last page

Table 6
Summary of Surface Water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units	A B C BC WQG-Approved	D BC WQG-Working	17-May-22	17-May-22	RPD %	SW-05	5-Aug-22	RPD %	18-Oct-22	2-Jun-22	2-Jun-22	RPD %
				SW-05	SW-21		SW-05	SW-21		SW-05	SW-07	SW-08 (DUP)	
					ALS VA22B1224 VA22B1224-001	ALS VA22B1224 VA22B1224-002	ALS VA22B8570 VA22B8570-001	ALS VA22B8570 VA22B8570-002	ALS VA22C5462 VA22C5462-003	ALS VA22B2453 VA22B2453-001	ALS VA22B2453 VA22B2453-002		
General Parameters													
pH, lab	S.U.	6.5-9 ^B	n/v	7.3	7.3	0%	7.03	7.07	1%	7.55	7.37	7.36	0%
Ammonia (as N)	mg/L	0.922 ^B	n/v	0.0091	0.008	13%	0.0152	0.0158	4%	0.0159	0.0076	0.0089	16%
Alkalinity, Total	mg/L	<20 ^A	n/v	18.4 ^A	18.6 ^A	1%	26.4	23.7	1%	37.8	24.0	24.0	1%
Electrical Conductivity, Lab	µmhos/cm	n/v	n/v	128	129	1%	168	169	1%	192	151	150	1%
Hardness (as CaCO3)	mg/L	n/v	n/v	33.6	34	1%	40	38.7	3%	49.5	39.8	38.5	3%
Nitrogen (Total)	mg/L	n/v	n/v	0.75	0.738	2%	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.658	0.75	13%	1.26	1.25	1%	1.01	0.614	0.648	5%
Chemical Oxygen Demand	mg/L	n/v	n/v	68	74	8%	101	102	1%	86	53	50	6%
Dissolved Organic Carbon (DOC)	mg/L	n/v	n/v	24.8	25.8	4%	35.6	33.2	7%	28.2	21.2	20.9	1%
Total Organic Carbon	mg/L	n/v	n/v	25	26.6	6%	31.9	33.4	5%	28.6	21.2	21.1	0%
Chloride	mg/L	600 ^A 150 ^B	n/v	25	24.9	0%	32.4	32.3	0%	34.5	28.8	29.0	1%
Sulfate	mg/L	128-429 ^B	n/v	< 0.30	< 0.30	nc	< 0.30	< 0.30	nc	< 0.30	< 0.30	< 0.30	nc
Bromide	mg/L	n/v	n/v	-	-	nc	< 0.050	< 0.050	nc	< 0.050	-	-	nc
Fluoride	mg/L	0.7-1.14 ^A	n/v	0.034	0.034	0%	0.036	0.035	3%	0.041	0.034	0.035	3%
Nitrate (as N)	mg/L	32.8 ^A 3 ^B	n/v	< 0.0050	< 0.0050	nc	< 0.0050	< 0.0050	nc	< 0.0050	< 0.0050	< 0.0050	nc
Nitrite (as N)	mg/L	0.02-0.2 ^B 0.06-0.6 ^A	n/v	< 0.0010	< 0.0010	nc	< 0.0010	< 0.0010	nc	< 0.0010	< 0.0010	< 0.0010	nc
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	< 0.0051	< 0.0051	nc	-	-	nc	-	-	-	nc
Total Metals													
Aluminum	mg/L	CALC ^{AB}	n/v	0.17	0.17	0%	0.299	0.306	2%	0.122	0.141	0.139	1%
Antimony	mg/L	n/v	n/v	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	< 0.00010	nc
Arsenic	mg/L	0.0050 ^A	n/v	0.00063	0.00056	12%	0.00109	0.00108	1%	0.00096	0.00043	0.00038	12%
Barium	mg/L	n/v	1 ^D	0.0116	0.0115	1%	0.0255	0.0282	10%	0.025	0.0165	0.0165	0%
Beryllium	mg/L	n/v	0.00013 ^D	< 0.000100	< 0.000100	nc	< 0.000100	< 0.000100	nc	< 0.000100	< 0.000100	< 0.000100	nc
Bismuth	mg/L	n/v	n/v	< 0.000050	< 0.000050	nc	< 0.000050	< 0.000050	nc	< 0.000050	< 0.000050	< 0.000050	nc
Boron	mg/L	1.2 ^B	n/v	< 0.010	< 0.010	nc	< 0.010	< 0.010	nc	< 0.010	< 0.010	< 0.010	nc
Cadmium	mg/L	CALC ^{AB}	n/v	0.0000097	0.0000064	41%	0.0000076	0.000009	17%	< 0.000050	0.0000054	< 0.000050	nc
Calcium	mg/L	n/v	n/v	10.2	10.1	1%	12.1	11.7	3%	14.8	11.8	11.1	6%
Cesium	mg/L	n/v	n/v	< 0.000010	< 0.000010	nc	0.000017	0.000018	nc	< 0.000010	< 0.000010	< 0.000010	nc
Chromium	mg/L	n/v	n/v	< 0.00050	< 0.00050	nc	0.00055	0.00057	nc	< 0.00050	< 0.00050	< 0.00050	nc
Cobalt	mg/L	0.11 ^A 0.0040 ^B	n/v	0.00015	0.00015	0%	0.00077	0.00093	19%	0.00056	< 0.00010	< 0.00010	nc
Copper	mg/L	BLM	n/v	0.00103	0.00103	0%	0.00081	0.00083	2%	0.00055	0.00147	0.00145	1%
Iron	mg/L	1 ^A	n/v	0.386	0.384	1%	1.86 ^A	2.14 ^A	14%	0.94	0.175	0.171	2%
Lead	mg/L	0.0038-0.005 ^B 0.013-0.044 ^A	n/v	< 0.000050	< 0.000050	nc	0.000284	0.00029	nc	0.000083	< 0.000050	< 0.000050	nc
Lithium	mg/L	n/v	n/v	< 0.0010	< 0.0010	nc	< 0.0010	< 0.0010	nc	< 0.0010	< 0.0010	< 0.0010	nc
Magnesium	mg/L	n/v	n/v	2.18	2.17	0%	2.39	2.3	4%	3.05	2.58	2.62	2%
Manganese	mg/L	0.71-0.88 ^B 0.8-1.336 ^A	n/v	0.0319	0.029	10%	0.195	0.227	15%	0.23	0.00940	0.00866	8%
Mercury	mg/L	0.00001 ^B	n/v	< 0.0000050	< 0.0000050	nc	< 0.000050	< 0.000050	nc	< 0.000050	< 0.000050	< 0.000050	nc
Molybdenum	mg/L	46 ^A 7.6 ^B	n/v	< 0.000050	< 0.000050	nc	0.000051	0.000073	nc	< 0.000050	< 0.000050	0.000050	nc
Nickel	mg/L	n/v	0.03-0.66 ^D	0.00082	0.0008	2%	0.00124	0.00134	8%	0.00076	0.00077	0.00079	3%
Phosphorus, Total	mg/L	15 ^B	n/v	< 0.050	< 0.050	nc	0.087	0.083	nc	< 0.050	< 0.050	< 0.050	nc
Potassium	mg/L	n/v	n/v	0.339	0.277	3%	0.277	0.289	4%	0.962	0.805	0.804	0%
Rubidium	mg/L	n/v	n/v	0.00028	0.00026	7%	0.00029	0.00032	10%	0.00066	0.00043	0.00049	13%
Selenium	mg/L	0.0020 ^B	n/v	0.00007	0.00007	0%	0.000066	0.000088	29%	0.000054	0.000051	< 0.000050	nc
Silicon	mg/L	n/v	n/v	0.71	0.73	3%	2.03	1.99	2%	1.73	1.940	1.90	2%
Silver	mg/L	0.00005-0.0015 ^B 0.0001-0.003 ^A	n/v	< 0.000010	< 0.000010	nc	< 0.000010	< 0.000010	nc	< 0.000010	< 0.000010	< 0.000010	nc
Sodium	mg/L	n/v	n/v	13.1	13	1%	18.1	17.2	5%	23.2	14.2	14.4	1%
Strontium	mg/L	n/v	n/v	0.0653	0.0645	1%	0.0914	0.0911	0%	0.121	0.0771	0.0775	1%
Sulfur	mg/L	n/v	n/v	< 0.50	< 0.50	nc	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc
Tellurium	mg/L	n/v	n/v	< 0.00020	< 0.00020	nc	< 0.00020	< 0.00020	nc	< 0.00020	< 0.00020	< 0.00020	nc
Thallium	mg/L	n/v	0.00080 ^D	< 0.000010	< 0.000010	nc	< 0.000010	< 0.000010	nc	< 0.000010	< 0.000010	< 0.000010	nc
Thorium	mg/L	n/v	n/v	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	< 0.00010	nc
Tin	mg/L	n/v	n/v	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	< 0.00010	nc
Titanium	mg/L	n/v	n/v	0.00112	0.00104	7%	0.00311	0.00284	9%	0.00113	0.00080	0.00089	11%
Tungsten	mg/L	n/v	n/v	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	nc	< 0.00010	< 0.00010	< 0.00010	nc
Uranium	mg/L	n/v	0.0085 _{n7} ^D	< 0.000010	< 0.000010	nc	< 0.000010	0.000011	nc	< 0.000010	< 0.000010	< 0.000010	nc
Vanadium	mg/L	n/v	n/v	< 0.00050	< 0.00050	nc	< 0.00082	0.00091	nc	< 0.00050	< 0.00050	< 0.00050	nc
Zinc	mg/L	0.0075 ^B 0.033 ^A	n/v	0.0052	0.0053	2%	0.0058	0.0052	11%	0.0035	< 0.0030	< 0.0030	nc
Zirconium	mg/L	n/v	n/v	0.00027	0.00026	4%	< 0.00020	< 0.00020	nc	< 0.00020	0.00027	0.00027	0%

See notes last page

Table 6
Summary of Surface Water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units			SW-09				RPD %
		A B C BC WQG-Approved	D BC WQG-Working	2-Jun-22 SW-09 ALS VA22B2453 VA22B2453-003	5-Aug-22 SW-09 ALS VA22B8570 VA22B8570-005	18-Oct-22 SW-09 ALS VA22C5462 VA22C5462-001	18-Oct-22 SW-21 ALS VA22C5462 VA22C5462-002	
General Parameters								
pH, lab	S.U.	6.5-9 ^B	n/v	8.59	8.48	8.51	8.51	0%
Ammonia (as N)	mg/L	0.922 ^B	n/v	0.0269	0.0256	0.0292	0.0255	14%
Alkalinity, Total	mg/L	<20 ^A	n/v	272	342	314	311	1%
Electrical Conductivity, Lab	µmhos/cm	n/v	n/v	631	757	782	777	1%
Hardness (as CaCO3)	mg/L	n/v	n/v	260	281	312	318	2%
Nitrogen (Total)	mg/L	n/v	n/v	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	n/v	n/v	0.782	1.17	0.814	1.01	21%
Chemical Oxygen Demand	mg/L	n/v	n/v	33	52	57	52	9%
Dissolved Organic Carbon (DOC)	mg/L	n ^B	n/v	12.0	17.1	13.3	14.4	8%
Total Organic Carbon	mg/L	n ^B	n/v	12.3	20	15.3	17.2	12%
Chloride	mg/L	600 ^A 150 ^B	n/v	47.1	67.4	76.2	76.4	0%
Sulfate	mg/L	128-429 ^B	n/v	3.64	< 1.50	<,DLDS 1.50	<,DLDS 1.50	nc
Bromide	mg/L	n/v	n/v	<0.250	<0.250	<,DLDS 0.250	<,DLDS 0.250	nc
Fluoride	mg/L	0.7-1.14 ^A	n/v	<0.100	<S 0.100	<,DLDS 0.100	<,DLDS 0.100	nc
Nitrate (as N)	mg/L	32.8 ^A 3 ^B	n/v	0.497	0.516	0.217	0.213	2%
Nitrite (as N)	mg/L	0.02-0.2 ^B 0.06-0.6 ^A	n/v	<0.0050	<0.0050	<,DLDS 0.0050	<,DLDS 0.0050	nc
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	-	-	-	-	nc
Total Metals								
Aluminum	mg/L	calc ^{AB}	n/v	0.0186	0.0171	0.15	0.16	6%
Antimony	mg/L	n/v	n/v	0.00017	0.00021	0.00012	0.00011	9%
Arsenic	mg/L	0.0050 ^A	n/v	0.00085	0.00144	0.00097	0.00105	8%
Barium	mg/L	n/v	1 ^D	0.0568	0.0446	0.0591	0.0623	5%
Beryllium	mg/L	n/v	0.00013 ^D	<0.000100	<0.000100	<0.000100	<0.000100	nc
Bismuth	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc
Boron	mg/L	1.2 ^B	n/v	0.356	0.416	0.339	0.327	4%
Cadmium	mg/L	calc ^{AB}	n/v	<0.0000050	<0.0000050	0.0000128	0.0000088	37%
Calcium	mg/L	n/v	n/v	68.3	79.3	87.8	88.9	1%
Cesium	mg/L	n/v	n/v	<0.000010	<0.000010	0.000012	0.000012	0%
Chromium	mg/L	n/v	n/v	<0.00050	<0.00050	<0.00050	<0.00050	nc
Cobalt	mg/L	0.11 ^A 0.0040 ^B	n/v	0.00020	0.00025	0.00026	0.00027	4%
Copper	mg/L	BLM	n/v	0.00064	<0.00050	0.00084	0.00085	1%
Iron	mg/L	1 ^A	n/v	0.032	0.03	0.158	0.165	4%
Lead	mg/L	0.0038-0.005 ^B 0.013-0.044 ^A	n/v	<0.000050	<0.000050	0.000059	<0.000050	nc
Lithium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc
Magnesium	mg/L	n/v	n/v	17.4	20.1	22.6	23.4	3%
Manganese	mg/L	0.71-0.88 ^B 0.8-1.336 ^A	n/v	0.0366	0.0243	0.205	0.221	8%
Mercury	mg/L	0.00001 ^B	n/v	<0.0000050	<0.0000050	<0.0000050	<0.0000050	nc
Molybdenum	mg/L	46 ^A 7.6 ^B	n/v	0.000653	0.00112	0.000688	0.000692	1%
Nickel	mg/L	n/v	0.03-0.66 ^D	0.00301	0.00459	0.0041	0.00426	4%
Phosphorus, Total	mg/L	15 ^B	n/v	<0.050	0.06	0.066	0.068	3%
Potassium	mg/L	n/v	n/v	10.0	11.2	10.6	10.9	3%
Rubidium	mg/L	n/v	n/v	0.00161	0.00206	0.00181	0.00198	9%
Selenium	mg/L	0.0020 ^B	n/v	0.000077	0.000107	0.000079	0.000125	45%
Silicon	mg/L	n/v	n/v	1.270	5.94	4.92	4.88	1%
Silver	mg/L	0.00005-0.0015 ^B 0.0001-0.003 ^A	n/v	<0.000010	<0.000010	<0.000010	<0.000010	nc
Sodium	mg/L	n/v	n/v	43.4	56.1	59.7	61.5	3%
Strontium	mg/L	n/v	n/v	0.459	0.567	0.595	0.596	0%
Sulfur	mg/L	n/v	n/v	2.11	0.57	<0.50	<0.50	nc
Tellurium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	nc
Thallium	mg/L	n/v	0.00080 ^D	<0.000010	<0.000010	<0.000010	<0.000010	nc
Thorium	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Tin	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Titanium	mg/L	n/v	n/v	<0.00030	<0.00030	0.00171	0.00176	3%
Tungsten	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Uranium	mg/L	n/v	0.0085 _{n7} ^D	0.000337	0.000356	0.000854	0.000872	2%
Vanadium	mg/L	n/v	n/v	<0.00050	<0.00050	<0.00050	<0.00050	nc
Zinc	mg/L	0.0075 ^B 0.033 ^A	n/v	<0.0030	<0.0030	<0.0030	<0.0030	nc
Zirconium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	nc

See notes last page

Table 6
Summary of Surface Water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Location Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units			SW-09				RPD %
		A B C BC WQG-Approved	D BC WQG-Working	2-Jun-22 SW-09 ALS VA22B2453 VA22B2453-003	5-Aug-22 SW-09 ALS VA22B8570 VA22B8570-005	18-Oct-22 SW-09 ALS VA22C5462 VA22C5462-001	18-Oct-22 SW-21 ALS VA22C5462 VA22C5462-002	
Dissolved Metals								
Aluminum	mg/L	0.05 ^B 0.1 ^A	n/v	0.0118	0.0135	0.0157	0.0118	28%
Antimony	mg/L	n/v	n/v	0.00015	0.00022	0.00011	0.0001	10%
Arsenic	mg/L	0.0050 ^A	n/v	0.00083	0.00163	0.00093	0.00096	3%
Barium	mg/L	n/v	1 ^D	0.0486	0.0486	0.0567	0.0554	2%
Beryllium	mg/L	n/v	0.00013 ^D	<0.000100	<0.000100	<0.000100	<0.000100	nc
Bismuth	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc
Boron	mg/L	1.2 ^B	n/v	0.377	0.47	0.316	0.32	1%
Cadmium	mg/L	0.000074-0.00015 ^B 0.00013-0.00036 ^A	n/v	<0.000050	0.000056	<0.000050	<0.000050	nc
Calcium	mg/L	n/v	n/v	75.0	84.9	82.2	84	2%
Cesium	mg/L	n/v	n/v	<0.000010	<0.000010	<0.000010	<0.000010	nc
Chromium	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc
Cobalt	mg/L	0.11 ^A 0.0040 ^B	n/v	0.00019	0.00025	0.00015	0.00016	6%
Copper	mg/L	BLM	n/v	0.00058	0.00056	0.00049	0.00052	6%
Iron	mg/L	0.35 ^A	n/v	0.018	0.023	0.011	0.011	0%
Lead	mg/L	CALC ^{AB}	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc
Lithium	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc
Magnesium	mg/L	n/v	n/v	17.6	21.4	21	21.1	0%
Manganese	mg/L	n/v	n/v	0.0213	0.0238	0.0526	0.0527	0%
Mercury	mg/L	n/v	n/v	<0.0000050	<0.0000050	<0.0000050	<0.0000050	nc
Molybdenum	mg/L	46 ^A 7.6 ^B	n/v	0.000653	0.00116	0.0007	0.000638	9%
Nickel	mg/L	n/v	n ^D	0.00285	0.00479	0.00378	0.00382	1%
Phosphorus	mg/L	15 ^B	n/v	<0.050	0.073	<0.050	<0.050	nc
Potassium	mg/L	n/v	n/v	8.62	11.4	9.96	9.76	2%
Rubidium	mg/L	n/v	n/v	0.00147	0.00232	0.00186	0.00184	1%
Selenium	mg/L	0.0020 ^B	n/v	0.000066	0.000068	0.000077	0.000103	29%
Silicon	mg/L	n/v	n/v	1.190	5.88	4.72	4.76	1%
Silver	mg/L	n/v	n/v	<0.000010	<0.000010	<0.000010	<0.000010	nc
Sodium	mg/L	n/v	n/v	44.5	60.7	58.2	58.1	0%
Strontium	mg/L	n/v	n/v	0.505	0.6	0.581	0.566	3%
Sulfur	mg/L	n/v	n/v	1.94	0.76	<0.50	<0.50	nc
Tellurium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	nc
Thallium	mg/L	n/v	0.00080 ^D	<0.000010	<0.000010	<0.000010	<0.000010	nc
Thorium	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Tin	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Titanium	mg/L	n/v	n/v	<0.00030	<0.00030	<0.00030	<0.00030	nc
Tungsten	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc
Uranium	mg/L	n/v	0.0085 ₁₇ ^D	0.000409	0.000352	0.000748	0.000765	2%
Vanadium	mg/L	n/v	n/v	<0.00050	<0.00050	<0.00050	<0.00050	nc
Zinc	mg/L	n/v	n/v	<0.0010	0.001	<0.0010	<0.0010	nc
Zirconium	mg/L	n/v	n/v	<0.00020	<0.00020	<0.00020	<0.00020	nc
BTEX and PHCs								
Benzene	µg/L	40 ^B	n/v	<0.50	<0.50	<0.50	<0.50	nc
Ethylbenzene	µg/L	200 ^B	n/v	<0.50	<0.50	<0.50	<0.50	nc
Methyl tert-butyl ether (MTBE)	µg/L	3,400 ^A	n/v	<0.50	<0.50	<0.50	<0.50	nc
Styrene	µg/L	n/v	72 ^D	<0.50	<0.50	<0.50	<0.50	nc
Toluene	µg/L	0.5 ^B	n/v	<0.50	<0.50	<0.50	<0.50	nc
Xylene, m & p-	µg/L	n/v	n/v	<0.40	<0.40	<0.40	<0.40	nc
Xylene, o-	µg/L	n/v	n/v	<0.30	<0.30	<0.30	<0.30	nc
Xylenes, Total	µg/L	30 ^B	n/v	<0.61	<0.50	<0.50	<0.50	nc
EPH (C10-C32)	µg/L	n/v	n/v	<400	<400	<400	<400	nc
EPH C10-C19	µg/L	n/v	n/v	<250	<250	<250	<250	nc
EPH C19-C32	µg/L	n/v	n/v	<250	<250	<250	<250	nc
Total Extractable Hydrocarbons	µg/L	n/v	n/v	-	<250	<250	<250	nc
Volatile Petroleum Hydrocarbons (VPH)	µg/L	n/v	n/v	<100	<100	<100	<100	nc
VH (C6-C10)	µg/L	n/v	n/v	<100	<100	<100	<100	nc

See notes last page

Table 6
Summary of Surface water Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Notes:

BC WQG-Approved	British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (Aug 2019)
^A	Approved Water Quality Guidelines - Short-Term Acute (Freshwater Aquatic Life)
^B	Approved Water Quality Guidelines - Long-Term Chronic (Freshwater Aquatic Life)
^C	Approved Water Quality Guidelines - Long-Term Chronic (Freshwater Aquatic Life)-Phototoxic
BC WQG-Working	British Columbia Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (June 2017)
^D	Working Water Quality Guidelines - Freshwater aquatic life
6.5^A	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
^{AB} CALC	Guideline to be calculated. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
^{AB} LOOKUP	Guideline is a lookup value. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
^{AB} LOOKUP/CALC	Guideline is a lookup and calculation. For further information please reference [British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, August 2019].
n1	Long-term median within 20% of background median
n7	Guideline was developed by CCME using the species sensitivity distribution (SSD) method. This method has not been adopted by BC and therefore the lower fiducial limit of the SSD 5th percentile is adopted as the BC WWQG.
n9	To calculate the WWQG for nickel at hardness >60 to <180 mg/L use the equation: $WWQG (\mu\text{g/L}) = e^{0.76[\ln(\text{hardness})] + 1.06}$; where hardness is in mg/L CaCO ₃ .

Table 7
Summary of Leachate Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Date			19-Jan-22	30-Mar-22	19-Jan-22	30-Mar-22	6-Jul-22	18-Aug-22	11-Oct-22	11-Oct-22		30-Mar-22	12-Jul-22	12-Jul-22		11-Oct-22
Sample ID			Facility 1	Facility 1	Wetland 4 @ Outlet	Wetland 4 @ Outlet	Wetland 4 @ Outlet	Wetland 4 @ Outlet	Wetland 4 @ Weir	Wetland 2		Post Sand Filter / Pre Phyto	Treated Leachate to Phyto	SW-21		Pre Phyto Post Sand Filter
Sampling Company			RDKS	RDKS	RDKS	RDKS	RDKS	RDKS	RDKS	RDKS		RDKS	RDKS	RDKS		RDKS
Laboratory			ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS		ALS	ALS	ALS		ALS
Laboratory Work Order			VA22A1147	VA22A6759	VA22A1147	VA22A6759	VA22B5770	VA22B9557	VA22C4642	VA22C4642		VA22A6759	VA22B6058	VA22B6058		VA22C4642
Laboratory Sample ID			VA22A1147-002	VA22A6759-002	VA22A1147-001	VA22A6759-001	VA22B5770-001	VA22B9557-002	VA22C4642-001	VA22C4642-002		VA22A6759-005	VA22B6058-001	VA22B6058-002		VA22C4642-003
Sample Type	Units	OC Criteria								Field Duplicate	RPD %			Field Duplicate	RPD %	
General Parameters																
pH, lab	S.U.	6.5- 8.5 ^A	7.84	8.06	7.8	8.06	8.32	8.44	8.4	8.39	0%	7.9	8.39	8.37	0%	8.3
Ammonia (as N)	mg/L	30 ^A	12.2	3.42	12.2	3.49	1.32	0.595	0.0393	0.0378	4%	9.43	5.14	4.83	6%	3.73
Alkalinity, Total	mg/L	n/v	558	289	568	289	322	319	297	280	6%	302	407	394	3%	256
Hardness (as CaCO3)	mg/L	n/v	497	235	491	238	293	520	244	248	2%	336	324	330	2%	314
Electrical Conductivity, Lab	µmhos/cm	n/v	1290	623	1290	625	752	799	693	700	1%	675	908	903	1%	755
Orthophosphate (as P)	mg/L	n/v	0.0011	0.004	0.0019	0.0044	0.0055	0.0021	0.0012	< 0.0010	nc	0.0018	0.0045	0.002	nc	0.0041
Nitrogen (Total)	mg/L	n/v	13.7	4.57	13.6	4.61	2.46	2.03	1.2	1.18	2%	10.4	6.63	6.68	1%	4.81
Total Kjeldahl Nitrogen	mg/L	n/v	15.2	4.05	14.8	4.04	2.92	1.89	1.13	1.17	3%	9.65	6.34	6.45	2%	4.76
Biochemical Oxygen Demand (BOD)	mg/L	n/v	50.8	< 2.0	44	< 2.0	2.8	5	3.9	4.2	7%	7.6	4	4.3	7%	<6.0
Carbonaceous BOD - 5 Day	mg/L	n/v	-	-	-	-	3.6	-	-	-	nc	-	-	-	nc	-
Chemical Oxygen Demand	mg/L	n/v	181	34	175	56	62	50	48	44	9%	101	56	55	2%	48
Dissolved Organic Carbon (DOC)	mg/L	n/v	-	9.98	-	9.44	15.3	18.1	13.3	13.2	1%	21.7	16	17.2	7%	14.9
Total Organic Carbon	mg/L	n/v	58.3	10.2	55.1	9.53	15.5	20.3	14.2	16.2	13%	24.9	16.9	17.7	5%	14.9
Chloride	mg/L	3750 ^A	90.2	32.4	91.0	32.4	64.2	72.3	77.7	77.6	0%	38.6	66.9	67.1	0%	82.9
Sulfate	mg/L	n/v	2.66	8.36	2.72	8.36	< 1.50	< 1.50	1.72	1.62	6%	13.6	2.59	2.81	8%	7.9
Bromide	mg/L	n/v	-	-	-	-	< 0.250	< 0.250	< 0.250	< 0.250	nc	-	< 0.250	< 0.250	nc	< 0.250
Fluoride	mg/L	n/v	< 0.100	0.091	< 0.100	0.091	< 0.100	< 0.100	< 0.100	< 0.100	nc	< 0.100	< 0.100	< 0.100	nc	< 0.100
Nitrate (as N)	mg/L	n/v	< 0.0250	0.213	< 0.0250	0.216	0.167	0.0892	0.112	0.107	5%	0.0266	0.432	0.436	1%	0.0337
Nitrite (as N)	mg/L	n/v	< 0.0050	0.0216	< 0.0050	0.0217	0.0282	0.0335	< 0.0050	< 0.0050	nc	< 0.0050	0.0062	< 0.0050	nc	< 0.0050
BTEX and PHCs																
Benzene	µg/L	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc	< 0.50
Ethylbenzene	µg/L	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc	< 0.50
Methyl tert-butyl ether (MTBE)	µg/L	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc	< 0.50
Styrene	µg/L	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc	< 0.50
Toluene	µg/L	n/v	10.4	< 0.50	10.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	4.49	1.71	1.43	18%	< 0.50
Xylene, m & p-	µg/L	n/v	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	nc	< 0.40	< 0.40	< 0.40	nc	< 0.40
Xylene, o-	µg/L	n/v	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	nc	< 0.30	< 0.30	< 0.30	nc	< 0.30
Xylenes, Total	µg/L	n/v	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	nc	< 0.50	< 0.50	< 0.50	nc	< 0.50
EPH (C10-C32)	µg/L	n/v	< 400	-	-	-	< 400	< 400	< 400	< 400	nc	-	< 400	< 400	nc	< 400
EPH C10-C19	µg/L	n/v	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	nc	< 250	< 250	< 250	nc	< 250
EPH C19-C32	µg/L	n/v	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	nc	< 250	< 250	< 250	nc	< 250
Total Extractable Hydrocarbons	µg/L	n/v	-	-	-	-	< 250	< 250	< 250	< 250	nc	-	< 250	< 250	nc	< 250
Volatile Petroleum Hydrocarbons (VPH)	µg/L	n/v	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	nc	< 100	< 100	< 100	nc	< 100
VH (C6-C10)	µg/L	n/v	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	nc	< 100	< 100	< 100	nc	< 100

See notes last page

Table 7
Summary of Leachate Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Sample Date			19-Jan-22 Facility 1 RDKS ALS VA22A1147	30-Mar-22 Facility 1 RDKS ALS VA22A6759	19-Jan-22 Wetland 4 @ Outlet RDKS ALS VA22A1147-001	30-Mar-22 Wetland 4 @ Outlet RDKS ALS VA22A6759-001	6-Jul-22 Wetland 4 @ Outlet RDKS ALS VA22B5770	18-Aug-22 Wetland 4 @ Outlet RDKS ALS VA22B9557	11-Oct-22 Wetland 4 @ Weir RDKS ALS VA22C4642	11-Oct-22 Wetland 2 RDKS ALS VA22C4642-002 Field Duplicate	RPD %	30-Mar-22 Post Sand Filter / Pre Phyto RDKS ALS VA22A6759-005	12-Jul-22 Treated Leachate to Phyto RDKS ALS VA22B6058-001	12-Jul-22 SW-21 RDKS ALS VA22B6058-002 Field Duplicate	RPD %	11-Oct-22 Pre Phyto Post Sand Filter RDKS ALS VA22C4642-003
Sample ID	Units	A OC Criteria														
Total Metals																
Aluminum	mg/L	n/v	0.0653	0.056	0.0682	0.0605	0.0282	0.668	0.013	0.0147	12%	0.0419	0.0348	0.0395	13%	0.0154
Antimony	mg/L	n/v	0.00061	0.00023	0.0006	0.00023	0.00039	0.00086	0.00024	0.00025	4%	0.00032	0.00048	0.00046	4%	0.00026
Arsenic	mg/L	n/v	0.0139	0.00237	0.0128	0.00246	0.00842	0.0104	0.00364	0.00363	0%	0.024	0.0234	0.0233	0%	0.00438
Barium	mg/L	n/v	0.318	0.0967	0.308	0.0937	0.0775	0.262	0.0534	0.0546	2%	0.196	0.147	0.147	0%	0.132
Beryllium	mg/L	n/v	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	< 0.000100	nc	< 0.000100	< 0.000100	< 0.000100	nc	< 0.000100
Bismuth	mg/L	n/v	< 0.000250	< 0.000050	< 0.000250	< 0.000050	< 0.000050	0.000381	< 0.000050	< 0.000050	nc	< 0.000100	< 0.000100	< 0.000100	nc	< 0.000050
Boron	mg/L	n/v	0.67	0.33	0.664	0.327	0.528	1	0.58	0.597	3%	0.532	0.551	0.525	5%	0.625
Cadmium	mg/L	0.1 ^A	0.0000497	0.0000139	0.0000398	0.0000119	0.0000108	0.000135	< 0.000050	0.000088	nc	0.0000264	0.0000221	0.0000184	18%	0.0000378
Calcium	mg/L	n/v	145	68.2	144	68.4	82.2	145	62.3	64.4	3%	96.4	92.7	95.6	3%	91.9
Cesium	mg/L	n/v	< 0.000050	0.000022	< 0.000050	0.000023	0.000033	0.000103	< 0.000010	0.00001	nc	0.000028	0.000022	< 0.000020	nc	0.000043
Chromium	mg/L	n/v	0.00196	< 0.00050	0.00189	< 0.00050	0.0006	0.00669	< 0.00050	< 0.00050	nc	0.00109	0.00079	0.00082	4%	< 0.00050
Cobalt	mg/L	n/v	0.00547	0.00147	0.00527	0.0015	0.00079	0.0098	0.00036	0.00037	3%	0.00543	0.00158	0.00157	1%	0.00106
Copper	mg/L	n/v	< 0.00250	0.0008	< 0.00250	0.00084	0.00063	0.01	0.00096	0.00089	8%	< 0.00100	< 0.00100	< 0.00100	nc	0.00161
Iron	mg/L	4.5 ^A	4.77 ^A	0.353	4.42	0.36	0.684	0.224	0.22	0.224	1%	10.5 ^A	1.93 ^A	1.94 ^A	1%	0.469
Lead	mg/L	n/v	< 0.000250	< 0.000050	< 0.000250	< 0.000050	0.00005	0.00261	< 0.000050	< 0.000050	nc	0.000214	< 0.000100	< 0.000100	nc	0.000064
Lithium	mg/L	n/v	< 0.0050	< 0.0010	< 0.0050	< 0.0010	< 0.0010	0.0028	< 0.0010	< 0.0010	1%	< 0.0020	< 0.0020	< 0.0020	nc	< 0.0010
Magnesium	mg/L	n/v	32.7	15.7	31.9	16.2	21.3	38.4	21.5	21.3	1%	23.2	22.4	22.3	0%	20.6
Manganese	mg/L	n/v	12.4	1.41	12.1	1.43	1.38	3.76	0.224	0.237	6%	8	5.25	5.3	1%	2.54
Mercury	mg/L	n/v	0.0000058	< 0.0000050	0.0000097	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	< 0.0000050	nc	0.0000066	< 0.0000050	< 0.0000050	nc	0.0000079
Molybdenum	mg/L	n/v	0.00106	0.000914	0.00112	0.000902	0.0017	0.00148	0.000888	0.000882	1%	0.0017	0.00348	0.00306	13%	0.00214
Nickel	mg/L	n/v	0.00885	0.00354	0.00847	0.00344	0.00503	0.0184	0.0049	0.00489	0%	0.00472	0.00562	0.00556	1%	0.00594
Phosphorus, Total	mg/L	n/v	< 0.250	< 0.050	< 0.250	< 0.050	0.051	2.28	< 0.050	< 0.050	nc	0.217	< 0.100	< 0.100	nc	< 0.050
Potassium	mg/L	n/v	17.8	7.89	17.1	7.66	13.3	36.1	10.2	10.3	1%	12.7	15.2	15.5	2%	11.3
Rubidium	mg/L	n/v	0.00401	0.00142	0.00374	0.00134	0.00238	0.0112	0.00112	0.00127	13%	0.00134	0.0016	0.00147	8%	0.00194
Selenium	mg/L	n/v	< 0.000250	0.000058	< 0.000250	0.000086	0.000088	0.000348	0.000068	0.000067	1%	0.000102	< 0.000100	< 0.000100	nc	< 0.000050
Silicon	mg/L	n/v	7.1	3.82	6.78	3.85	4.72	8.96	4.89	4.85	1%	7.31	6.77	6.75	0%	4.52
Silver	mg/L	n/v	< 0.000050	< 0.000010	< 0.000050	< 0.000010	< 0.000010	0.000016	< 0.000010	< 0.000010	nc	< 0.000020	< 0.000020	< 0.000020	nc	< 0.000010
Sodium	mg/L	n/v	84.9	31.8	82.2	32.3	61.5	124	66.6	68.3	3%	52.6	63.4	62.7	1%	71.8
Strontium	mg/L	n/v	0.953	0.442	0.942	0.43	0.607	1.02	0.518	0.508	2%	0.683	0.618	0.588	5%	0.638
Sulfur	mg/L	n/v	< 2.50	3.58	< 2.50	3.55	0.83	16	0.98	1.04	6%	3.34	2.41	2.3	5%	4.2
Tellurium	mg/L	n/v	< 0.00100	< 0.00020	< 0.00100	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	nc	< 0.00040	< 0.00040	< 0.00040	nc	< 0.00020
Thallium	mg/L	n/v	< 0.000050	< 0.000010	< 0.000050	< 0.000010	< 0.000010	0.000017	< 0.000010	< 0.000010	nc	< 0.000020	< 0.000020	< 0.000020	nc	< 0.000010
Thorium	mg/L	n/v	< 0.00050	< 0.00010	< 0.00050	< 0.00010	< 0.00010	0.00011	< 0.00010	< 0.00010	nc	< 0.00020	< 0.00020	< 0.00020	nc	< 0.00010
Tin	mg/L	n/v	< 0.00050	< 0.00010	< 0.00050	< 0.00010	< 0.00010	0.00045	< 0.00010	< 0.00010	nc	< 0.00020	< 0.00020	< 0.00020	nc	< 0.00010
Titanium	mg/L	n/v	0.00183	0.0011	0.00199	0.00053	0.00587	< 0.00030	< 0.00030	< 0.00030	nc	0.00154	< 0.00060	0.00062	nc	< 0.00030
Tungsten	mg/L	n/v	< 0.00050	< 0.00010	< 0.00050	< 0.00010	< 0.00010	0.00018	< 0.00010	< 0.00010	nc	< 0.00020	< 0.00020	< 0.00020	nc	< 0.00010
Uranium	mg/L	n/v	0.000345	0.000287	0.00034	0.000286	0.000246	0.000299	0.00033	0.000342	4%	0.000233	0.000492	0.000474	4%	0.0006
Vanadium	mg/L	n/v	< 0.00250	< 0.00050	< 0.00250	< 0.00050	< 0.00050	0.0054	< 0.00050	< 0.00050	nc	0.00195	< 0.00100	< 0.00100	nc	< 0.00050
Zinc	mg/L	75 ^A	< 0.0150	< 0.0030	< 0.0150	< 0.0030	< 0.0030	0.0783	< 0.0030	< 0.0030	nc	0.0481	< 0.0060	< 0.0060	nc	0.0102
Zirconium	mg/L	n/v	< 0.00100	< 0.00020	< 0.00100	< 0.00020	< 0.00020	0.00028	< 0.00020	< 0.00020	nc	< 0.00040	< 0.00040	< 0.00040	nc	< 0.00020

See notes last page

Table 7
Summary of Leachate Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Notes:

OC Criteria	Operational Criteria for Hazelton Landfill
A	OC Criteria
6.5 ^A	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.

Table 8
Summary of Phytoremediation Orchard Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Location Sort			
Sample Location			30-Mar-22
Sample Date			
Sample ID			Composite soil sample
Sampling Company			
Laboratory			ALS
Laboratory Work Order			VA22A6757
Laboratory Sample ID			VA22A6757-001
Sample Type	Units	A B C D E F CSR-Schedule 3.1-IL	
General Parameters			
Percent Saturation	%	n/v	41.3
Soluble (1:2) pH	S.U.	n/v	7.23
Sodium Ion (Na+)	mg/kg	N9 ^A 15,000 ^B 1,000,000 ^C 1,000 ^D	5.37
Moisture Content	%	n/v	22.3
Bromide	mg/kg	n/v	< 0.50
Chloride	mg/kg	600 ^{N3} 100 ^{N3} 1,000,000 ^{N3} 2,500 ^{N3}	12.0
Chloride	mg/L	n/v	29
Chloride	mg/kg	600 ^{N3} 100 ^{N3} 1,000,000 ^{N3} 2,500 ^{N3}	< 20.0
Nitrate	mg/kg	400,000 ^E	0.137
Nitrite	mg/kg	25,000 ^E	0.026
Sulfate	mg/kg	n/v	< 10
Sodium Ion (Na+)	mg/L	n/v	13.0
% Clay (<2um)	%	n/v	23.9
% Sand (2.0mm - 0.05mm)	%	n/v	49.9
% Silt (0.05mm - 2um)	%	n/v	26.2
Texture	none	n/v	0
Total Metals			
Aluminum	mg/kg	250,000 ^E	26800
Antimony	mg/kg	40,000 ^E 40 ^F	0.65
Arsenic	mg/kg	10 ^{AB} 400 ^C 40 ^D	13.8 ^A
Barium	mg/kg	3,500 ^A 350 ^B 1,000,000 ^C 1,500 ^D	196
Beryllium	mg/kg	1.0/500 ^{PH2} 1.0/2,500 ^{PH1} 15,000 ^C 350 ^D	0.52
Bismuth	mg/kg	n/v	< 0.20
Boron	mg/kg	1,000,000 ^E	< 5.0
Cadmium	mg/kg	1.0/50 ^{PH7} 1.0/70 ^{PH6} 3,500 ^C 75 ^D	0.168
Calcium	mg/kg	n/v	5800
Chromium	mg/kg	60/300,000 ^{N5,N6} 60/1,000,000 ^{N5,N6} 20,000 ^{N4} 250 ^{N4}	30.0
Cobalt	mg/kg	25 ^{AB} 2,000 ^C 200 ^D	13.5
Copper	mg/kg	75/7,500 ^{PH32} 250/100,000 ^{PH30} 700,000 ^C 300 ^D	40.5
Iron	mg/kg	150,000 ^E	38500
Lead	mg/kg	200/90,000 ^{PH12} 120/8,500 ^{PH11} 4,000 ^C 1,000 ^D	8.68
Lithium	mg/kg	450 ^E	18.8
Magnesium	mg/kg	n/v	8010
Manganese	mg/kg	2,000 ^{BD} 1,000,000 ^C	1000
Mercury	mg/kg	2,000 ^C 75 ^D	0.0503
Molybdenum	mg/kg	650 ^A 15 ^B 35,000 ^C 150 ^D	0.80
Nickel	mg/kg	90/9,500 ^{PH17} 70/500 ^{PH16} 80,000 ^C 250 ^D	33.4
Phosphorus, Total	mg/kg	n/v	837
Potassium	mg/kg	n/v	1280
Selenium	mg/kg	1.0 ^A 1.0 ^{N2} 35,000 ^C 2.0 ^D	0.22
Silver	mg/kg	35,000 ^E 40 ^F	0.18
Sodium	mg/kg	N9 ^A 15,000 ^B 1,000,000 ^C 1,000 ^D	225
Strontium	mg/kg	150,000 ^E	43.5
Sulfur	mg/kg	n/v	< 1000
Thallium	mg/kg	25 ^F	0.090
Tin	mg/kg	1,000,000 ^E 300 ^F	< 2.0
Titanium	mg/kg	n/v	454
Tungsten	mg/kg	200 ^E	< 0.50
Uranium	mg/kg	150 ^A 30 ^B 20,000 ^C 2,000 ^D	0.456
Vanadium	mg/kg	100 ^B 35,000 ^C 300 ^D	63.9
Zinc	mg/kg	150/3,000 ^{PH26} 200/5,500 ^{PH25} 1,000,000 ^C 450 ^D	86.8
Zirconium	mg/kg	n/v	< 1.0

See notes last page

Table 6
Summary of Phytoremediation Orchard Analytical Results Summary
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine

Notes:

Schedule : CSR Schedule 3.1 - Part 1.2 & 3 (Contaminated Sites Regulation [B.C. Reg. 375/96, April 1, 1997; includes amendments up to July 7, 2021 by B.C. Reg. 179/2021])

- A Part 1 Matrix Standard - Industrial Land Use (IL) - Groundwater flow to surface water used by aquatic life (freshwater)
- B Part 1 Matrix Standard - Industrial Land Use (IL) - Groundwater used for drinking water
- C Part 1 Matrix Standard - Industrial Land Use (IL) - Intake of contaminated soil (applicable to all sites)
- D Part 1 Matrix Standard - Industrial Land Use (IL) - Toxicity to soil invertebrates and plants (applicable to all sites)
- E Part 2 Generic Human Health Standard - Industrial Land Use (IL)
- F Part 3 Generic Ecological Standard - Industrial Land Use (IL)

6.5^A Concentration exceeds the indicated standard.

15.2 Measured concentration did not exceed the indicated standard.

<0.50 Laboratory reporting limit was greater than the applicable standard.

<0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.

n/v No standard/guideline value.

- Parameter not analyzed / not available.

CR QUALIFIER DESCRIPTION MISSING

>_N3 QUALIFIER DESCRIPTION MISSING

>_N0 QUALIFIER DESCRIPTION MISSING

N0 Soil standards protective of groundwater used for drinking water are the same regardless of land use.

N0D Chloride ion standards apply to soluble chloride.

CD Standard applies to total chromium (all species).

N6,>_N6 N5 - Standard applies to hexavalent chromium (Cr6+) / N6 - Standard applies to trivalent chromium (Cr3+)

N6,N6 N5 - Standard applies to hexavalent chromium (Cr6+) / N6 - Standard applies to trivalent chromium (Cr3+)

N6D Sodium ion standards apply to soluble sodium.

PH0 Beryllium standards vary with soil pH from 1-2,500 ug/g for groundwater used for drinking water for all land use types. For pH < 5.5 standard = 1 ug/g; For pH 5.5-< 6.0 standard = 1.5; For pH 6.0-< 6.5 standard = 4 ug/g; For pH 6.5->7.0 standard = 20 ug/g; For pH 7.0->7.5 standard = 150 ug/g; For pH 7.5->8.0 standard = 1,000 ug/g; For pH ≥ 8.0 standard = 2,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 6.

PH2 Beryllium standards vary with soil pH from 1-500 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 6.5 standard = 1 ug/g; For pH 6.5-<7.0 standard = 4 ug/g; For pH 7.0-<7.5 standard = 30 ug/g; For pH 7.5-<8.0 standard = 250 ug/g; For pH ≥ 8.0 standard = 500 ug/g. Consult CSR Schedule 3.1.1, Matrix 6.

PH6 Cadmium standards vary with soil pH from 1-70 ug/g for groundwater used for drinking water for all land use types. For pH < 7.0 standard = 1 ug/g; For pH 7.0->7.5 standard = 4.5 ug/g; For pH 7.5->8.0 standard = 30 ug/g; For pH ≥ 8.0 standard = 70 ug/g. Consult CSR Schedule 3.1.1, Matrix 7.

PH2 Cadmium standards vary with soil pH from 1-50 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 7.0 standard = 1 ug/g; For pH 7.0->7.5 standard = 3 ug/g; For pH 7.5->8.0 standard = 20 ug/g; For pH ≥ 8.0 standard = 50 ug/g. Consult CSR Schedule 3.1.1, Matrix 7.

PH11 Lead standards vary with soil pH from 120-8,500 ug/g for groundwater used for drinking water for all land use types. For pH < 5.5 standard = 120 ug/g; For pH 5.5-<6.0 standard = 150 ug/g; For pH 6.0 -<6.5 standard = 800 ug/g; For pH 6.5-<7.0 standard = 3,500 ug/g; For pH 7.0-<7.5 standard = 7,500 ug/g; For pH ≥ 7.5 standard = 8,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 18.

PH12 Lead standards vary with soil pH from 200-90,000 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 5.0 standard = 200 ug/g; For pH 5.0 -<5.5 standard = 350 ug/g; For pH 5.5-<6.0 standard = 1,500 ug/g; For pH 6.0 -<6.5 standard = 8,500 ug/g; For pH 6.5-<7.0 standard = 35,000 ug/g; For pH 7.0->7.5 standard = 80,000 ug/g; For pH ≥ 7.5 standard = 90,000 ug/g. Consult CSR Schedule 3.1.1, Matrix 18.

PH16 Nickel standards vary with soil pH from 70-500 ug/g for groundwater used for drinking water for all land use types. For pH < 7.5 standard = 70 ug/g; For pH 7.5-<8.0 standard = 250 ug/g; For pH ≥ 8.0 standard = 500 ug/g. Consult CSR Schedule 3.1.1, Matrix 24.

PH17 Nickel standards vary with soil pH from 90-9,500 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 5.0 standard = 90 ug/g; For pH 5.0 -<5.5 standard = 100 ug/g; For pH 5.5-<6.0 standard = 150 ug/g; For pH 6.0 -<6.5 standard = 200 ug/g; For pH 6.5-<7.0 standard = 300 ug/g; For pH 7.0->7.5 standard = 900 ug/g; For pH 7.5-<8.0 standard = 5,000 ug/g; For pH ≥ 8.0 standard = 9,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 24.

PH19 Zinc standards vary with soil pH from 200-5,500 ug/g for groundwater used for drinking water for all land use types. For pH < 5.0 standard = 200 ug/g; For pH 5.0 -<5.5 standard = 250 ug/g; For pH 5.5-<6.0 standard = 300 ug/g; For pH 6.0 -<6.5 standard = 450 ug/g; For pH 6.5-<7.0 standard = 600 ug/g; For pH 7.0->7.5 standard = 1,000 ug/g; For pH 7.5-<8.0 standard = 3,000 ug/g; For pH ≥ 8.0 standard = 5,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 40.

PH19 Zinc standards vary with soil pH from 150-3,000 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 6.0 standard = 150 ug/g; For pH 6.0 -<6.5 standard = 250 ug/g; For pH 6.5-<7.0 standard = 350 ug/g; For pH 7.0->7.5 standard = 600 ug/g; For pH 7.5-<8.0 standard = 1,500 ug/g; For pH ≥ 8.0 standard = 3,000 ug/g. Consult CSR Schedule 3.1.1, Matrix 40.

PH10 Copper standards vary with soil pH from 250-100,000 ug/g for groundwater used for drinking water for all land use types. For pH < 5.0 standard = 250 ug/g; For pH 5.0 -<5.5 standard = 500 ug/g; For pH 5.5-<6.0 standard = 2,000 ug/g; For pH 6.0 -<6.5 standard = 10,000 ug/g; For pH 6.5-<7.0 standard = 50,000 ug/g; For pH ≥ 7.0 standard = 100,000 ug/g. Consult CSR Schedule 3.1.1, Matrix 11.

PH10 Copper standards vary with soil pH from 75-7,500 ug/g for groundwater flow to surface water used by aquatic life (freshwater) for all land use types. For pH < 5.5 standard = 75 ug/g; For pH 5.5-<6.0 standard = 100 ug/g; For pH 6.0 -<6.5 standard = 700 ug/g; For pH 6.5-<7.0 standard = 3,000 ug/g; For pH 7.0-<7.5 standard = 6,500 ug/g; For pH ≥ 7.5 standard = 7,500 ug/g. Consult CSR Schedule 3.1.1, Matrix 11.

Table 9
Summary of LC50 Daphnia Magna Results
2022 Annual Environmental Effects Monitoring Report
Regional District of Kitimat-Stikine
2022

19-Jan-22

Concentration	Unit	# of Living Organisms		Number Immobilized	Temperature (°C)			Dissolved Oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24 hours	48 hours		0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	48 hrs
Control	%	10	10	0	19.5	19.5	19.5	8.4	8.8	8.4	8	8	7.7	334	339
6.25	%	10	10	0	19.5	19.5	19.5	8.4	9.1	8.4	8	8	7.8	394	394
12.5	%	10	10	0	20	19.5	19.5	8.4	8	7.9	7.9	8.1	7.9	448	448
25	%	10	10	0	20	19.5	19.5	8.2	7.4	7.4	7.9	8.1	8	562	556
50	%	10	10	0	20	19.5	19.5	8	7.4	6.7	7.8	8.1	8.2	791	776
100	%	10	10	0	19.5	19.5	19.5	7.4	2.8	2.2	7.6	7.8	7.8	1239	1189

Test Results: The 48 hour LC50 is estimated to be > 100% (v/v).

30-Mar-22

Concentration	Unit	# of Living Organisms		Number Immobilized	Temperature (°C)			Dissolved Oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24 hours	48 hours		0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	48 hrs
Control	%	10	10	0	18.5	19.5	19	9	8.4	8.5	8	8	7.9	371	373
6.25	%	10	10	0	19	19.5	18.5	8.9	8.5	8.5	8	8	8	387	390
12.5	%	10	10	0	19	19.5	18.5	8.9	8.4	8.5	7.9	8	8	402	405
25	%	10	10	0	19.5	19.5	18.5	8.8	8.4	8.4	7.7	7.9	8.1	433	436
50	%	10	10	0	19.5	19.5	18.5	8.2	8.3	8.4	7.4	7.7	8	496	492
100	%	10	10	0	19	19.5	18.5	6.7	7.5	8	7	7.5	8.1	633	614

Test Results: The 48 hour LC50 is estimated to be > 100% (v/v).

14-Jul-22

Concentration	Unit	# of Living Organisms		Number Immobilized	Temperature (°C)			Dissolved Oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24 hours	48 hours		0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	48 hrs
Control	%	10	10	0	19.5	20	19.5	8.9	8.4	8.5	7.8	7.5	7.7	358	359
6.25	%	10	10	0	20	20	19.5	8.8	8.4	8.5	7.8	7.6	7.8	386	387
12.5	%	10	10	0	20	19.5	19.5	8.7	8.5	8.5	7.8	7.6	7.9	416	415
25	%	10	10	0	20	19.5	19.5	8.5	8.5	8.6	7.7	7.7	8	472	469
50	%	10	10	0	20	19.5	19.5	8.0	8.4	8.6	7.5	7.7	8.1	586	576
100	%	10	10	0	20	19.5	19.5	6.8	8.1	8.6	7.3	7.7	8.1	826	790

Test Results: The 48 hour LC50 is estimated to be > 100% (v/v).

14-Oct-22

Concentration	Unit	# of Living Organisms		Number Immobilized	Temperature (°C)			Dissolved Oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24 hours	48 hours		0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	24 hrs	48 hrs	0 hrs	48 hrs
Control	%	10	10	0	19.5	19.5	20	8.4	8.4	8.5	7.6	7.7	7.7	358	360
6.25	%	10	10	0	19	19.5	20	8.3	8.3	8.4	7.7	7.7	7.7	383	365
12.5	%	10	10	0	19	19.5	20	8.4	8.3	8.5	7.7	7.7	7.8	410	413
25	%	10	10	0	19	19.5	19.5	8.4	8.3	8.5	7.7	7.7	7.8	461	462
50	%	10	10	0	19	19.5	19.5	8.3	8.3	8.4	7.6	7.7	7.9	567	566
100	%	10	10	0	19.5	19.5	19.5	7.6	8.1	8.3	7.5	7.8	8	794	778

Test Results: The 48 hour LC50 is estimated to be > 100% (v/v).

Appendix G Laboratory Analytical Certificates





CERTIFICATE OF ANALYSIS

Work Order : **VA22A1137**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton EQ LC50
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Q62338
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 2
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-Jan-2022 21:10
Date Analysis Commenced : 21-Jan-2022
Issue Date : 11-Feb-2022 11:01

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Trace Chometsky	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 Outlet	----	----	----	----
					Client sampling date / time	19-Jan-2022 13:05	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A1137-001	Result	----	----	----	----
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached		----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A1137	Page	: 1 of 4
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 20-Jan-2022 21:10
PO	: ----	Issue Date	: 11-Feb-2022 11:01
C-O-C number	: ----		
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Bioassays : Survival/LC50 Daphnia Magna 48 hours										
LDPE carboy Wetland 4 Outlet	DAP-LC50-48	19-Jan-2022	----	----	----		21-Jan-2022	5 days	2 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

- No Quality Control data available for this section.



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Burnaby) - 8664 Commerce Court Burnaby British Columbia Canada V5A 4N7	Water	EPS1/RM/14	See attached report.

QUALITY CONTROL REPORT

Work Order	: VA22A1137	Page	: 1 of 2
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 20-Jan-2022 21:10
PO	: ----	Date Analysis Commenced	: 21-Jan-2022
C-O-C number	: ----	Issue Date	: 11-Feb-2022 11:01
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Trace Chometsky	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia

Page : 2 of 2
Work Order : VA22A1137
Client : Regional District of Kitimat-Stikine
Project : Hazelton EQ LC50



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



Acute Toxicity Test Results

Sample VA22A1137-001 Wetland 4 Outlet,
collected January 19, 2022

Final Report

January 28, 2022

Submitted to: **ALS Environmental**
Burnaby, BC

SAMPLE INFORMATION

Sample ID	Dates		<i>Daphnia magna</i> test initiation	Receipt temp.
	Collected	Received		
VA22A1137-001 Wetland 4 Outlet	19-Jan-21 at 1305h	21-Jan-21 at 0838h	21-Jan-21 at 1130h	7.5°C

TESTS

- *Daphnia magna* 48-h LC50 test

RESULTS

Toxicity test results

Sample ID	LC50 (% v/v)
VA22A1137-001 Wetland 4 Outlet	>100

LC = Lethal Concentration

QA/QC

QA/QC summary	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	5.2 (4.2 – 6.4) g/L NaCl ¹
Reference toxicant historical mean (2 SD range)	5.1 (3.6 – 7.2) g/L NaCl
Reference toxicant CV	17%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date: January 18, 2022, LC = Lethal Concentration, SD = Standard Deviation, CL = Confidence Limits, CV = Coefficient of Variation



Report By:
Gabriella Utomo, B.Sc.
Laboratory Biologist



Reviewed By:
Edmund Canaria, R.P. Bio.
Senior Analyst

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

APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 48-h *Daphnia magna* LC50 test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24-hour old neonates
Test type	Static
Test duration	48 hours
Test vessel	250-mL glass beaker
Test volume	200 mL
Test solution depth	6 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Moderately-hard reconstituted water + 2.5 µg/L Se
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen and pH measured daily; salinity, hardness and alkalinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/14, with 2016 amendments
Statistical software	CETIS Version 1.9.4
Test endpoint	Survival (48-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Sodium chloride (NaCl)

APPENDIX B – Toxicity test data

Daphnia magna Summary Sheet

Client: ALS
Work Order No.: ✓ 220115
SKH

Start Date/Time: Jan 21/22 @ 1130h
Test Species: Daphnia magna
Set up by: KYL

Sample Information:

Sample ID: VAA^{22A}1137-001-AA Wetland 4
Sample Date: Jan 19/22 Outlet
Date Received: Jan 21/22
Sample Volume: 2 x 1 L

Test Validity Criteria:
≥ 90% mean control survival and/or mobility and ≤ 2 daphnids exhibit immobility and/or mortality in any single control replicate.
WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 122921C
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 38
Mortality (%) in previous 7 d: 0
Days to first brood: 7

NaCl Reference Toxicant Results:

Reference Toxicant ID: DmDC88
Stock Solution ID: 21Na03
Date Initiated: January 18, 2022
48-h LC50 (95% CL): 5.2 (4.2 - 6.4) g/LNaCL

Reference Toxicant Mean and Historical Range: 5.1 (3.6 - 7.2) g/L NaCL
Reference Toxicant CV (%): 17

Test Results: The 48 h LC50 is estimated to be > 100% (v/v).

Reviewed by: [Signature]

Date reviewed: Jan 28, 2022

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: ALS
 Sample ID: VAA 1137-001 AA (wetlands & outlet)
 Work Order No.: 220115
 CER #: 5

Start Date/Time: Jan. 21 2022 @ 1130h
 Test Organism: D. magna
 # Organisms/volume: 10/200mL
 Set up by: KUL

Thermometer: CER#5 pH meter/probe: 6 / 6 DO meter/probe: 6 / 6 Cond./Salinity meter/probe: 6 / 6

Concentration (L/Vol)	Number of Live Organisms Rep	24		No. Immobilized 48	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		0	24	48	0	24	48	0	24	48	0	48
Control	A	10	10	0	19.5	19.5	19.5	8.4	8.8	8.4	8.0	8.0	8.1	334	339
	B												7.7		
	C														
	D														
6.25	A	10	10	0	19.5	19.5	19.5	8.4	9.1	8.4	8.0	8.0	8.0	394	394
	B												7.8		
	C														
	D														
12.5	A	10	10	0	20.0	19.5	19.5	8.4	8.0	7.9	7.9	8.1	8.0	448	448
	B												7.9		
	C														
	D														
25	A	10	10	0	20.0	19.5	19.5	8.2	7.4	7.4	7.9	8.1	8.0	562	556
	B														
	C														
	D														
50	A	10	10	0	20.0	19.5	19.5	8.0	7.4	6.7	7.8	8.1	8.2	791	776
	B														
	C														
	D														
100	A	10	10	0	19.5	19.5	19.5	7.4	2.8	2.2	7.6	7.8	7.8	1239	1189
	B														
	C														
	D														
Technician Initials		Jm	PM	PM	KUL	Jm	PM	KUL	Jm	PM	KUL	Jm	PM	KUL	PM

Concentration	Hardness* (mg/L as CaCO3)	Alkalinity*
Control (MHW)	100	84
Highest conc.	450	530
Hardness adjusted	-	-

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.0		19.5
DO (mg/L)	2.8	acerate for 10 min	7.4
pH	7.1		7.6
Cond (µS/cm)	1264		1239
Salinity (ppt)	0.6		0.6

Sample Description: Pale yellow, slightly turbid, odourless, black ^{SKH} pre particulates.
 Comments: Mortality: Heartbeat checked under microscope not record

Batch#: 122921C 7-d previous # young/brood: 38 Previous 7-d Mortality (%): 0 Day of 1st Brood: 7

Reviewed by: [Signature] Date reviewed: Jan. 28, 2022

APPENDIX C – Chain-of-custody form



Chain of Custody
 Vancouver - Environmental
 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9

39283



Destination Lab: **Nautilus Environmental (Burnaby)**

Address: 8664 Commerce Court Burnaby BC
 Canada V5A 4N7

Work Order Number: **VA22A1137**

Original Receipt Date/Time: 20/01/2022 21:10
 Instructions Received

Relinquished By

Date/Time

Received By

Date/Time

Receipt Temp

Return as Indicated: Results: alsev.datasublet@alsglobal.com Invoice: alsev.datasublet@alsglobal.com Electronic Data: alsev.datasublet@alsglobal.com
 Attention: Amber Springer

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA22A1137-001	Wetland 4 Outlet	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	11-02-2022	19/01/2022 13:05	
VA22A1137-001	Wetland 4 Outlet	Water	LDPE carboy			11-02-2022	19/01/2022 13:05	

2x1L

TM

Jan 21/22 @ 8:38

220115

7.50L

END OF REPORT



Chain of Custody (COC) / Analytical Request Form

COC Number: 17 -

Affix ALS barcode label here
(lab use only)

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To Contact and company name below will appear on the final report: Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report: Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: eblaney@rdks.bc.ca Email 2: hshinton@rdks.bc.ca Email 3: nveikle@rdks.bc.ca			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply EMERGENCY 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] <input type="checkbox"/>						
Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Nicki Veikle		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca Email 2: nveikle@rdks.bc.ca			Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below For tests that can not be performed according to the service level selected, you will be contacted.						
Project Information ALS Account # / Quote #: Job #: Hazelton EQ LC50 PO / AFE: LSD: ALS Lab Work Order # (lab use only):		Oil and Gas Required Fields (client use) AFE/Cost Center: Major/Minor Code: Requisitioner: Location: ALS Contact: Amber Springer Sampler: H.Shinton			Acute toxicity LC50 Daphnia magna						
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	SAMPLES ON HOLD Sample is hazardous (please provide further detail)				
	Wetland 4 Outlet			19-Jan-22	1:05	Effluent	NUMBER OF CONTAINERS				
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)			SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 8.6 FINAL COOLER TEMPERATURES °C: 4.5						
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: January 20 th , 2022 Time:				INITIAL SHIPMENT RECEPTION (lab use only) Received by: Chris Date: 20 Jan 22 Time: 11:05			FINAL SHIPMENT RECEPTION (lab use only) Received by: PD Date: JAN 20 2022 Time: 21:10				

Environmental Division
Vancouver
Work Order Reference
VA22A1137

Telephone: +1 804 253 4188

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



CERTIFICATE OF ANALYSIS

Work Order : **VA22A1147**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : H. Shinton
Site :
Quote number : Q62338
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 8
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-Jan-2022 21:10
Date Analysis Commenced : 21-Jan-2022
Issue Date : 04-Feb-2022 14:44

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	<i>Detection Limit adjusted for required dilution.</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>



Analytical Results

Sub-Matrix: Effluent

Client sample ID

(Matrix: Water)

					Wetland 4 @ Outlet	Facility 1	----	----	----
Client sampling date / time					19-Jan-2022 13:06	19-Jan-2022 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-001 Result	VA22A1147-002 Result	-----	-----	-----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	568	558	----	----	----
conductivity	----	E100	2.0	µS/cm	1290	1290	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	491	497	----	----	----
pH	----	E108	0.10	pH units	7.80	7.84	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	12.2	12.2	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	91.0	90.2	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.100 ^{DLDS}	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	14.8	15.2	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0250 ^{DLDS}	<0.0250 ^{DLDS}	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 ^{DLDS}	<0.0050 ^{DLDS}	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	13.6	13.7	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0019	0.0011	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2.72	2.66	----	----	----
Organic / Inorganic Carbon									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	55.1	58.3	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0682	0.0653	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00060	0.00061	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0128	0.0139	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.308	0.318	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000250 ^{DLA}	<0.000250 ^{DLA}	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.664	0.670	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000398	0.0000497	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	144	145	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000050 ^{DLA}	<0.000050 ^{DLA}	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00189	0.00196	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00527	0.00547	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00250 ^{DLA}	<0.00250 ^{DLA}	----	----	----



Analytical Results

Sub-Matrix: Effluent

(Matrix: Water)

					Client sample ID	Wetland 4 @ Outlet	Facility 1	----	----	----
					Client sampling date / time	19-Jan-2022 13:06	19-Jan-2022 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-001	VA22A1147-002	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
iron, total	7439-89-6	E420	0.010	mg/L	4.42	4.77	---	---	---	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000250 ^{DLA}	<0.000250 ^{DLA}	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0050 ^{DLA}	<0.0050 ^{DLA}	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	31.9	32.7	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	12.1	12.4	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000097	0.0000058	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00112	0.00106	---	---	---	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00847	0.00885	---	---	---	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.250 ^{DLA}	<0.250 ^{DLA}	---	---	---	
potassium, total	7440-09-7	E420	0.050	mg/L	17.1	17.8	---	---	---	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00374	0.00401	---	---	---	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000250 ^{DLA}	<0.000250 ^{DLA}	---	---	---	
silicon, total	7440-21-3	E420	0.10	mg/L	6.78	7.10	---	---	---	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000050 ^{DLA}	<0.000050 ^{DLA}	---	---	---	
sodium, total	7440-23-5	E420	0.050	mg/L	82.2	84.9	---	---	---	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.942	0.953	---	---	---	
sulfur, total	7704-34-9	E420	0.50	mg/L	<2.50 ^{DLA}	<2.50 ^{DLA}	---	---	---	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00100 ^{DLA}	<0.00100 ^{DLA}	---	---	---	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000050 ^{DLA}	<0.000050 ^{DLA}	---	---	---	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00050 ^{DLA}	<0.00050 ^{DLA}	---	---	---	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00050 ^{DLA}	<0.00050 ^{DLA}	---	---	---	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00199	0.00183	---	---	---	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00050 ^{DLA}	<0.00050 ^{DLA}	---	---	---	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000340	0.000345	---	---	---	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00250 ^{DLA}	<0.00250 ^{DLA}	---	---	---	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0150 ^{DLA}	<0.0150 ^{DLA}	---	---	---	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00100 ^{DLA}	<0.00100 ^{DLA}	---	---	---	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	44.0	50.8	---	---	---	
chemical oxygen demand [COD]	----	E559	20	mg/L	175	181	---	---	---	
Volatile Organic Compounds [Fuels]										



Analytical Results

Sub-Matrix: Effluent

(Matrix: Water)

					Client sample ID	Wetland 4 @ Outlet	Facility 1	----	----	----
					Client sampling date / time	19-Jan-2022 13:06	19-Jan-2022 12:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-001	VA22A1147-002	-----	-----	-----	
					Result	Result	---	---	---	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
toluene	108-88-3	E611A	0.50	µg/L	10.5	10.4	----	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	84.9	83.9	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	103	103	----	----	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	----	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----	
VPHw	----	EC580A	100	µg/L	<100	<100	----	----	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	77.4	86.1	----	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	80.5	92.1	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					[19-Jan-2022]	19-Jan-2022 12:56	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-003	VA22A1147-004	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
alkalinity, total (as CaCO3)	---	E290	1.0	mg/L	<1.0	<1.0	---	---	---	
conductivity	---	E100	2.0	µS/cm	---	<2.0	---	---	---	
hardness (as CaCO3), from total Ca/Mg	---	EC100A	0.60	mg/L	<0.60	<0.60	---	---	---	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	---	---	---	
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	---	---	---	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<0.020	---	---	---	
nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	---	---	---	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	---	---	---	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	---	---	---	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	---	---	---	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	---	---	---	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	---	---	---	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	----	----	----
Client sampling date / time					[19-Jan-2022]	19-Jan-2022 12:56	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-003	VA22A1147-004	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<0.10	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	----	<2.0	----	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	----	<0.50	----	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	----	<0.50	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	----	<0.50	----	----	----	
styrene	100-42-5	E611A	0.50	µg/L	----	<0.50	----	----	----	
toluene	108-88-3	E611A	0.50	µg/L	----	<0.50	----	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	----	<0.40	----	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	----	<0.30	----	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	----	<0.50	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					[19-Jan-2022]	19-Jan-2022 12:56	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22A1147-003	VA22A1147-004	-----	-----	-----	
					Result	Result	---	---	---	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	---	85.7	---	---	---	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	---	102	---	---	---	
Hydrocarbons										
EPH (C10-C19)	---	E601A	250	µg/L	---	<250	---	---	---	
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	---	<100	---	---	---	
EPH (C10-C32)	---	E601A	400	µg/L	---	<400	---	---	---	
EPH (C19-C32)	---	E601A	250	µg/L	---	<250	---	---	---	
VPHw	---	EC580A	100	µg/L	---	<100	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	---	77.4	---	---	---	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	---	92.8	---	---	---	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A1147	Page	: 1 of 14
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 20-Jan-2022 21:10
PO	: ----	Issue Date	: 04-Feb-2022 14:44
C-O-C number	: ----		
Sampler	: H. Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Facility 1	E550	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Field Blank	E550	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Wetland 4 @ Outlet	E550	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry											
Amber glass total (sulfuric acid) Facility 1	E559	19-Jan-2022	----	----	----		01-Feb-2022	28 days	13 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E559	19-Jan-2022	----	----	----		01-Feb-2022	28 days	13 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Facility 1	E298	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Field Blank	E298	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E298	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	19-Jan-2022	02-Feb-2022	----	----		03-Feb-2022	28 days	16 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Facility 1	E235.CI	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Field Blank	E235.CI	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Travel Blank	E235.CI	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Wetland 4 @ Outlet	E235.CI	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE Field Blank	E378-U	19-Jan-2022	----	----	----		22-Jan-2022	3 days	2 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE Wetland 4 @ Outlet	E378-U	19-Jan-2022	----	----	----		22-Jan-2022	3 days	2 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE Facility 1	E378-U	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)											
HDPE Travel Blank	E378-U	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Facility 1	E235.F	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Field Blank	E235.F	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Travel Blank	E235.F	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Wetland 4 @ Outlet	E235.F	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Facility 1	E235.NO3-L	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO3-L	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Facility 1	E235.NO2-L	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO2-L	19-Jan-2022	----	----	----		22-Jan-2022	3 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE Facility 1	E235.SO4	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Field Blank	E235.SO4	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Travel Blank	E235.SO4	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Wetland 4 @ Outlet	E235.SO4	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Facility 1	E318	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E318	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Facility 1	E366	19-Jan-2022	31-Jan-2022	----	----		01-Feb-2022	28 days	13 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Field Blank	E366	19-Jan-2022	31-Jan-2022	----	----		01-Feb-2022	28 days	13 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E366	19-Jan-2022	31-Jan-2022	----	----		01-Feb-2022	28 days	13 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Travel Blank	E366	19-Jan-2022	02-Feb-2022	----	----		03-Feb-2022	28 days	16 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Facility 1	E601A	19-Jan-2022	30-Jan-2022	14 days	11 days	✓	31-Jan-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	19-Jan-2022	30-Jan-2022	14 days	11 days	✓	31-Jan-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 4 @ Outlet	E601A	19-Jan-2022	30-Jan-2022	14 days	11 days	✓	31-Jan-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Facility 1	E581.VH+F1	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E581.VH+F1	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Facility 1	E355-L	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E355-L	19-Jan-2022	31-Jan-2022	----	----		31-Jan-2022	28 days	12 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE Facility 1	E290	19-Jan-2022	----	----	----		22-Jan-2022	14 days	3 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Field Blank	E290	19-Jan-2022	----	----	----		22-Jan-2022	14 days	3 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Travel Blank	E290	19-Jan-2022	----	----	----		22-Jan-2022	14 days	3 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Wetland 4 @ Outlet	E290	19-Jan-2022	----	----	----		22-Jan-2022	14 days	3 days	✓	
Physical Tests : Conductivity in Water											
HDPE Facility 1	E100	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Physical Tests : Conductivity in Water											
HDPE Field Blank	E100	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Physical Tests : Conductivity in Water											
HDPE Wetland 4 @ Outlet	E100	19-Jan-2022	----	----	----		22-Jan-2022	28 days	3 days	✓	
Physical Tests : pH by Meter											
HDPE Wetland 4 @ Outlet	E108	19-Jan-2022	----	----	----		22-Jan-2022	0.25 hrs	68 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Facility 1	E108	19-Jan-2022	----	----	----		22-Jan-2022	0.25 hrs	69 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Facility 1	E508	19-Jan-2022	----	----	----		23-Jan-2022	28 days	4 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	19-Jan-2022	----	----	----		23-Jan-2022	28 days	4 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 4 @ Outlet	E508	19-Jan-2022	----	----	----		23-Jan-2022	28 days	4 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) Travel Blank	E508	19-Jan-2022	----	----	----		23-Jan-2022	28 days	5 days	✓	
Total Metals : Total Metals in Water by CRC ICMS											
HDPE total (nitric acid) Field Blank	E420	19-Jan-2022	----	----	----		29-Jan-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICMS											
HDPE total (nitric acid) Facility 1	E420	19-Jan-2022	----	----	----		31-Jan-2022	180 days	12 days	✓	
Total Metals : Total Metals in Water by CRC ICMS											
HDPE total (nitric acid) Wetland 4 @ Outlet	E420	19-Jan-2022	----	----	----		31-Jan-2022	180 days	12 days	✓	
Total Metals : Total Metals in Water by CRC ICMS											
HDPE - total (lab preserved) Travel Blank	E420	19-Jan-2022	----	----	----		31-Jan-2022	180 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Facility 1	E611A	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Field Blank	E611A	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E611A	19-Jan-2022	30-Jan-2022	----	----		31-Jan-2022	14 days	12 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	392510	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	398509	2	38	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	392660	2	22	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	398075	1	14	7.1	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	399563	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	392502	1	19	5.2	5.0	✓
Conductivity in Water	E100	392508	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	392512	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	392501	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	392504	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	392505	1	17	5.8	5.0	✓
pH by Meter	E108	392509	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	392506	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	398510	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	393258	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396532	2	37	5.4	5.0	✓
Total Nitrogen by Colourimetry	E366	398506	2	23	8.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	398505	1	9	11.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	398076	1	8	12.5	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	392510	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	398509	2	38	5.2	5.0	✓
BC PHCs - EPH by GC-FID	E601A	398103	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	392660	2	22	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	398075	1	14	7.1	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	399563	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	392502	1	19	5.2	5.0	✓
Conductivity in Water	E100	392508	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	392512	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	392501	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	392504	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	392505	1	17	5.8	5.0	✓
pH by Meter	E108	392509	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	392506	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	398510	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	393258	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396532	2	37	5.4	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Nitrogen by Colourimetry	E366	398506	2	23	8.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	398505	1	9	11.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	398076	1	8	12.5	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	392510	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	398509	2	38	5.2	5.0	✓
BC PHCs - EPH by GC-FID	E601A	398103	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	392660	2	22	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	398075	1	14	7.1	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	399563	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	392502	1	19	5.2	5.0	✓
Conductivity in Water	E100	392508	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	392512	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	392501	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	392504	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	392505	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	392506	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	398510	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	393258	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396532	2	37	5.4	5.0	✓
Total Nitrogen by Colourimetry	E366	398506	2	23	8.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	398505	1	9	11.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	398076	1	8	12.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	398509	2	38	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	398075	1	14	7.1	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	399563	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	392502	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	392512	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	392501	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	392504	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	392505	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	392506	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	398510	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	393258	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	396532	2	37	5.4	5.0	✓
Total Nitrogen by Colourimetry	E366	398506	2	23	8.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	398505	1	9	11.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	398076	1	8	12.5	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a flow analyzer on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559 Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order : **VA22A1147**

Page : 1 of 18

Client : Regional District of Kitimat-Stikine
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : H. Shinton
Site :
Quote number : Q62338
No. of samples received : 4
No. of samples analysed : 4

Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-Jan-2022 21:10
Date Analysis Commenced : 21-Jan-2022
Issue Date : 04-Feb-2022 14:44

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia

Page : 2 of 18
Work Order : VA22A1147
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 392508)											
YL2200039-001	Anonymous	conductivity	----	E100	2.0	µS/cm	8840	8850	0.113%	10%	----
Physical Tests (QC Lot: 392509)											
YL2200039-001	Anonymous	pH	----	E108	0.10	pH units	7.86	7.88	0.254%	4%	----
Physical Tests (QC Lot: 392510)											
YL2200039-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	145	148	1.78%	20%	----
Anions and Nutrients (QC Lot: 392501)											
VA22A1125-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 392502)											
VA22A1125-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	34.6	34.8	0.431%	20%	----
Anions and Nutrients (QC Lot: 392504)											
VA22A1125-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 392505)											
VA22A1125-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 392506)											
VA22A1125-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	280	282	0.577%	20%	----
Anions and Nutrients (QC Lot: 392512)											
VA22A1147-001	Wetland 4 @ Outlet	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0019	0.0015	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 398506)											
FJ2200222-001	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.285	0.284	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 398509)											
FJ2200222-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.261	0.259	0.598%	20%	----
Anions and Nutrients (QC Lot: 398510)											
VA22A1147-001	Wetland 4 @ Outlet	Kjeldahl nitrogen, total [TKN]	----	E318	0.500	mg/L	14.8	14.6	1.76%	20%	----
Anions and Nutrients (QC Lot: 400589)											
VA22A1147-003	Travel Blank	nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 400590)											
VA22A1147-003	Travel Blank	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 398505)											
FJ2200222-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.05	1.16	0.10	Diff <2x LOR	----
Total Metals (QC Lot: 393258)											
VA22A1078-002	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 396532)											
FJ2200142-001	Anonymous	aluminum, total	7429-90-5	E420	0.0060	mg/L	0.102	0.0911	11.7%	20%	----
		antimony, total	7440-36-0	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00020	mg/L	0.00027	0.00027	0.000005	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00020	mg/L	0.0335	0.0331	1.10%	20%	----
		beryllium, total	7440-41-7	E420	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.020	mg/L	0.052	0.051	0.002	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000100	mg/L	0.0000247	0.0000276	0.0000029	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.100	mg/L	253	250	0.956%	20%	----
		cesium, total	7440-46-2	E420	0.000020	mg/L	0.000055	0.000057	0.000002	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00020	mg/L	0.00022	0.00020	0.00002	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.020	mg/L	0.231	0.228	1.19%	20%	----
		lead, total	7439-92-1	E420	0.000100	mg/L	0.000130	0.000124	0.000006	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0020	mg/L	0.0538	0.0514	4.61%	20%	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	167	167	0.266%	20%	----
		manganese, total	7439-96-5	E420	0.00020	mg/L	0.0256	0.0251	1.95%	20%	----
		molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.000552	0.000547	0.000005	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00100	mg/L	0.00516	0.00515	0.00001	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	3.44	3.42	0.522%	20%	----
		rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00313	0.00301	0.00011	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.100	mg/L	4.66 µg/L	0.00470	0.903%	20%	----
		silicon, total	7440-21-3	E420	0.20	mg/L	3.56	3.61	1.42%	20%	----
		silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.100	mg/L	30.6	30.2	1.31%	20%	----
		strontium, total	7440-24-6	E420	0.00040	mg/L	1.04	1.06	1.39%	20%	----
		sulfur, total	7704-34-9	E420	1.00	mg/L	355	347	2.31%	20%	----
		tellurium, total	13494-80-9	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 396532) - continued											
FJ2200142-001	Anonymous	uranium, total	7440-61-1	E420	0.000020	mg/L	0.00915	0.00897	1.99%	20%	----
		vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Total Metals (QC Lot: 397664)											
KS2200223-001	Anonymous	aluminum, total	7429-90-5	E420	0.0300	mg/L	28.7	27.9	2.78%	20%	----
		antimony, total	7440-36-0	E420	0.00100	mg/L	0.00901	0.00883	0.00018	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00100	mg/L	0.256	0.258	0.466%	20%	----
		barium, total	7440-39-3	E420	0.00100	mg/L	0.390	0.386	1.22%	20%	----
		beryllium, total	7440-41-7	E420	0.000200	mg/L	0.000680	0.000676	0.000004	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.100	mg/L	1.79	1.85	3.06%	20%	----
		cadmium, total	7440-43-9	E420	0.0000500	mg/L	0.000533	0.000436	0.0000962	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.500	mg/L	226	222	1.79%	20%	----
		cesium, total	7440-46-2	E420	0.000100	mg/L	0.00336	0.00323	4.06%	20%	----
		chromium, total	7440-47-3	E420	0.00100	mg/L	0.0622	0.0606	2.65%	20%	----
		cobalt, total	7440-48-4	E420	0.00100	mg/L	0.0280	0.0273	2.28%	20%	----
		copper, total	7440-50-8	E420	0.00500	mg/L	1.97	1.91	3.41%	20%	----
		iron, total	7439-89-6	E420	0.100	mg/L	48.4	47.1	2.64%	20%	----
		lead, total	7439-92-1	E420	0.000500	mg/L	0.0118	0.0118	0.246%	20%	----
		lithium, total	7439-93-2	E420	0.0100	mg/L	0.109	0.106	2.64%	20%	----
		magnesium, total	7439-95-4	E420	0.0500	mg/L	58.2	56.9	2.17%	20%	----
		manganese, total	7439-96-5	E420	0.00100	mg/L	1.99	1.97	1.14%	20%	----
		molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0434	0.0433	0.172%	20%	----
		nickel, total	7440-02-0	E420	0.00500	mg/L	0.0616	0.0597	3.14%	20%	----
		phosphorus, total	7723-14-0	E420	0.500	mg/L	1.54	1.58	0.048	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.500	mg/L	62.9	62.2	1.15%	20%	----
		rubidium, total	7440-17-7	E420	0.00200	mg/L	0.0655	0.0630	3.90%	20%	----
		selenium, total	7782-49-2	E420	0.000500	mg/L	0.00166	0.00104	0.000624	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	1.00	mg/L	56.7	54.8	3.48%	20%	----
		silver, total	7440-22-4	E420	0.000100	mg/L	0.000975	0.00114	15.4%	20%	----
		sodium, total	7440-23-5	E420	0.500	mg/L	2540	2520	1.00%	20%	----
		strontium, total	7440-24-6	E420	0.00200	mg/L	5.40	5.40	0.0683%	20%	----
		sulfur, total	7704-34-9	E420	5.00	mg/L	1290	1290	0.238%	20%	----
		tellurium, total	13494-80-9	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 397664) - continued											
KS2200223-001	Anonymous	thallium, total	7440-28-0	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00100	mg/L	0.00151	0.00162	0.00011	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00300	mg/L	0.753	0.707	6.18%	20%	----
		tungsten, total	7440-33-7	E420	0.00100	mg/L	0.00152	0.00158	0.00006	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000100	mg/L	0.000758	0.000722	0.000036	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00500	mg/L	0.161	0.155	3.30%	20%	----
		zinc, total	7440-66-6	E420	0.0300	mg/L	0.218	0.218	0.0005	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00200	mg/L	0.00258	0.00273	0.00016	Diff <2x LOR	----
Aggregate Organics (QC Lot: 392660)											
KS2200176-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 392661)											
VA22A1147-004	Field Blank	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 399563)											
FJ2200192-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 398075)											
VA22A1147-001	Wetland 4 @ Outlet	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	10.5	10.0	4.73%	30%	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 398076)											
VA22A1147-001	Wetland 4 @ Outlet	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 392508)						
conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 392510)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.2	----
Anions and Nutrients (QCLot: 392501)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 392502)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 392504)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 392505)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 392506)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 392512)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 398506)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 398509)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 398510)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 400589)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 400590)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 398505)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 393258)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 396532)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 396532) - continued						
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 397664)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 397664) - continued						
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
Aggregate Organics (QCLot: 392660)						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---
Aggregate Organics (QCLot: 392661)						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---
Aggregate Organics (QCLot: 399563)						
chemical oxygen demand [COD]	---	E559	20	mg/L	<20	---
Volatile Organic Compounds (QCLot: 398075)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	---
styrene	100-42-5	E611A	0.5	µg/L	<0.50	---
toluene	108-88-3	E611A	0.5	µg/L	<0.50	---
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	---
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	---
Hydrocarbons (QCLot: 398076)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	---
Hydrocarbons (QCLot: 398103)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				Qualifier
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 392508)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 392509)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 392510)									
alkalinity, total (as CaCO ₃)	----	E290	1	mg/L	500 mg/L	99.5	85.0	115	----
Anions and Nutrients (QCLot: 392501)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 392502)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 392504)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100.0	90.0	110	----
Anions and Nutrients (QCLot: 392505)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 392506)									
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 392512)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 398506)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 398509)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.3	85.0	115	----
Anions and Nutrients (QCLot: 398510)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	95.1	75.0	125	----
Anions and Nutrients (QCLot: 400589)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 400590)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.2	85.0	115	----
Organic / Inorganic Carbon (QCLot: 398505)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	106	80.0	120	----
Total Metals (QCLot: 393258)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	94.3	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 396532)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	102	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	112	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	100	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	98.9	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.0	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	99.1	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.6	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	98.6	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	110	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	106	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	94.4	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	108	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	96.0	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.1	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	100	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 396532) - continued									
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.2	80.0	120	----
Total Metals (QCLot: 397664)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	105	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	111	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	107	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	111	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	108	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	96.0	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	106	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	106	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	105	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	92.9	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	91.2	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	99.4	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 397664) - continued									
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	93.3	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	107	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	95.4	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	95.3	80.0	120	----
Aggregate Organics (QCLot: 392660)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	105	85.0	115	----
Aggregate Organics (QCLot: 392661)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	98.9	85.0	115	----
Aggregate Organics (QCLot: 399563)									
chemical oxygen demand [COD]	----	E559	20	mg/L	100 mg/L	106	85.0	115	----
Volatile Organic Compounds (QCLot: 398075)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	105	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	100	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	102	70.0	130	----
Hydrocarbons (QCLot: 398076)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	74.0	70.0	130	----
Hydrocarbons (QCLot: 398103)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	98.5	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	97.8	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 392501)										
VA22A1130-002	Anonymous	fluoride	16984-48-8	E235.F	98.3 mg/L	100 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 392502)										
VA22A1130-002	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	10000 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 392504)										
VA22A1130-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	1280 mg/L	1250 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 392505)										
VA22A1130-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	48.0 mg/L	50 mg/L	96.0	75.0	125	----
Anions and Nutrients (QCLot: 392506)										
VA22A1130-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	10000 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 392512)										
VA22A1147-002	Facility 1	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0357 mg/L	0.03 mg/L	119	70.0	130	----
Anions and Nutrients (QCLot: 398506)										
FJ2200222-002	Anonymous	nitrogen, total	7727-37-9	E366	0.354 mg/L	0.4 mg/L	88.6	70.0	130	----
Anions and Nutrients (QCLot: 398509)										
FJ2200222-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0989 mg/L	0.1 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 398510)										
VA22A1147-002	Facility 1	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 400589)										
VA22A1266-001	Anonymous	nitrogen, total	7727-37-9	E366	8.44 mg/L	8 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 400590)										
VA22A1394-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 398505)										
FJ2200222-002	Anonymous	carbon, total organic [TOC]	----	E355-L	5.34 mg/L	5 mg/L	107	70.0	130	----
Total Metals (QCLot: 393258)										
VA22A1078-003	Anonymous	mercury, total	7439-97-6	E508	0.0000959 mg/L	0.0001 mg/L	95.9	70.0	130	----
Total Metals (QCLot: 396532)										
FJ2200142-002	Anonymous	aluminum, total	7429-90-5	E420	0.191 mg/L	0.2 mg/L	95.6	70.0	130	----
		antimony, total	7440-36-0	E420	0.0211 mg/L	0.02 mg/L	106	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 396532) - continued										
FJ2200142-002	Anonymous	arsenic, total	7440-38-2	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0368 mg/L	0.04 mg/L	91.9	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00942 mg/L	0.01 mg/L	94.2	70.0	130	----
		boron, total	7440-42-8	E420	0.096 mg/L	0.1 mg/L	95.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00996 mg/L	0.01 mg/L	99.6	70.0	130	----
		chromium, total	7440-47-3	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0184 mg/L	0.02 mg/L	92.2	70.0	130	----
		copper, total	7440-50-8	E420	0.0179 mg/L	0.02 mg/L	89.5	70.0	130	----
		iron, total	7439-89-6	E420	1.93 mg/L	2 mg/L	96.7	70.0	130	----
		lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.0894 mg/L	0.1 mg/L	89.4	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0218 mg/L	0.02 mg/L	109	70.0	130	----
		nickel, total	7440-02-0	E420	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.3 mg/L	10 mg/L	103	70.0	130	----
		potassium, total	7440-09-7	E420	3.70 mg/L	4 mg/L	92.6	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		silicon, total	7440-21-3	E420	9.60 mg/L	10 mg/L	96.0	70.0	130	----
		silver, total	7440-22-4	E420	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, total	7440-28-0	E420	0.00372 mg/L	0.004 mg/L	93.0	70.0	130	----
		thorium, total	7440-29-1	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		tin, total	7440-31-5	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, total	7440-32-6	E420	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E420	0.371 mg/L	0.4 mg/L	92.8	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0423 mg/L	0.04 mg/L	106	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 397664)										
KS2200223-002	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		arsenic, total	7440-38-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		barium, total	7440-39-3	E420	0.0906 mg/L	0.1 mg/L	90.6	70.0	130	----
		beryllium, total	7440-41-7	E420	0.199 mg/L	0.2 mg/L	99.5	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0429 mg/L	0.05 mg/L	85.8	70.0	130	----
		boron, total	7440-42-8	E420	0.471 mg/L	0.5 mg/L	94.1	70.0	130	----
		cadmium, total	7440-43-9	E420	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0467 mg/L	0.05 mg/L	93.4	70.0	130	----
		chromium, total	7440-47-3	E420	0.196 mg/L	0.2 mg/L	98.3	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0960 mg/L	0.1 mg/L	96.0	70.0	130	----
		copper, total	7440-50-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		iron, total	7439-89-6	E420	8.90 mg/L	10 mg/L	89.0	70.0	130	----
		lead, total	7439-92-1	E420	0.0888 mg/L	0.1 mg/L	88.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.494 mg/L	0.5 mg/L	98.7	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	5 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.107 mg/L	0.1 mg/L	107	70.0	130	----
		nickel, total	7440-02-0	E420	0.185 mg/L	0.2 mg/L	92.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	50.4 mg/L	50 mg/L	101	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0929 mg/L	0.1 mg/L	92.9	70.0	130	----
		selenium, total	7782-49-2	E420	0.205 mg/L	0.2 mg/L	102	70.0	130	----
		silicon, total	7440-21-3	E420	47.6 mg/L	50 mg/L	95.2	70.0	130	----
		silver, total	7440-22-4	E420	0.0185 mg/L	0.02 mg/L	92.4	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	100 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		thallium, total	7440-28-0	E420	0.0172 mg/L	0.02 mg/L	86.2	70.0	130	----
		thorium, total	7440-29-1	E420	0.111 mg/L	0.1 mg/L	111	70.0	130	----
		tin, total	7440-31-5	E420	0.0995 mg/L	0.1 mg/L	99.5	70.0	130	----
		titanium, total	7440-32-6	E420	0.189 mg/L	0.2 mg/L	94.5	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0954 mg/L	0.1 mg/L	95.4	70.0	130	----
		uranium, total	7440-61-1	E420	0.0180 mg/L	0.02 mg/L	90.0	70.0	130	----
		vanadium, total	7440-62-2	E420	0.504 mg/L	0.5 mg/L	101	70.0	130	----

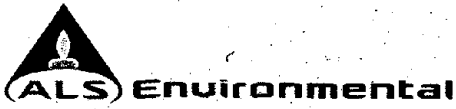


Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 397664) - continued										
KS2200223-002	Anonymous	zinc, total	7440-66-6	E420	1.80 mg/L	2 mg/L	89.8	70.0	130	----
		zirconium, total	7440-67-7	E420	0.209 mg/L	0.2 mg/L	104	70.0	130	----
Aggregate Organics (QCLot: 399563)										
FJ2200244-001	Anonymous	chemical oxygen demand [COD]	----	E559	105 mg/L	100 mg/L	105	75.0	125	----
Volatile Organic Compounds (QCLot: 398075)										
VA22A1147-002	Facility 1	benzene	71-43-2	E611A	96.4 µg/L	100 µg/L	96.4	70.0	130	----
		ethylbenzene	100-41-4	E611A	93.8 µg/L	100 µg/L	93.8	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	101 µg/L	100 µg/L	101	70.0	130	----
		styrene	100-42-5	E611A	99.1 µg/L	100 µg/L	99.1	70.0	130	----
		toluene	108-88-3	E611A	93.4 µg/L	100 µg/L	93.4	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	189 µg/L	200 µg/L	94.4	70.0	130	----
		xylene, o-	95-47-6	E611A	95.6 µg/L	100 µg/L	95.6	70.0	130	----
Hydrocarbons (QCLot: 398076)										
VA22A1147-004	Field Blank	VHw (C6-C10)	----	E581.VH+F1	4220 µg/L	6310 µg/L	66.9	60.0	140	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 17 -

Affix ALS barcode label here (lab use only)

Page of

www.alsglobal.com

Report To, Report Format / Distribution, Select Service Level Below, Invoice To, Invoice Distribution, Project Information, Oil and Gas Required Fields, ALS Lab Work Order # 1147, Sample Identification and/or Coordinates, Drinking Water (DW) Samples, SHIPMENT RELEASE, INITIAL SHIPMENT RECEPTION, FINAL SHIPMENT RECEPTION

Environmental Division Vancouver Work Order Reference VA22A1147



Telephone: +1 804 253 4188

Terrace Shipping #1 Coolers Ground, # Carbouys Air, SFX

CERTIFICATE OF ANALYSIS

Work Order : **VA22A6757**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Soil - Composite Sample
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Q62338
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 4
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 31-Mar-2022 22:00
Date Analysis Commenced : 04-Apr-2022
Issue Date : 21-Apr-2022 15:23

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Xihua Yao	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



Analytical Results

Sub-Matrix: Soil					Client sample ID	Composite soil sample	----	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	30-Mar-2022 14:00	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A6757-001	-----	-----	-----	-----	
Result						----	----	----	----	
Physical Tests										
% saturation	----	E141	1.0	%	41.3	----	----	----	----	
moisture	----	E144	0.25	%	22.3	----	----	----	----	
pH (1:2 soil:water)	----	E108	0.10	pH units	7.23	----	----	----	----	
Particle Size										
sand (2.0mm - 0.05mm)	----	E180	1.0	%	49.9	----	----	----	----	
silt (0.05mm - 0.002mm)	----	E180	1.0	%	26.2	----	----	----	----	
clay (<0.002mm)	----	E180	1.0	%	23.9	----	----	----	----	
texture class	----	E180	-	-	Sandy Clay Loam	----	----	----	----	
Saturated Paste Extractables										
chloride, soluble ion content	16887-00-6	EC239A.Cl	1.0	mg/kg	12.0	----	----	----	----	
chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	29	----	----	----	----	
sodium, soluble ion content	17341-25-2	EC442	1.00	mg/kg	5.37	----	----	----	----	
sodium, soluble ion content	17341-25-2	E442	2.0	mg/L	13.0	----	----	----	----	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	26800	----	----	----	----	
antimony	7440-36-0	E440	0.10	mg/kg	0.65	----	----	----	----	
arsenic	7440-38-2	E440	0.10	mg/kg	13.8	----	----	----	----	
barium	7440-39-3	E440	0.50	mg/kg	196	----	----	----	----	
beryllium	7440-41-7	E440	0.10	mg/kg	0.52	----	----	----	----	
bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	----	----	----	----	
boron	7440-42-8	E440	5.0	mg/kg	<5.0	----	----	----	----	
cadmium	7440-43-9	E440	0.020	mg/kg	0.168	----	----	----	----	
calcium	7440-70-2	E440	50	mg/kg	5800	----	----	----	----	
chromium	7440-47-3	E440	0.50	mg/kg	30.0	----	----	----	----	
cobalt	7440-48-4	E440	0.10	mg/kg	13.5	----	----	----	----	
copper	7440-50-8	E440	0.50	mg/kg	40.5	----	----	----	----	
iron	7439-89-6	E440	50	mg/kg	38500	----	----	----	----	
lead	7439-92-1	E440	0.50	mg/kg	8.68	----	----	----	----	
lithium	7439-93-2	E440	2.0	mg/kg	18.8	----	----	----	----	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	Composite soil sample	----	----	----	----
Client sampling date / time					30-Mar-2022 14:00	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22A6757-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Metals										
magnesium	7439-95-4	E440	20	mg/kg	8010	----	----	----	----	
manganese	7439-96-5	E440	1.0	mg/kg	1000	----	----	----	----	
mercury	7439-97-6	E510	0.0500	mg/kg	0.0503	----	----	----	----	
molybdenum	7439-98-7	E440	0.10	mg/kg	0.80	----	----	----	----	
nickel	7440-02-0	E440	0.50	mg/kg	33.4	----	----	----	----	
phosphorus	7723-14-0	E440	50	mg/kg	837	----	----	----	----	
potassium	7440-09-7	E440	100	mg/kg	1280	----	----	----	----	
selenium	7782-49-2	E440	0.20	mg/kg	0.22	----	----	----	----	
silver	7440-22-4	E440	0.10	mg/kg	0.18	----	----	----	----	
sodium	7440-23-5	E440	50	mg/kg	225	----	----	----	----	
strontium	7440-24-6	E440	0.50	mg/kg	43.5	----	----	----	----	
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----	----	----	----	
thallium	7440-28-0	E440	0.050	mg/kg	0.090	----	----	----	----	
tin	7440-31-5	E440	2.0	mg/kg	<2.0	----	----	----	----	
titanium	7440-32-6	E440	1.0	mg/kg	454	----	----	----	----	
tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	----	----	----	----	
uranium	7440-61-1	E440	0.050	mg/kg	0.456	----	----	----	----	
vanadium	7440-62-2	E440	0.20	mg/kg	63.9	----	----	----	----	
zinc	7440-66-6	E440	2.0	mg/kg	86.8	----	----	----	----	
zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	----	----	----	----	
Leachable Anions & Nutrients										
bromide, leachable	24959-67-9	E235.Br	0.50	mg/kg	<0.50	----	----	----	----	
chloride, leachable	16887-00-6	E235.Cl	20.0	mg/kg	<20.0	----	----	----	----	
nitrate (as N), leachable	14797-55-8	E235.NO3	0.050	mg/kg	0.137	----	----	----	----	
nitrite (as N), leachable	14797-65-0	E235.NO2	0.010	mg/kg	0.026	----	----	----	----	
sulfate, leachable	14808-79-8	E235.SO4	10	mg/kg	<10	----	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A6757	Page	: 1 of 10
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Soil - Composite Sample	Date Samples Received	: 31-Mar-2022 22:00
PO	: ----	Issue Date	: 21-Apr-2022 15:23
C-O-C number	: ----		
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Saturated Paste Extractables	VA22A6757-001	Composite soil sample	% saturation	----	E141	27.4 % DUP-H	20%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Leachable Anions & Nutrients : Leachable Bromide in Soil/Solid by IC											
Amber glass/Teflon lined cap Composite soil sample	E235.Br	30-Mar-2022	13-Apr-2022	28 days	14 days	✓	14-Apr-2022	14 days	1 days	✓	
Leachable Anions & Nutrients : Leachable Chloride in Soil/Solid by IC											
Amber glass/Teflon lined cap Composite soil sample	E235.Cl	30-Mar-2022	13-Apr-2022	30 days	14 days	✓	14-Apr-2022	28 days	1 days	✓	
Leachable Anions & Nutrients : Leachable Nitrate in Soil/Solid by IC											
Amber glass/Teflon lined cap Composite soil sample	E235.NO3	30-Mar-2022	13-Apr-2022	3 days	14 days	* EHT	14-Apr-2022	3 days	1 days	✓	
Leachable Anions & Nutrients : Leachable Nitrite in Soil/Solid by IC											
Amber glass/Teflon lined cap Composite soil sample	E235.NO2	30-Mar-2022	13-Apr-2022	3 days	14 days	* EHT	14-Apr-2022	3 days	1 days	✓	
Leachable Anions & Nutrients : Leachable Sulfate in Soil/Solid by IC											
Amber glass/Teflon lined cap Composite soil sample	E235.SO4	30-Mar-2022	13-Apr-2022	28 days	14 days	✓	14-Apr-2022	14 days	1 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
Amber glass/Teflon lined cap Composite soil sample	E510	30-Mar-2022	20-Apr-2022	28 days	21 days	✓	20-Apr-2022	7 days	0 days	✓	
Metals : Metals in Soil/Solid by CRC ICPMS											
Amber glass/Teflon lined cap Composite soil sample	E440	30-Mar-2022	20-Apr-2022	180 days	21 days	✓	20-Apr-2022	159 days	0 days	✓	



Matrix: **Soil/Solid**

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Particle Size : CSSC Particle Size Classification by Hydrometer											
LDPE bag Composite soil sample	E180	30-Mar-2022	----	----	----		04-Apr-2022	365 days	5 days	✓	
Physical Tests : Moisture Content by Gravimetry											
Amber glass/Teflon lined cap Composite soil sample	E144	30-Mar-2022	----	----	----		12-Apr-2022	----	----		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
Amber glass/Teflon lined cap Composite soil sample	E108	30-Mar-2022	20-Apr-2022	30 days	21 days	✓	20-Apr-2022	9 days	0 days	✓	
Physical Tests : Saturation Percentage											
Amber glass/Teflon lined cap Composite soil sample	E141	30-Mar-2022	----	----	----		20-Apr-2022	0 days	0 days	✓	
Saturated Paste Extractables : Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)											
Amber glass/Teflon lined cap Composite soil sample	E442	30-Mar-2022	----	----	----		20-Apr-2022	180 days	21 days	✓	
Saturated Paste Extractables : Chloride by IC (Saturated Paste)											
Amber glass/Teflon lined cap Composite soil sample	E239.Cl	30-Mar-2022	----	----	----		20-Apr-2022	30 days	21 days	✓	

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	461902	1	6	16.6	5.0	✔
Chloride by IC (Saturated Paste)	E239.Cl	461900	1	6	16.6	5.0	✔
CSSC Particle Size Classification by Hydrometer	E180	449343	1	6	16.6	5.0	✔
Leachable Bromide in Soil/Solid by IC	E235.Br	457015	1	8	12.5	5.0	✔
Leachable Chloride in Soil/Solid by IC	E235.Cl	457013	1	11	9.0	5.0	✔
Leachable Nitrate in Soil/Solid by IC	E235.NO3	457016	1	10	10.0	5.0	✔
Leachable Nitrite in Soil/Solid by IC	E235.NO2	457017	1	8	12.5	5.0	✔
Leachable Sulfate in Soil/Solid by IC	E235.SO4	457014	1	11	9.0	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	461897	1	15	6.6	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	461898	1	15	6.6	5.0	✔
Moisture Content by Gravimetry	E144	457020	1	10	10.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	461899	1	15	6.6	5.0	✔
Saturation Percentage	E141	461901	1	9	11.1	5.0	✔
Laboratory Control Samples (LCS)							
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	461902	2	6	33.3	10.0	✔
Chloride by IC (Saturated Paste)	E239.Cl	461900	2	6	33.3	10.0	✔
CSSC Particle Size Classification by Hydrometer	E180	449343	1	6	16.6	5.0	✔
Leachable Bromide in Soil/Solid by IC	E235.Br	457015	1	8	12.5	5.0	✔
Leachable Chloride in Soil/Solid by IC	E235.Cl	457013	1	11	9.0	5.0	✔
Leachable Nitrate in Soil/Solid by IC	E235.NO3	457016	1	10	10.0	5.0	✔
Leachable Nitrite in Soil/Solid by IC	E235.NO2	457017	1	8	12.5	5.0	✔
Leachable Sulfate in Soil/Solid by IC	E235.SO4	457014	1	11	9.0	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	461897	2	15	13.3	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	461898	2	15	13.3	10.0	✔
Moisture Content by Gravimetry	E144	457020	1	10	10.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	461899	1	15	6.6	5.0	✔
Saturation Percentage	E141	461901	2	9	22.2	10.0	✔
Method Blanks (MB)							
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442	461902	1	6	16.6	5.0	✔
Chloride by IC (Saturated Paste)	E239.Cl	461900	1	6	16.6	5.0	✔
Leachable Bromide in Soil/Solid by IC	E235.Br	457015	1	8	12.5	5.0	✔
Leachable Chloride in Soil/Solid by IC	E235.Cl	457013	1	11	9.0	5.0	✔
Leachable Nitrate in Soil/Solid by IC	E235.NO3	457016	1	10	10.0	5.0	✔
Leachable Nitrite in Soil/Solid by IC	E235.NO2	457017	1	8	12.5	5.0	✔
Leachable Sulfate in Soil/Solid by IC	E235.SO4	457014	1	11	9.0	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	461897	1	15	6.6	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	461898	1	15	6.6	5.0	✔



Matrix: **Soil/Solid**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
Moisture Content by Gravimetry	E144	457020	1	10	10.0	5.0	✓
Saturation Percentage	E141	461901	1	9	11.1	5.0	✓
<i>Matrix Spikes (MS)</i>							
Leachable Bromide in Soil/Solid by IC	E235.Br	457015	1	8	12.5	5.0	✓
Leachable Chloride in Soil/Solid by IC	E235.Cl	457013	1	11	9.0	5.0	✓
Leachable Nitrate in Soil/Solid by IC	E235.NO3	457016	1	10	10.0	5.0	✓
Leachable Nitrite in Soil/Solid by IC	E235.NO2	457017	1	8	12.5	5.0	✓
Leachable Sulfate in Soil/Solid by IC	E235.SO4	457014	1	11	9.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^\circ\text{C}$) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Saturation Percentage	E141 Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/AER D50	Saturation Percentage (SP) is determined as the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage.
Moisture Content by Gravimetry	E144 Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C . Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
CSSC Particle Size Classification by Hydrometer	E180 Saskatoon - Environmental	Soil/Solid	CCME Vol 4 Analytical Methods	A soil sample is disaggregated to pass a 2mm sieve. The $<2\text{mm}$ specimen is then further disaggregated using Calgon solution and suspended in solution. Two hydrometer readings are measured at specific times to determine %clay and %silt+clay using the principles of Stokes' law. %silt and %sand are determined mathematically.
Leachable Bromide in Soil/Solid by IC	E235.Br Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Leachable Chloride in Soil/Solid by IC	E235.Cl Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Leachable Nitrite in Soil/Solid by IC	E235.NO2 Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Leachable Nitrate in Soil/Solid by IC	E235.NO3 Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Leachable Sulfate in Soil/Solid by IC	E235.SO4 Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chloride by IC (Saturated Paste)	E239.Cl Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Ca, K, Mg, and Na by CRC ICPMS (Saturated Paste, mg/L)	E442 Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium and Sodium by Collision/Reaction Cell ICPMS as per "Soil Sampling Methods of Analysis" By M Carter.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl, followed by CVAAS analysis.
Chloride by IC (Saturated Paste) (mg/kg)	EC239A.Cl Vancouver - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/EPA 300.1 (mod)	Inorganic anions are analyzed by obtaining a soil extract produced by the saturated paste extraction procedure which is then analyzed by Ion Chromatography with conductivity and/or UV detection.
Ca, K, Mg, Na by ICPMS (Saturated Paste, mg/kg)	EC442 Vancouver - Environmental	Soil/Solid	CSSS CH15/EPA 6020B (mod)	A soil extract produced by the saturated paste extraction procedure is analyzed for Calcium, Magnesium, Potassium, Sodium by ICPMS.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
Leach for Metals and Anions	EP441 Vancouver - Environmental	Soil/Solid	In-House	This analysis is carried out using a leaching procedure which involves the gentle tumbling of the sample in a specified leaching solution (typically deionized water) for a specific length of time.

Page : 10 of 10
Work Order : VA22A6757
Client : Regional District of Kitimat-Stikine
Project : Hazelton Soil - Composite Sample



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dry and Grind	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

QUALITY CONTROL REPORT

Work Order : **VA22A6757**

Page : 1 of 11

Client : Regional District of Kitimat-Stikine
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Soil - Composite Sample
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Q62338
No. of samples received : 1
No. of samples analysed : 1

Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 31-Mar-2022 22:00
Date Analysis Commenced : 04-Apr-2022
Issue Date : 21-Apr-2022 15:23

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Xihua Yao	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan

Page : 2 of 11
Work Order : VA22A6757
Client : Regional District of Kitimat-Stikine
Project : Hazelton Soil - Composite Sample



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil/Solid

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 457020)											
VA22A6412-001	Anonymous	moisture	----	E144	0.25	%	7.60	7.74	1.80%	20%	----
Physical Tests (QC Lot: 461899)											
VA22A7145-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.97	8.95	0.2%	5%	----
Particle Size (QC Lot: 449343)											
RG2200275-001	Anonymous	clay (<0.002mm)	----	E180	1.0	%	27.4	26.2	4.54%	10%	----
		sand (2.0mm - 0.05mm)	----	E180	1.0	%	38.4	39.2	2.06%	10%	----
		silt (0.05mm - 0.002mm)	----	E180	1.0	%	34.2	34.6	1.20%	10%	----
Saturated Paste Extractables (QC Lot: 461900)											
VA22A6757-001	Composite soil sample	chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	29	24	5	Diff <2x LOR	----
Saturated Paste Extractables (QC Lot: 461901)											
VA22A6757-001	Composite soil sample	% saturation	----	E141	1.0	%	41.3	31.4	27.4%	20%	DUP-H
Saturated Paste Extractables (QC Lot: 461902)											
VA22A6757-001	Composite soil sample	sodium, soluble ion content	17341-25-2	E442	2.0	mg/L	13.0	12.5	0.5	Diff <2x LOR	----
Metals (QC Lot: 461897)											
VA22A7145-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 461898)											
VA22A7145-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	13700	13800	0.900%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.20	0.20	0.002	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	2.86	3.62	23.4%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	73.4	73.7	0.396%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.26	0.27	0.010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.080	0.119	0.038	Diff <2x LOR	----
		calcium	7440-70-2	E440	50	mg/kg	9030	9280	2.70%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	20.4	20.0	2.21%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	7.50	7.20	4.03%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	22.5	28.5	23.6%	30%	----
		iron	7439-89-6	E440	50	mg/kg	20000	20100	0.252%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	4.67	5.33	13.1%	40%	----
lithium	7439-93-2	E440	2.0	mg/kg	8.3	8.6	0.3	Diff <2x LOR	----		



Sub-Matrix: **Soil/Solid**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 461898) - continued											
VA22A7145-001	Anonymous	magnesium	7439-95-4	E440	20	mg/kg	6460	6460	0.0710%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	373	369	1.21%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	0.38	0.42	0.03	Diff <2x LOR	----
		nickel	7440-02-0	E440	0.50	mg/kg	15.4	14.4	6.86%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	513	492	4.17%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	1190	1160	2.83%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	662	673	1.66%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	52.0	50.8	2.44%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.058	0.063	0.006	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	866	901	3.99%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.488	0.468	4.12%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	50.3	50.8	1.06%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	42.8	46.5	8.22%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	5.2	5.2	0.04	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 457013)											
VA22A6412-001	Anonymous	chloride, leachable	16887-00-6	E235.Cl	20.0	mg/kg	<20.0	<20.0	0	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 457014)											
VA22A6412-001	Anonymous	sulfate, leachable	14808-79-8	E235.SO4	10	mg/kg	16	15	0.6	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 457015)											
VA22A6412-001	Anonymous	bromide, leachable	24959-67-9	E235.Br	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 457016)											
VA22A6412-001	Anonymous	nitrate (as N), leachable	14797-55-8	E235.NO3	0.050	mg/kg	2.73	2.71	0.726%	30%	----
Leachable Anions & Nutrients (QC Lot: 457017)											
VA22A6412-001	Anonymous	nitrite (as N), leachable	14797-65-0	E235.NO2	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 457020)						
moisture	----	E144	0.25	%	<0.25	----
Saturated Paste Extractables (QCLot: 461900)						
chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	<20	----
Saturated Paste Extractables (QCLot: 461901)						
% saturation	----	E141	1	%	50.0	----
Saturated Paste Extractables (QCLot: 461902)						
sodium, soluble ion content	17341-25-2	E442	2	mg/L	<2.0	----
Metals (QCLot: 461897)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 461898)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 461898) - continued						
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
Leachable Anions & Nutrients (QCLot: 457013)						
chloride, leachable	16887-00-6	E235.Cl	5	mg/kg	<5.0	----
Leachable Anions & Nutrients (QCLot: 457014)						
sulfate, leachable	14808-79-8	E235.SO4	10	mg/kg	<10	----
Leachable Anions & Nutrients (QCLot: 457015)						
bromide, leachable	24959-67-9	E235.Br	0.5	mg/kg	<0.50	----
Leachable Anions & Nutrients (QCLot: 457016)						
nitrate (as N), leachable	14797-55-8	E235.NO3	0.05	mg/kg	<0.050	----
Leachable Anions & Nutrients (QCLot: 457017)						
nitrite (as N), leachable	14797-65-0	E235.NO2	0.01	mg/kg	<0.010	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 457020)									
moisture	---	E144	0.25	%	50 %	100	90.0	110	---
Physical Tests (QCLot: 461899)									
pH (1:2 soil:water)	---	E108	---	pH units	6 pH units	100	95.0	105	---
Saturated Paste Extractables (QCLot: 461900)									
chloride, soluble ion content	16887-00-6	E239.Cl	20	mg/L	100 mg/L	101	80.0	120	---
Saturated Paste Extractables (QCLot: 461901)									
% saturation	---	E141	1	%	100 %	96.4	80.0	120	---
Saturated Paste Extractables (QCLot: 461902)									
sodium, soluble ion content	17341-25-2	E442	2	mg/L	50 mg/L	106	80.0	120	---
Metals (QCLot: 461897)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	107	80.0	120	---
Metals (QCLot: 461898)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	104	80.0	120	---
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	102	80.0	120	---
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	101	80.0	120	---
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	---
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	102	80.0	120	---
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	98.4	80.0	120	---
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	105	80.0	120	---
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	98.6	80.0	120	---
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	104	80.0	120	---
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	101	80.0	120	---
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	97.4	80.0	120	---
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	---
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	106	80.0	120	---
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	---
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	99.8	80.0	120	---
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	105	80.0	120	---
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	103	80.0	120	---
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	98.9	80.0	120	---
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	97.0	80.0	120	---
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	108	80.0	120	---



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
						Low	High		
Metals (QCLot: 461898) - continued									
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	101	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	103	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	88.9	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	104	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.5	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	97.3	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	94.5	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	97.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	95.7	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	99.9	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	102	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	99.6	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	101	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	89.4	80.0	120	----
Leachable Anions & Nutrients (QCLot: 457013)									
chloride, leachable	16887-00-6	E235.Cl	5	mg/kg	500 mg/kg	103	70.0	130	----
Leachable Anions & Nutrients (QCLot: 457014)									
sulfate, leachable	14808-79-8	E235.SO4	10	mg/kg	500 mg/kg	105	70.0	130	----
Leachable Anions & Nutrients (QCLot: 457015)									
bromide, leachable	24959-67-9	E235.Br	0.5	mg/kg	2.5 mg/kg	106	70.0	130	----
Leachable Anions & Nutrients (QCLot: 457016)									
nitrate (as N), leachable	14797-55-8	E235.NO3	0.05	mg/kg	12.5 mg/kg	103	70.0	130	----
Leachable Anions & Nutrients (QCLot: 457017)									
nitrite (as N), leachable	14797-65-0	E235.NO2	0.01	mg/kg	2.5 mg/kg	104	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Leachable Anions & Nutrients (QCLot: 457013)										
VA22A6412-002	Anonymous	chloride, leachable	16887-00-6	E235.Cl	689 mg/kg	1000 mg/kg	104	60.0	140	----
Leachable Anions & Nutrients (QCLot: 457014)										
VA22A6412-002	Anonymous	sulfate, leachable	14808-79-8	E235.SO4	693 mg/kg	1000 mg/kg	104	60.0	140	----
Leachable Anions & Nutrients (QCLot: 457015)										
VA22A6412-002	Anonymous	bromide, leachable	24959-67-9	E235.Br	3.50 mg/kg	5 mg/kg	106	60.0	140	----
Leachable Anions & Nutrients (QCLot: 457016)										
VA22A6412-002	Anonymous	nitrate (as N), leachable	14797-55-8	E235.NO3	17.2 mg/kg	25 mg/kg	104	60.0	140	----
Leachable Anions & Nutrients (QCLot: 457017)										
VA22A6412-002	Anonymous	nitrite (as N), leachable	14797-65-0	E235.NO2	3.49 mg/kg	5 mg/kg	105	60.0	140	----



Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Particle Size (QCLot: 449343)									
QC-449343-001	RM	clay (<0.002mm)	----	E180	24.39 %	93.1	80.0	120	----
QC-449343-001	RM	sand (2.0mm - 0.05mm)	----	E180	47.72 %	96.9	90.0	110	----
QC-449343-001	RM	silt (0.05mm - 0.002mm)	----	E180	27.88 %	111	82.0	118	----
Saturated Paste Extractables (QCLot: 461900)									
QC-461900-003	RM	chloride, soluble ion content	16887-00-6	E239.Cl	1237 mg/L	87.9	70.0	130	----
Saturated Paste Extractables (QCLot: 461901)									
QC-461901-003	RM	% saturation	----	E141	48.3 %	105	70.0	130	----
Saturated Paste Extractables (QCLot: 461902)									
QC-461902-003	RM	sodium, soluble ion content	17341-25-2	E442	330 mg/L	89.7	70.0	130	----
Metals (QCLot: 461897)									
QC-461897-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	98.8	70.0	130	----
Metals (QCLot: 461898)									
QC-461898-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	110	70.0	130	----
QC-461898-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	105	70.0	130	----
QC-461898-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	104	70.0	130	----
QC-461898-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	108	70.0	130	----
QC-461898-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	110	70.0	130	----
QC-461898-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	132	40.0	160	----
QC-461898-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	103	70.0	130	----
QC-461898-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	109	70.0	130	----
QC-461898-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	114	70.0	130	----
QC-461898-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	104	70.0	130	----
QC-461898-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	104	70.0	130	----
QC-461898-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	106	70.0	130	----
QC-461898-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	104	70.0	130	----
QC-461898-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	109	70.0	130	----
QC-461898-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	108	70.0	130	----
QC-461898-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	111	70.0	130	----
QC-461898-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	103	70.0	130	----




Sub-Matrix: Soil/Solid

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report					
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier	
							Low	High		
Metals (QCLot: 461898) - continued										
QC-461898-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	103	70.0	130	----	
QC-461898-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	107	70.0	130	----	
QC-461898-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	114	70.0	130	----	
QC-461898-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	106	70.0	130	----	
QC-461898-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	101	70.0	130	----	
QC-461898-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	97.4	40.0	160	----	
QC-461898-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	104	70.0	130	----	
QC-461898-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	112	70.0	130	----	
QC-461898-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	110	70.0	130	----	
QC-461898-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	106	70.0	130	----	
QC-461898-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	108	70.0	130	----	
QC-461898-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	93.3	70.0	130	----	

Report To Contact and company name below will appear on the final report. Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nveikie@rdks.bc.ca Email 3: mglover@rdks.bc.ca		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm -business days - no surcharges apply PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs: _____ For tests that can not be performed according to the service level selected, you will be contacted.													
Invoice To Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Nicole Lavoie		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca Email 2: hshinton@rdks.bc.ca		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1" style="width:100%; height: 200px;"> <tr> <th>Metals</th> <th>Salinity</th> <th>Nutrients</th> <th>Cations</th> <th>Ions</th> <th>Soil texture analysis</th> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> </table> <div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">SAMPLES ON HOLD</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Sample is hazardous (please provide further detail)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</div> </div>		Metals	Salinity	Nutrients	Cations	Ions	Soil texture analysis	R	R	R	R	R	R
Metals	Salinity	Nutrients	Cations			Ions	Soil texture analysis										
R	R	R	R			R	R										
Project Information ALS Account # / Quote #: _____ Job #: Hazelton Soil - Composite Sample PO / AFE: _____ LSD: _____		Oil and Gas Required Fields (client use) AFE/Cost Center: _____ PO#: _____ Major/Minor Code: _____ Routing Code: _____ Requisitioner: _____ Location: _____															
ALS Lab Work Order # (lab use only): _____		ALS Contact: Amber Springer	Sampler: H.Shinton														
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type													
	Composite soil sample	30-Mar-22	2:00	Soil													

Environmental Division
Vancouver
Work Order Reference
VA22A6757

Ambeby



Telephone : +1 604 253 4168

Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 9.6 FINAL COOLER TEMPERATURES °C: 4.3, 7.8			
SHIPMENT RELEASE (client use) Released by: <i>Hannah Shinton</i> Date: <i>March 31st, 2022</i> Time: _____		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <i>Chris</i> Date: <i>31 Mar 22</i> Time: <i>0945</i>		FINAL SHIPMENT RECEPTION (lab use only) Received by: <i>RKC</i> Date: <i>3/31/22</i> Time: <i>10</i>			



CERTIFICATE OF ANALYSIS

Work Order : **VA22A6755**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton EQ LC50
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Q62338
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 2
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 31-Mar-2022 22:00
Date Analysis Commenced : 04-Apr-2022
Issue Date : 25-Apr-2022 10:42

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Paolo Obillo	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 Outlet	----	----	----	----
					Client sampling date / time	30-Mar-2022 02:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22A6755-001	Result	----	----	----	----
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A6755	Page	: 1 of 5
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 31-Mar-2022 22:00
PO	: ----	Issue Date	: 25-Apr-2022 10:42
C-O-C number	: ----		
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Bioassays : Survival/LC50 Daphnia Magna 48 hours										
HDPE Wetland 4 Outlet	DAP-LC50-48	30-Mar-2022	----	----	----		04-Apr-2022	5 days	5 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

- No Quality Control data available for this section.



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Burnaby) - 8664 Commerce Court Burnaby British Columbia Canada V5A 4N7	Water	EPS1/RM/14	See attached report.

QUALITY CONTROL REPORT

Work Order	: VA22A6755	Page	: 1 of 2
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 31-Mar-2022 22:00
PO	: ----	Date Analysis Commenced	: 04-Apr-2022
C-O-C number	: ----	Issue Date	: 25-Apr-2022 10:42
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Paolo Obillo	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia

Page : 2 of 2
Work Order : VA22A6755
Client : Regional District of Kitimat-Stikine
Project : Hazelton EQ LC50



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Acute Toxicity Test Results

Sample VA22A6755-001 Wetland 4 Outlet,
collected March 30, 2022

Final Report

April 15, 2022

Submitted to: **ALS Environmental**
Burnaby, BC

SAMPLE INFORMATION

Sample ID	Dates		<i>Daphnia magna</i> test initiation	Receipt temp.
	Collected	Received		
VA22A6755-001 Wetland 4 Outlet	30-Mar-22 at 0230h	01-Apr-22 at 1612h	04-Apr-22 at 0831h	9.4-9.6°C

TESTS

- *Daphnia magna* 48-h LC50 test

RESULTS

Toxicity test results

Sample ID	LC50 (% v/v)
VA22A6755-001 Wetland 4 Outlet	> 100

LC = Lethal Concentration

QA/QC

QA/QC summary	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	5.2 (4.2 – 6.4) g/L NaCl ¹
Reference toxicant historical mean (2 SD range)	5.2 (3.4 – 7.8) g/L NaCl
Reference toxicant CV	21%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date: April 6, 2022, LC = Lethal Concentration, SD = Standard Deviation, CL = Confidence Limits, CV = Coefficient of Variation



Report By:
Kiyeon Lee, B.Sc.
Laboratory Biologist



Reviewed By:
Edmund Canaria, R.P. Bio.
Senior Analyst

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

APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 48-h *Daphnia magna* LC50 test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24-hour old neonates
Test type	Static
Test duration	48 hours
Test vessel	250-mL glass beaker
Test volume	200 mL
Test solution depth	6 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Moderately-hard reconstituted water + 2.5 µg/L Se
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen and pH measured daily; salinity, hardness and alkalinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/14, with 2016 amendments
Statistical software	CETIS Version 2.1.1
Test endpoint	Survival (48-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Sodium chloride (NaCl)

Daphnia magna Summary Sheet

Client: ALS Environmental
Work Order No.: 220617

Start Date/Time: Apr. 4, 2022 / 0831h
Test Species: Daphnia magna
Set up by: KUL

Sample Information:

Sample ID: VA22A6755_001 wetland 4 outlet
Sample Date: Mar. 30, 2022
Date Received: Apr. 1, 2022
Sample Volume: 2 X 1L

Test Validity Criteria:
≥ 90% mean control survival and/or mobility and ≤ 2 daphnids exhibit immobility and/or mortality in any single control replicate.

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 031622A
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 22
Mortality (%) in previous 7 d: 0
Days to first brood: 7

NaCl Reference Toxicant Results:

Reference Toxicant ID: DmDC95
Stock Solution ID: 22Na01
Date Initiated: April 6, 2022
48-h LC50 (95% CL): 5.2 (4.2 - 6.4) g/L NaCl

Reference Toxicant Mean and Historical Range: 5.2 (3.4 - 7.8) g/L NaCl
Reference Toxicant CV (%): 21 %

Test Results: The 48 hr LC50 is estimated to be >100% (v/v)

Reviewed by: 

Date reviewed: April 13, 2022

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: ALS Environmental
 Sample ID: VA22A6755-001 Wetland 4 Outlet
 Work Order No.: 220617
 CER #: 5

Start Date/Time: April 4, 2022 @ 0831h
 Test Organism: D.magna
 # Organisms/volume: 10/200mL
 Set up by: KUL

Thermometer: CERIF pH meter/probe: 6 / 6 DO meter/probe: 6 / 6 Cond./Salinity meter/probe: 6 / 6

Concentration % (v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		0	24	48	0	24	48	0	24	48	0	48
control	A	10	10	0	18.5	19.5	19.0	9.0	8.4	8.5	8.0	8.0	7.9	371	373
	B														
	C														
	D														
6.25	A	10	10	0	19.0	19.5	18.5	8.9	8.5	8.5	8.0	8.0	8.0	387	390
	B														
	C														
	D														
12.5	A	10	10	0	19.0	19.5	18.5	8.9	8.4	8.5	7.9	8.0	8.0	402	405
	B														
	C														
	D														
25	A	10	10	0	19.5	19.5	18.5	8.8	8.4	8.4	7.7	7.9	8.1	433	436
	B														
	C														
	D														
50	A	10	10 10	0	19.5	19.5	18.5	8.2	8.3	8.4	7.4	7.7	8.0	496	492
	B														
	C														
	D														
100	A	10	10	0	19.0	19.5	18.5	6.7	7.5	8.0	7.0	7.5	8.1	633	614
	B														
	C														
	D														
Technician Initials		KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL	KUL

	Hardness*	Alkalinity*
Concentration	*(mg/L as CaCO ₃)	
Control (MHW)	100	90
Highest conc.	280	330
Hardness adjusted	-	

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.0		
DO (mg/L)	6.7		
pH	7.0		
Cond (µS/cm)	633		
Salinity (ppt)	0.3		

Sample Description: slightly yellow, clear liquid, brown particulates, no odor.

Comments: _____

Mortality: Heartbeat
checked under microscope N/A

Batch#: 031622A 7-d previous # young/brood: 22 Previous 7-d Mortality (%): 0 Day of 1st Brood: 7

Reviewed by: [Signature]

Date reviewed: April 13, 2022

APPENDIX B – Chain-of-custody form



Chain of Custody
 Vancouver - Environmental
 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9

PREVIEW COC

Destination Lab: **Nautilus Environmental (Burnaby)**
 Address: 8664 Commerce Court Burnaby BC
 Canada V5A 4N7
 Work Order Number: **VA22A6755**
 Original Receipt Date/Time: 01/04/2022 09:06
 Instructions Received

Relinquished By
 Date/Time
 Received By
 Date/Time
 Receipt Temp

Return as Indicated: Results: alsev.datasublet@alsglobal.com Invoice: alsev.datasublet@alsglobal.com Electronic Data: alsev.datasublet@alsglobal.com
 Attention: Amber Springer

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA22A6755-001	Wetland 4 Outlet	Water	HDPE	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	25-04-2022	30/03/2022 02:30	
VA22A6755-001	Wetland 4 Outlet	Water	HDPE			25-04-2022	30/03/2022 02:30	


Account Manager: *Amber Springer*
 ALSEV.DataSublet@ALSGlobal.com (PDF / EXCEL / B2B)
 ALS Vancouver Phone Number: 604-253-4188

9.4-9.6
 TU
 Apr. 1/22 @ 16:12
 2x1L
 220617

END OF REPORT

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)					
Company:	Regional District of Kitimat-Stikine	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply					
Contact:	Hannah Shinton	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PRIORITY (Business Days)	4 day [P4-20%]	<input type="checkbox"/>	EMERGENCY	1 Business day [E1 - 100%]	<input type="checkbox"/>
Phone:	250-641-4141	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked	Select Distribution:		3 day [P3-25%]	<input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 - 200%]	<input type="checkbox"/>
Company address below will appear on the final report		Email 1 or Fax	eblaney@rdks.bc.ca	Date and Time Required for all E&P TATs:					
Street:	4545 Lazelle Avenue	Email 2	hshinton@rdks.bc.ca	For tests that can not be performed according to the service level selected, you will be contacted.					
City/Province:	Terrace/BC	Email 3	nlavoie@rdks.bc.ca	Analysis Request					
Postal Code:	V8G4E1	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below					
Invoice To	Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:		<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX					
	Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Email 1 or Fax		Acute toxicity LC50 Dechlorina magna					
Company:	Regional District of Kitimat-Stikine	Email 2		Sample in hazardous (please provide further detail)					
Contact:	Nicole Lavoie	Email 2		NUMBER OF CONTAINERS					
Project Information		Oil and Gas Required Fields (client use)							
ALS Account # / Quote #:		AFE/Cost Center:	PO#						
Job #:	Hazleton EQ LC50	Major/Minor Code:	Routing Code:						
PO / AFE:		Requisitioner:							
LSD:		Location:							
ALS Lab Work Order # (lab use only):		ALS Contact:	Amber Springer	Sampler:	H.Shinton				
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type					
	Wetland 4 Outlet	30-MAR-22	2:30	Effluent	R				
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)					
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)		Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>					
Are samples for human consumption? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>					
				Cooling Initiated <input type="checkbox"/>					
				INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
				3.0			4.3 7.8		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)					
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	
Hannah Shinton	March 31 st 2022		Chris	31 Mar 22	09:45	RKC	3/31/22	10M	

Environmental Division
Vancouver
Work Order Reference
VA22A6755



Amber

Telephone: +1 604 253 4188

CERTIFICATE OF ANALYSIS

Work Order : **VA22A6759**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Q62338
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 5
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 31-Mar-2022 09:45
Date Analysis Commenced : 02-Apr-2022
Issue Date : 11-Apr-2022 11:33

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 @ Outlet	Facility 1	Travel Blank	Field Blank	Post Sand Filter / Pre Phyto
Client sampling date / time					30-Mar-2022 14:32	30-Mar-2022 12:00	30-Mar-2022	30-Mar-2022 15:00	30-Mar-2022 13:00	
Analyte	CAS Number	Method	LOR	Unit	VA22A6759-001 Result	VA22A6759-002 Result	VA22A6759-003 Result	VA22A6759-004 Result	VA22A6759-005 Result	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	289	289	<1.0	<1.0	302	
conductivity	----	E100	2.0	µS/cm	625	623	----	<2.0	675	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	238	235	<0.60	<0.60	336	
pH	----	E108	0.10	pH units	8.06	8.06	----	----	7.90	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	3.49	3.42	<0.0050	<0.0050	9.43	
chloride	16887-00-6	E235.Cl	0.50	mg/L	32.4	32.4	<0.50	<0.50	38.6	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.091	0.091	<0.020	<0.020	<0.100 ^{DLDS}	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	4.04	4.05	----	----	9.65	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.216	0.213	----	----	0.0266	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0217	0.0216	----	----	<0.0050 ^{DLDS}	
nitrogen, total	7727-37-9	E366	0.030	mg/L	4.61	4.57	<0.030	<0.030	10.4	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0044	0.0040	<0.0010 ^{HTD}	<0.0010	0.0018	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	8.36	8.36	<0.30	<0.30	13.6	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	9.44	9.98	----	----	21.7	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	9.53	10.2	----	----	24.9	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0605	0.0560	<0.0030	<0.0030	0.0419	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00023	0.00023	<0.00010	<0.00010	0.00032	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00246	0.00237	<0.00010	<0.00010	0.0240	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0937	0.0967	<0.00010	<0.00010	0.196	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000100 ^{DIA}	
boron, total	7440-42-8	E420	0.010	mg/L	0.327	0.330	<0.010	<0.010	0.532	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000119	0.0000139	<0.0000050	<0.0000050	0.0000264	
calcium, total	7440-70-2	E420	0.050	mg/L	68.4	68.2	<0.050	<0.050	96.4	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000023	0.000022	<0.000010	<0.000010	0.000028	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00109	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00150	0.00147	<0.00010	<0.00010	0.00543	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 @ Outlet	Facility 1	Travel Blank	Field Blank	Post Sand Filter / Pre Phyto
Client sampling date / time					30-Mar-2022 14:32	30-Mar-2022 12:00	30-Mar-2022	30-Mar-2022 15:00	30-Mar-2022 13:00	
Analyte	CAS Number	Method	LOR	Unit	VA22A6759-001	VA22A6759-002	VA22A6759-003	VA22A6759-004	VA22A6759-005	
					Result	Result	Result	Result	Result	
Total Metals										
copper, total	7440-50-8	E420	0.00050	mg/L	0.00084	0.00080	<0.00050	<0.00050	<0.00100	DLA
iron, total	7439-89-6	E420	0.010	mg/L	0.360	0.353	<0.010	<0.010	10.5	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000214	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	DLA
magnesium, total	7439-95-4	E420	0.0050	mg/L	16.2	15.7	<0.0050	<0.0050	23.2	
manganese, total	7439-96-5	E420	0.00010	mg/L	1.43	1.41	<0.00010	<0.00010	8.00	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000066	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000902	0.000914	<0.000050	<0.000050	0.00170	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00344	0.00354	<0.00050	<0.00050	0.00472	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	0.217	
potassium, total	7440-09-7	E420	0.050	mg/L	7.66	7.89	<0.050	<0.050	12.7	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00134	0.00142	<0.00020	<0.00020	0.00134	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000086	0.000058	<0.000050	<0.000050	0.000102	
silicon, total	7440-21-3	E420	0.10	mg/L	3.85	3.82	<0.10	<0.10	7.31	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	DLA
sodium, total	7440-23-5	E420	0.050	mg/L	32.3	31.8	<0.050	<0.050	52.6	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.430	0.442	<0.00020	<0.00020	0.683	
sulfur, total	7704-34-9	E420	0.50	mg/L	3.55	3.58	<0.50	<0.50	3.34	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040	DLA
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	DLA
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	DLA
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	DLA
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00142	0.00110	<0.00030	<0.00030	0.00154	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	DLA
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000286	0.000287	<0.000010	<0.000010	0.000233	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00195	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	0.0481	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040	DLA
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	----	<2.0	7.6	DLA
chemical oxygen demand [COD]	----	E559	20	mg/L	56	34	----	----	101	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 @ Outlet	Facility 1	Travel Blank	Field Blank	Post Sand Filter / Pre Phyto
Client sampling date / time					30-Mar-2022 14:32	30-Mar-2022 12:00	30-Mar-2022	30-Mar-2022 15:00	30-Mar-2022 13:00	
Analyte	CAS Number	Method	LOR	Unit	VA22A6759-001	VA22A6759-002	VA22A6759-003	VA22A6759-004	VA22A6759-005	
					Result	Result	Result	Result	Result	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	4.49	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	<0.40	<0.40	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	<0.30	<0.30	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	<0.50	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	89.6	89.3	----	88.3	89.9	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	102	95.3	----	102	103	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	<250	<250	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	<250	<250	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	<100	<100	
VPHw	----	EC580A	100	µg/L	<100	<100	----	<100	<100	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	108	105	----	92.7	97.4	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	102	102	----	107	105	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22A6759	Page	: 1 of 19
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 31-Mar-2022 09:45
PO	: ----	Issue Date	: 11-Apr-2022 11:33
C-O-C number	: ----		
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Facility 1	E550	30-Mar-2022	----	----	----		02-Apr-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Field Blank	E550	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	65 hrs	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Wetland 4 @ Outlet	E550	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	66 hrs	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Post Sand Filter / Pre Phyto	E550	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	67 hrs	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry											
Amber glass total (sulfuric acid) Facility 1	E559	30-Mar-2022	----	----	----		05-Apr-2022	28 days	6 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry											
Amber glass total (sulfuric acid) Post Sand Filter / Pre Phyto	E559	30-Mar-2022	----	----	----		05-Apr-2022	28 days	6 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E559	30-Mar-2022	----	----	----		05-Apr-2022	28 days	6 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	10 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Facility 1	E298	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Field Blank	E298	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Post Sand Filter / Pre Phyto	E298	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E298	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Facility 1	E235.Cl	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Field Blank	E235.Cl	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Post Sand Filter / Pre Phyto	E235.Cl	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Travel Blank	E235.Cl	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE Wetland 4 @ Outlet	E235.Cl	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE Facility 1	E378-U	30-Mar-2022	----	----	----		02-Apr-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE Travel Blank	E378-U	30-Mar-2022	----	----	----		02-Apr-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE Field Blank	E378-U	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	67 hrs	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE Wetland 4 @ Outlet	E378-U	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	67 hrs	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)										
HDPE Post Sand Filter / Pre Phyto	E378-U	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	69 hrs	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Facility 1	E235.F	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Field Blank	E235.F	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Post Sand Filter / Pre Phyto	E235.F	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE Travel Blank	E235.F	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Wetland 4 @ Outlet	E235.F	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Facility 1	E235.NO3-L	30-Mar-2022	----	----	----		02-Apr-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO3-L	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	66 hrs	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Post Sand Filter / Pre Phyto	E235.NO3-L	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	67 hrs	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Facility 1	E235.NO2-L	30-Mar-2022	----	----	----		02-Apr-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO2-L	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	66 hrs	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Post Sand Filter / Pre Phyto	E235.NO2-L	30-Mar-2022	----	----	----		02-Apr-2022	72 hrs	67 hrs	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Facility 1	E235.SO4	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE Field Blank	E235.SO4	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Post Sand Filter / Pre Phyto	E235.SO4	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Travel Blank	E235.SO4	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Wetland 4 @ Outlet	E235.SO4	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Facility 1	E318	30-Mar-2022	07-Apr-2022	----	----		10-Apr-2022	28 days	11 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Post Sand Filter / Pre Phyto	E318	30-Mar-2022	07-Apr-2022	----	----		10-Apr-2022	28 days	11 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E318	30-Mar-2022	07-Apr-2022	----	----		10-Apr-2022	28 days	11 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Travel Blank	E366	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	10 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Facility 1	E366	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Field Blank	E366	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Post Sand Filter / Pre Phyto	E366	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E366	30-Mar-2022	07-Apr-2022	----	----		08-Apr-2022	28 days	9 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Facility 1	E601A	30-Mar-2022	08-Apr-2022	14 days	9 days	✓	09-Apr-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	30-Mar-2022	08-Apr-2022	14 days	9 days	✓	09-Apr-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Post Sand Filter / Pre Phyto	E601A	30-Mar-2022	08-Apr-2022	14 days	9 days	✓	09-Apr-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 4 @ Outlet	E601A	30-Mar-2022	08-Apr-2022	14 days	9 days	✓	09-Apr-2022	40 days	1 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Facility 1	E581.VH+F1	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Post Sand Filter / Pre Phyto	E581.VH+F1	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E581.VH+F1	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Facility 1	E358-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Post Sand Filter / Pre Phyto	E358-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Wetland 4 @ Outlet	E358-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Facility 1	E355-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Post Sand Filter / Pre Phyto	E355-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E355-L	30-Mar-2022	07-Apr-2022	----	----		07-Apr-2022	28 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Facility 1	E290	30-Mar-2022	----	----	----		02-Apr-2022	14 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE Field Blank	E290	30-Mar-2022	----	----	----		02-Apr-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Post Sand Filter / Pre Phyto	E290	30-Mar-2022	----	----	----		02-Apr-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	30-Mar-2022	----	----	----		02-Apr-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Wetland 4 @ Outlet	E290	30-Mar-2022	----	----	----		02-Apr-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Facility 1	E100	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Field Blank	E100	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Post Sand Filter / Pre Phyto	E100	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Wetland 4 @ Outlet	E100	30-Mar-2022	----	----	----		02-Apr-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE Wetland 4 @ Outlet	E108	30-Mar-2022	----	----	----		02-Apr-2022	0.25 hrs	66 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE Post Sand Filter / Pre Phyto	E108	30-Mar-2022	----	----	----		02-Apr-2022	0.25 hrs	67 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE Facility 1	E108	30-Mar-2022	----	----	----		02-Apr-2022	0.25 hrs	68 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	30-Mar-2022	----	----	----		06-Apr-2022	28 days	6 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Facility 1	E508	30-Mar-2022	----	----	----		06-Apr-2022	28 days	7 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Post Sand Filter / Pre Phyto	E508	30-Mar-2022	----	----	----		06-Apr-2022	28 days	7 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) Travel Blank	E508	30-Mar-2022	----	----	----		06-Apr-2022	28 days	7 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 4 @ Outlet	E508	30-Mar-2022	----	----	----		06-Apr-2022	28 days	7 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Facility 1	E420	30-Mar-2022	----	----	----		07-Apr-2022	180 days	8 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	30-Mar-2022	----	----	----		07-Apr-2022	180 days	8 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Post Sand Filter / Pre Phyto	E420	30-Mar-2022	----	----	----		07-Apr-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Wetland 4 @ Outlet	E420	30-Mar-2022	----	----	----		07-Apr-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Travel Blank	E420	30-Mar-2022	----	----	----		07-Apr-2022	180 days	9 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Facility 1	E611A	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Field Blank	E611A	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Post Sand Filter / Pre Phyto	E611A	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E611A	30-Mar-2022	08-Apr-2022	----	----		08-Apr-2022	14 days	9 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	448620	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	452839	1	19	5.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448695	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	453345	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	450555	2	21	9.5	5.0	✓
Chloride in Water by IC	E235.Cl	448612	1	20	5.0	5.0	✓
Conductivity in Water	E100	448619	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	452836	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	448621	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	448611	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	448614	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	448615	1	18	5.5	5.0	✓
pH by Meter	E108	448618	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	448616	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	452835	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	451127	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	452298	2	38	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	452840	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	452837	1	10	10.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	453344	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	448620	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	452839	1	19	5.2	5.0	✓
BC PHCs - EPH by GC-FID	E601A	453852	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448695	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	453345	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	450555	2	21	9.5	5.0	✓
Chloride in Water by IC	E235.Cl	448612	1	20	5.0	5.0	✓
Conductivity in Water	E100	448619	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	452836	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	448621	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	448611	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	448614	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	448615	1	18	5.5	5.0	✓
pH by Meter	E108	448618	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	448616	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	452835	1	8	12.5	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Mercury in Water by CVAAS	E508	451127	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	452298	2	38	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	452840	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	452837	1	10	10.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	453344	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	448620	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	452839	1	19	5.2	5.0	✓
BC PHCs - EPH by GC-FID	E601A	453852	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	448695	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	453345	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	450555	2	21	9.5	5.0	✓
Chloride in Water by IC	E235.Cl	448612	1	20	5.0	5.0	✓
Conductivity in Water	E100	448619	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	452836	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	448621	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	448611	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	448614	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	448615	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	448616	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	452835	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	451127	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	452298	3	38	7.8	5.0	✓
Total Nitrogen by Colourimetry	E366	452840	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	452837	1	10	10.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	453344	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	452839	1	19	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	453345	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	450555	1	21	4.7	5.0	*
Chloride in Water by IC	E235.Cl	448612	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	452836	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	448621	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	448611	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	448614	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	448615	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	448616	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	452835	1	8	12.5	5.0	✓
Total Mercury in Water by CVAAS	E508	451127	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	452298	2	38	5.2	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	452840	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	452837	1	10	10.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	453344	1	20	5.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559 Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

Page : 19 of 19
Work Order : VA22A6759
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22A6759	Page	: 1 of 18
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 31-Mar-2022 09:45
PO	: ----	Date Analysis Commenced	: 02-Apr-2022
C-O-C number	: ----	Issue Date	: 11-Apr-2022 11:33
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Q62338		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia

Page : 2 of 18
Work Order : VA22A6759
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 448618)											
FJ2200789-001	Anonymous	pH	----	E108	0.10	pH units	8.50	8.50	0.0235%	4%	----
Physical Tests (QC Lot: 448619)											
FJ2200789-001	Anonymous	conductivity	----	E100	2.0	µS/cm	498	493	1.01%	10%	----
Physical Tests (QC Lot: 448620)											
FJ2200789-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	212	212	0.283%	20%	----
Anions and Nutrients (QC Lot: 448611)											
FJ2200789-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.136	0.135	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 448612)											
FJ2200789-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	16.7	16.8	0.316%	20%	----
Anions and Nutrients (QC Lot: 448614)											
FJ2200789-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	2.31	2.31	0.127%	20%	----
Anions and Nutrients (QC Lot: 448615)											
FJ2200789-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0031	0.0031	0.00002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 448616)											
FJ2200789-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	30.8	30.8	0.0339%	20%	----
Anions and Nutrients (QC Lot: 448621)											
FJ2200789-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0156	0.0156	0.253%	20%	----
Anions and Nutrients (QC Lot: 452835)											
CG2203734-005	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	4.56	4.75	4.24%	20%	----
Anions and Nutrients (QC Lot: 452839)											
FJ2200796-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.440	0.446	1.36%	20%	----
Anions and Nutrients (QC Lot: 452840)											
VA22A6606-006	Anonymous	nitrogen, total	7727-37-9	E366	3.00	mg/L	79.6	71.5	10.6%	20%	----
Organic / Inorganic Carbon (QC Lot: 452836)											
FJ2200796-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.36	2.45	0.08	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 452837)											
FJ2200796-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.22	2.32	0.10	Diff <2x LOR	----
Total Metals (QC Lot: 451127)											
VA22A6655-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 452298)											
VA22A6606-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0038	0.0042	0.0004	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 452298) - continued											
VA22A6606-001	Anonymous	antimony, total	7440-36-0	E420	0.00010	mg/L	0.0218	0.0213	2.19%	20%	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00217	0.00225	3.43%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0265	0.0259	2.53%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.630	0.623	1.17%	20%	----
		cadmium, total	7440-43-9	E420	0.0000200	mg/L	<0.0000200	<0.0000200	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	81.5	80.9	0.748%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.0151	0.0150	1.18%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	0.00067	0.00060	0.00007	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00063	0.00062	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00083	0.00083	0.000002	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.096	0.095	0.0010	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000145	0.000144	0.0000003	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.554	0.556	0.275%	20%	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	5.49	5.42	1.40%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0649	0.0650	0.169%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0406	0.0399	1.89%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00125	0.00125	0.0000003	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.055	0.056	0.001	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	67.0	65.5	2.31%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0980	0.0970	1.01%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.00548	0.00559	1.98%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	0.75	0.74	0.006	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	0.000016	0.000017	0.000002	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	274	272	0.525%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.31	1.30	0.921%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	217	218	0.317%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00021	0.00021	0.0000009	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000209	0.000215	2.44%	20%	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00090	mg/L	<0.00090	0.00066	0.00023	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00357	0.00363	1.64%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000876	0.000863	1.43%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 452298) - continued											
VA22A6606-001	Anonymous	vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 452528)											
VA22A6771-011	Anonymous	aluminum, total	7429-90-5	E420	0.0060	mg/L	0.0083	0.0088	0.0005	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00020	mg/L	0.00030	0.00030	0.000002	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00020	mg/L	0.0201	0.0194	3.70%	20%	----
		beryllium, total	7440-41-7	E420	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000250	mg/L	<0.0000250	<0.0000150	0.0000100	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.100	mg/L	334	342	2.10%	20%	----
		cesium, total	7440-46-2	E420	0.000020	mg/L	0.000246	0.000246	0.0479%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00020	mg/L	0.00040	0.00040	0.000005	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.020	mg/L	1.66	1.67	0.885%	20%	----
		lead, total	7439-92-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0020	mg/L	0.106	0.108	1.93%	20%	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	228	228	0.0353%	20%	----
		manganese, total	7439-96-5	E420	0.00020	mg/L	0.0789	0.0786	0.396%	20%	----
		molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.0260	0.0261	0.142%	20%	----
		nickel, total	7440-02-0	E420	0.00100	mg/L	0.00621	0.00594	0.00027	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.100	mg/L	0.151	0.175	0.024	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	8.48	8.47	0.0858%	20%	----
		rubidium, total	7440-17-7	E420	0.00040	mg/L	0.0117	0.0119	1.46%	20%	----
		selenium, total	7782-49-2	E420	0.100	mg/L	31.1 µg/L	0.0319	2.68%	20%	----
		silicon, total	7440-21-3	E420	0.20	mg/L	2.31	2.47	7.06%	20%	----
		silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.100	mg/L	25.8	26.6	2.93%	20%	----
		strontium, total	7440-24-6	E420	0.00040	mg/L	0.256	0.250	2.36%	20%	----
		sulfur, total	7704-34-9	E420	1.00	mg/L	423	430	1.73%	20%	----
		tellurium, total	13494-80-9	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 452528) - continued											
VA22A6771-011	Anonymous	thorium, total	7440-29-1	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000020	mg/L	0.0131	0.0132	0.721%	20%	----
		vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 448695)											
VA22A6743-002	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 450555)											
VA22A6057-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	42	40	2	Diff <2x LOR	----
Aggregate Organics (QC Lot: 450556)											
VA22A6759-005	Post Sand Filter / Pre Phyto	chemical oxygen demand [COD]	----	E559	20	mg/L	101	109	7	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 453345)											
KS2201038-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	2.86	2.63	8.29%	30%	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	0.65	0.61	0.04	Diff <2x LOR	----
Hydrocarbons (QC Lot: 453344)											
KS2201038-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 448619)						
conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 448620)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 448611)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 448612)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 448614)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 448615)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 448616)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 448621)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 452835)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 452839)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 452840)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Organic / Inorganic Carbon (QCLot: 452836)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 452837)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 451127)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 452298)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 452298) - continued						
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	MBRR
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 452528)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 452528) - continued						
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 452528) - continued						
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 448695)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 450555)						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
Aggregate Organics (QCLot: 450556)						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
Volatile Organic Compounds (QCLot: 453345)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 453344)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 453852)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----

Qualifiers

Qualifier	Description
MBRR	Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 448618)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 448619)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.6	90.0	110	----
Physical Tests (QCLot: 448620)									
alkalinity, total (as CaCO ₃)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 448611)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 448612)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 448614)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 448615)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 448616)									
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 448621)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 452835)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 452839)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 452840)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	108	75.0	125	----
Organic / Inorganic Carbon (QCLot: 452836)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 452837)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	112	80.0	120	----
Total Metals (QCLot: 451127)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	104	80.0	120	----
Total Metals (QCLot: 452298)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	110	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 452298) - continued									
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	107	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	99.5	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	110	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	109	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	109	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	110	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	115	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	110	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	110	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	94.2	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	110	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	113	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	96.2	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	97.3	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.2	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	105	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	99.9	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.4	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.8	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 452528)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	108	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	108	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	105	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	104	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	99.1	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	100	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	109	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	120	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	109	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	110	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	106	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.9	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	115	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	97.3	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	98.1	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	106	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				Qualifier
					Spike Concentration	Recovery (%)	Recovery Limits (%)		
					LCS	Low	High		
Total Metals (QCLot: 452528) - continued									
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Aggregate Organics (QCLot: 448695)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	97.1	85.0	115	----
Aggregate Organics (QCLot: 450555)									
chemical oxygen demand [COD]	----	E559	20	mg/L	100 mg/L	109	85.0	115	----
Aggregate Organics (QCLot: 450556)									
chemical oxygen demand [COD]	----	E559	20	mg/L	100 mg/L	109	85.0	115	----
Volatile Organic Compounds (QCLot: 453345)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	90.9	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	96.1	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	99.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	102	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	101	70.0	130	----
Hydrocarbons (QCLot: 453344)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	79.0	70.0	130	----
Hydrocarbons (QCLot: 453852)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	110	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	107	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 448611)										
VA22A6669-001	Anonymous	fluoride	16984-48-8	E235.F	20.9 mg/L	20 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 448612)										
VA22A6669-001	Anonymous	chloride	16887-00-6	E235.Cl	2050 mg/L	2000 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 448614)										
VA22A6669-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	51.2 mg/L	50 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 448615)										
VA22A6669-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	9.98 mg/L	10 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 448616)										
VA22A6669-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	2050 mg/L	2000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 448621)										
KS2201055-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.03 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 452835)										
FJ2200796-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.40 mg/L	2.5 mg/L	95.9	70.0	130	----
Anions and Nutrients (QCLot: 452839)										
FJ2200796-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 452840)										
VA22A6656-001	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 452836)										
FJ2200796-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.14 mg/L	5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 452837)										
FJ2200796-002	Anonymous	carbon, total organic [TOC]	----	E355-L	5.55 mg/L	5 mg/L	111	70.0	130	----
Total Metals (QCLot: 451127)										
VA22A6736-004	Anonymous	mercury, total	7439-97-6	E508	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Total Metals (QCLot: 452298)										
VA22A6606-002	Anonymous	aluminum, total	7429-90-5	E420	0.199 mg/L	0.2 mg/L	99.7	70.0	130	----
		antimony, total	7440-36-0	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 452298) - continued										
VA22A6606-002	Anonymous	beryllium, total	7440-41-7	E420	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00868 mg/L	0.01 mg/L	86.8	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	ND mg/L	0.01 mg/L	ND	70.0	130	----
		chromium, total	7440-47-3	E420	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0191 mg/L	0.02 mg/L	95.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0181 mg/L	0.02 mg/L	90.4	70.0	130	----
		iron, total	7439-89-6	E420	1.90 mg/L	2 mg/L	95.2	70.0	130	----
		lead, total	7439-92-1	E420	0.0183 mg/L	0.02 mg/L	91.3	70.0	130	----
		lithium, total	7439-93-2	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.4 mg/L	10 mg/L	104	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E420	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		silicon, total	7440-21-3	E420	10.2 mg/L	10 mg/L	102	70.0	130	----
		silver, total	7440-22-4	E420	0.00377 mg/L	0.004 mg/L	94.3	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0360 mg/L	0.04 mg/L	90.0	70.0	130	----
		thallium, total	7440-28-0	E420	0.00351 mg/L	0.004 mg/L	87.8	70.0	130	----
		thorium, total	7440-29-1	E420	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		tin, total	7440-31-5	E420	0.0188 mg/L	0.02 mg/L	94.1	70.0	130	----
		titanium, total	7440-32-6	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		uranium, total	7440-61-1	E420	0.00372 mg/L	0.004 mg/L	93.0	70.0	130	----
		vanadium, total	7440-62-2	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		zinc, total	7440-66-6	E420	0.372 mg/L	0.4 mg/L	93.1	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0399 mg/L	0.04 mg/L	99.6	70.0	130	----
Total Metals (QCLot: 452528)										



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 452528) - continued										
VA22A6771-016	Anonymous	aluminum, total	7429-90-5	E420	0.388 mg/L	0.4 mg/L	97.1	70.0	130	----
		antimony, total	7440-36-0	E420	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		barium, total	7440-39-3	E420	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0756 mg/L	0.08 mg/L	94.5	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0174 mg/L	0.02 mg/L	87.2	70.0	130	----
		boron, total	7440-42-8	E420	0.186 mg/L	0.2 mg/L	93.1	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00763 mg/L	0.008 mg/L	95.4	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0196 mg/L	0.02 mg/L	98.3	70.0	130	----
		chromium, total	7440-47-3	E420	0.0758 mg/L	0.08 mg/L	94.8	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0364 mg/L	0.04 mg/L	91.0	70.0	130	----
		copper, total	7440-50-8	E420	0.0353 mg/L	0.04 mg/L	88.3	70.0	130	----
		iron, total	7439-89-6	E420	3.65 mg/L	4 mg/L	91.2	70.0	130	----
		lead, total	7439-92-1	E420	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		lithium, total	7439-93-2	E420	0.177 mg/L	0.2 mg/L	88.4	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0365 mg/L	0.04 mg/L	91.3	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.0718 mg/L	0.08 mg/L	89.8	70.0	130	----
		phosphorus, total	7723-14-0	E420	21.5 mg/L	20 mg/L	108	70.0	130	----
		potassium, total	7440-09-7	E420	7.12 mg/L	8 mg/L	89.0	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		selenium, total	7782-49-2	E420	0.0826 mg/L	0.08 mg/L	103	70.0	130	----
		silicon, total	7440-21-3	E420	18.9 mg/L	20 mg/L	94.4	70.0	130	----
		silver, total	7440-22-4	E420	0.00776 mg/L	0.008 mg/L	97.0	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0742 mg/L	0.08 mg/L	92.7	70.0	130	----
		thallium, total	7440-28-0	E420	0.00732 mg/L	0.008 mg/L	91.5	70.0	130	----
		thorium, total	7440-29-1	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		tin, total	7440-31-5	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		titanium, total	7440-32-6	E420	0.0798 mg/L	0.08 mg/L	99.7	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0378 mg/L	0.04 mg/L	94.4	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.008 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.194 mg/L	0.2 mg/L	97.1	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 452528) - continued										
VA22A6771-016	Anonymous	zinc, total	7440-66-6	E420	0.721 mg/L	0.8 mg/L	90.1	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0820 mg/L	0.08 mg/L	102	70.0	130	----
Aggregate Organics (QCLot: 450555)										
VA22A6689-001	Anonymous	chemical oxygen demand [COD]	----	E559	99 mg/L	100 mg/L	98.7	75.0	125	----
Volatile Organic Compounds (QCLot: 453345)										
KS2201038-002	Anonymous	benzene	71-43-2	E611A	90.2 µg/L	100 µg/L	90.2	70.0	130	----
		ethylbenzene	100-41-4	E611A	97.8 µg/L	100 µg/L	97.8	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	96.1 µg/L	100 µg/L	96.1	70.0	130	----
		styrene	100-42-5	E611A	95.1 µg/L	100 µg/L	95.1	70.0	130	----
		toluene	108-88-3	E611A	96.5 µg/L	100 µg/L	96.5	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	192 µg/L	200 µg/L	96.2	70.0	130	----
		xylene, o-	95-47-6	E611A	97.0 µg/L	100 µg/L	97.0	70.0	130	----
Hydrocarbons (QCLot: 453344)										
KS2201038-003	Anonymous	VHw (C6-C10)	----	E581.VH+F1	4540 µg/L	6310 µg/L	71.9	60.0	140	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1			Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nlavoie@rdks.bc.ca Email 3: eblaney@rdks.bc.ca;			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs:																																																																																																				
Invoice To Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Nicole Lavoie			Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca Email 2: hshinton@rdks.bc.ca			Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																																																				
Project Information ALS Account # / Quote #: AFE/Cost Center: PO# Job #: Hazelton WMF Treated Leachate at Wetland 4 Major/Minor Code: Routing Code: PO / AFE: Requisitioner: LSD: Location:			Oil and Gas Required Fields (client use)			<table border="1"> <tr> <th>Sample ID</th> <th>Total Metals</th> <th>Alkalinity</th> <th>Chloride, Fluoride, Sulphate, Hardness</th> <th>Total Nitrogen</th> <th>Ammonia</th> <th>Nitrate, Nitrite</th> <th>Dissolved Organic Carbon</th> <th>TOC</th> <th>Orthophosphorus</th> <th>COD</th> <th>pH</th> <th>BOD & Conductivity</th> <th>Total Kjeldahl Nitrogen</th> <th>EPH</th> <th>BTEX/PH</th> <th>SAMPLES ON HOLD</th> <th>Sample is hazardous (please provide further detail)</th> <th>NUMBER OF CONTAINERS</th> </tr> <tr> <td>Wetland 4 @ Outlet Facility 1</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>Travel Blank</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Field Blank</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Post Sand Filter / Pre Phyto</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> </table>						Sample ID	Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	Wetland 4 @ Outlet Facility 1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				Travel Blank	R	R	R	R	R				R										Field Blank	R	R	R	R	R				R					R					Post Sand Filter / Pre Phyto	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
Sample ID	Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS																																																																																								
Wetland 4 @ Outlet Facility 1	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																											
Travel Blank	R	R	R	R	R				R																																																																																																	
Field Blank	R	R	R	R	R				R					R																																																																																												
Post Sand Filter / Pre Phyto	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																											
ALS Lab Work Order # (lab use only): ALS Sample # (lab use only): Sample Identification and/or Coordinates (This description will appear on the report): Date (dd-mm-yy): Time (hh:mm): Sample Type:			ALS Contact: Sampler: H. Shinton																																																																																																							
Drinking Water (DW) Samples ¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Special Instructions / Specify Criteria to (etc) British Columbia Approved and Working			Environmental Division Vancouver Work Order Reference VA22A6759 Telephone: +1 604 253 4186																																																																																																				
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: March 31st 2022 Time:			INITIAL SHIPMENT RECEPTION (lab use only) Received by: Chris Date: 31 Mar 22 Time: 0945			SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 3.2 30 FINAL COOLER TEMPERATURES °C: 4.3°C 7.8																																																																																																				
FINAL SHIPMENT RECEPTION (lab use only) Received by: RKC Date: 3/31/22 Time: 10pm																																																																																																										

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 WHITE - LABORATORY COPY YELLOW - CLIENT COPY
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



Chain of Custody (COC) / Analytical Request Form

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nlavoie@rdks.bc.ca Email 3: eblaney@rdks.bc.ca		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply PRIORITY (Business Days): 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY: 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply) <input type="checkbox"/> Date and Time Required for all E&P TATs: For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																																																									
Invoice To Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Nicole Lavoie		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca Email 2: hshinton@rdks.bc.ca		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <thead> <tr> <th>Total Metals</th> <th>Alkalinity</th> <th>Chloride, Fluoride, Sulphate, Hardness</th> <th>Total Nitrogen</th> <th>Ammonia</th> <th>Nitrate, Nitrite</th> <th>Dissolved Organic Carbon</th> <th>TOC</th> <th>Orthophosphorus</th> <th>COD</th> <th>pH</th> <th>BOD & Conductivity</th> <th>Total Kjeldahl Nitrogen</th> <th>EPH</th> <th>BTEX/PH</th> <th>SAMPLES ON HOLD</th> <th>Sample is hazardous (please provide further detail)</th> <th>NUMBER OF CONTAINERS</th> </tr> </thead> <tbody> <tr> <td>P</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>												Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	P																																																																																																											
Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS																																																																																																																												
P																																																																																																																																													
Project Information ALS Account # / Quote #: Job #: Hazelton WMF Treated Leachate at Wetland 4 PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: Major/Minor Code: Requisitioner: Location:		ALS Lab Work Order # (lab use only): ALS Contact: Sampler: H. Shinton																																																																																																																																									
ALS Sample # (lab use only) Wetland 4 @ Outlet Facility 1 Travel Blank Field Blank Post Sand Filter / Pre Phyto		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy) 30-MAR-22 30-MAR-22 30-MAR-22 30-MAR-22		Time (hh:mm) 2:32 12:00 3:00 1:00		Sample Type Effluent Water Water Effluent		<table border="1"> <thead> <tr> <th>Total Metals</th> <th>Alkalinity</th> <th>Chloride, Fluoride, Sulphate, Hardness</th> <th>Total Nitrogen</th> <th>Ammonia</th> <th>Nitrate, Nitrite</th> <th>Dissolved Organic Carbon</th> <th>TOC</th> <th>Orthophosphorus</th> <th>COD</th> <th>pH</th> <th>BOD & Conductivity</th> <th>Total Kjeldahl Nitrogen</th> <th>EPH</th> <th>BTEX/PH</th> <th>SAMPLES ON HOLD</th> <th>Sample is hazardous (please provide further detail)</th> <th>NUMBER OF CONTAINERS</th> </tr> </thead> <tbody> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td></td><td>R</td><td>R</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> </tbody> </table>												Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R	R	R				R				R	R					R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																	
Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	pH	BOD & Conductivity	Total Kjeldahl Nitrogen	EPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS																																																																																																																												
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																															
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																															
R	R	R	R	R				R				R	R																																																																																																																																
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																															
Drinking Water (DW) Samples¹ (client use): Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to (etc) British Columbia Approved and Working		Environmental Division Vancouver Work Order Reference VA22A6759 Telephone: +1 604 253 4188		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 3.2, 30 FINAL COOLER TEMPERATURES °C: 4.3, 7.8																																																																																																																																							
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: March 31st 2022 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Chris Date: 31 Mar 22 Time: 0945		FINAL SHIPMENT RECEPTION (lab use only) Received by: RKC Date: 3/31/22 Time: 10:22																																																																																																																																									



CERTIFICATE OF ANALYSIS

<p>Work Order : VA22C4642</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Treated Leachate at Wetland 4</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 5</p> <p>No. of samples analysed : 5</p>	<p>Page : 1 of 8</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby BC Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 12-Oct-2022 21:20</p> <p>Date Analysis Commenced : 13-Oct-2022</p> <p>Issue Date : 26-Oct-2022 13:14</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Organics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Effluent

Client sample ID

(Matrix: Water)

					Wetland 4 @ Weir	Wetland 2	Pre Phyto Post Sand Filter	----	----
Client sampling date / time					11-Oct-2022 11:15	11-Oct-2022 12:00	11-Oct-2022 13:00	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-001	VA22C4642-002	VA22C4642-003	-----	-----
					Result	Result	Result	----	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	297	280	256	----	----
conductivity	----	E100	2.0	µS/cm	693	700	755	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	244	248	314	----	----
pH	----	E108	0.10	pH units	8.40	8.39	8.30	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0393	0.0378	3.73	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250 ^{DLDS}	<0.250 ^{DLDS}	<0.250 ^{DLDS}	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	77.7	77.6	82.9	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.100 ^{DLDS}	<0.100 ^{DLDS}	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.13	1.17	4.76	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.112	0.107	0.0337	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 ^{DLDS}	<0.0050 ^{DLDS}	<0.0050 ^{DLDS}	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	1.20	1.18	4.81	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0012	<0.0010	0.0041	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.72	1.62	7.90	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	13.2	14.9	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	14.2	16.2	14.9	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0130	0.0147	0.0154	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00024	0.00025	0.00026	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00364	0.00363	0.00438	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.0534	0.0546	0.132	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----
boron, total	7440-42-8	E420	0.010	mg/L	0.580	0.597	0.625	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	0.0000088	0.0000378	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	62.3	64.4	91.9	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	0.000010	0.000043	----	----



Analytical Results

Sub-Matrix: Effluent

(Matrix: Water)

					Client sample ID	Wetland 4 @ Weir	Wetland 2	Pre Phyto Post Sand Filter	----	----
					Client sampling date / time	11-Oct-2022 11:15	11-Oct-2022 12:00	11-Oct-2022 13:00	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-001	VA22C4642-002	VA22C4642-003	-----	-----	
					Result	Result	Result	----	----	
Total Metals										
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00036	0.00037	0.00106	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00096	0.00089	0.00161	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	0.222	0.224	0.469	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0.000064	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	21.5	21.3	20.6	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.224	0.237	2.54	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0.0000079	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000888	0.000882	0.00214	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00490	0.00489	0.00594	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	10.2	10.3	11.3	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00112	0.00127	0.00194	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000068	0.000067	<0.000050	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	4.89	4.85	4.52	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	66.6	68.3	71.8	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.518	0.508	0.638	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	0.98	1.04	4.20	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000330	0.000342	0.000600	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0.0102	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	



Analytical Results

Sub-Matrix: Effluent

(Matrix: Water)

					Client sample ID	Wetland 4 @ Weir	Wetland 2	Pre Phyto Post Sand Filter	----	----
					Client sampling date / time	11-Oct-2022 11:15	11-Oct-2022 12:00	11-Oct-2022 13:00	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-001	VA22C4642-002	VA22C4642-003	-----	-----	
					Result	Result	Result	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	3.9	4.2	<6.0 ^{DLM}	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	48	44	48	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	----	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	----	----	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	----	----	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	----	----	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	----	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	76.9	73.5	77.5	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	101	98.0	96.1	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	90.2	89.2	88.4	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	98.0	98.0	97.5	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water					Client sample ID	Field Blank	Trip Blank	----	----	----
(Matrix: Water)					Client sampling date / time	11-Oct-2022 12:35	11-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-004	VA22C4642-005	-----	-----	-----	
					Result	Result	----	----	----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----	
conductivity	----	E100	2.0	µS/cm	<2.0	----	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	<0.60	<0.60	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<0.020	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0046 ^{RRV}	<0.0030	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.00046 ^{RRV}	<0.00010	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	Field Blank	Trip Blank	----	----	----
(Matrix: Water)					Client sampling date / time	11-Oct-2022 12:35	11-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-004	VA22C4642-005	-----	-----	-----	
					Result	Result	----	----	----	
Total Metals										
magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<0.10	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	----	----	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	----	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Field Blank	Trip Blank	----	----	----
Client sampling date / time					11-Oct-2022 12:35	11-Oct-2022	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22C4642-004	VA22C4642-005	-----	-----	-----	
					Result	Result	----	----	----	
Volatile Organic Compounds [Fuels]										
styrene	100-42-5	E611A	0.50	µg/L	<0.50	---	---	---	---	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	---	---	---	---	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	---	---	---	---	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	---	---	---	---	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	---	---	---	---	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	---	---	---	---	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	---	---	---	---	
EPH (C10-C32)	----	E601A	400	µg/L	<400	---	---	---	---	
EPH (C19-C32)	----	E601A	250	µg/L	<250	---	---	---	---	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	---	---	---	---	
VPHw	----	EC580A	100	µg/L	<100	---	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	75.8	---	---	---	---	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	90.2	---	---	---	---	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	87.2	---	---	---	---	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	97.3	---	---	---	---	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C4642</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Treated Leachate at Wetland 4</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 5</p> <p>No. of samples analysed : 5</p>	<p>Page : 1 of 21</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 12-Oct-2022 21:20</p> <p>Issue Date : 26-Oct-2022 13:14</p>
---	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Field Blank	E550	11-Oct-2022	----	----	----		13-Oct-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Pre Phyto Post Sand Filter	E550	11-Oct-2022	----	----	----		13-Oct-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Wetland 2	E550	11-Oct-2022	----	----	----		13-Oct-2022	3 days	2 days	✓
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Wetland 4 @ Weir	E550	11-Oct-2022	----	----	----		13-Oct-2022	3 days	2 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pre Phyto Post Sand Filter	E559-L	11-Oct-2022	----	----	----		21-Oct-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Wetland 2	E559-L	11-Oct-2022	----	----	----		21-Oct-2022	28 days	10 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Wetland 4 @ Weir	E559-L	11-Oct-2022	----	----	----		21-Oct-2022	28 days	10 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Pre Phyto Post Sand Filter	E298	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Wetland 2	E298	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Wetland 4 @ Weir	E298	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Field Blank	E298	11-Oct-2022	18-Oct-2022	----	----		20-Oct-2022	28 days	9 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Trip Blank	E298	11-Oct-2022	18-Oct-2022	----	----		20-Oct-2022	28 days	9 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Pre Phyto Post Sand Filter	E235.Br-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Trip Blank	E235.Br-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Field Blank	E235.Br-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Wetland 2	E235.Br-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Wetland 4 @ Weir	E235.Br-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE Pre Phyto Post Sand Filter	E235.Cl	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE Trip Blank	E235.Cl	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE Field Blank	E235.Cl	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE Wetland 2	E235.Cl	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE Wetland 4 @ Weir	E235.Cl	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)											
HDPE Trip Blank	E378-U	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	1 days	✔	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)											
HDPE Field Blank	E378-U	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Pre Phyto Post Sand Filter	E378-U	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Wetland 2	E378-U	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Wetland 4 @ Weir	E378-U	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Pre Phyto Post Sand Filter	E235.F	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Trip Blank	E235.F	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Field Blank	E235.F	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Wetland 2	E235.F	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Wetland 4 @ Weir	E235.F	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Pre Phyto Post Sand Filter	E235.NO3-L	11-Oct-2022	13-Oct-2022	3 days	1 days	✔	13-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Trip Blank	E235.NO3-L	11-Oct-2022	13-Oct-2022	3 days	1 days	✔	13-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Field Blank	E235.NO3-L	11-Oct-2022	13-Oct-2022	3 days	2 days	✔	13-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Wetland 2	E235.NO3-L	11-Oct-2022	13-Oct-2022	3 days	2 days	✔	13-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Wetland 4 @ Weir	E235.NO3-L	11-Oct-2022	13-Oct-2022	3 days	2 days	✔	13-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Pre Phyto Post Sand Filter	E235.NO2-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Trip Blank	E235.NO2-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	1 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Field Blank	E235.NO2-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Wetland 2	E235.NO2-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Wetland 4 @ Weir	E235.NO2-L	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Pre Phyto Post Sand Filter	E235.SO4	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Trip Blank	E235.SO4	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	1 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Field Blank	E235.SO4	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Wetland 2	E235.SO4	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Wetland 4 @ Weir	E235.SO4	11-Oct-2022	13-Oct-2022	----	----		13-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Pre Phyto Post Sand Filter	E318	11-Oct-2022	14-Oct-2022	----	----		15-Oct-2022	28 days	4 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Wetland 2	E318	11-Oct-2022	14-Oct-2022	----	----		15-Oct-2022	28 days	4 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Weir	E318	11-Oct-2022	14-Oct-2022	----	----		15-Oct-2022	28 days	4 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Pre Phyto Post Sand Filter	E366	11-Oct-2022	14-Oct-2022	----	----		17-Oct-2022	28 days	6 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 2	E366	11-Oct-2022	14-Oct-2022	----	----		17-Oct-2022	28 days	6 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Weir	E366	11-Oct-2022	14-Oct-2022	----	----		17-Oct-2022	28 days	6 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Field Blank	E366	11-Oct-2022	18-Oct-2022	----	----		19-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Trip Blank	E366	11-Oct-2022	18-Oct-2022	----	----		19-Oct-2022	28 days	8 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	11-Oct-2022	13-Oct-2022	14 days	2 days	✔	15-Oct-2022	40 days	2 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Pre Phyto Post Sand Filter	E601A	11-Oct-2022	13-Oct-2022	14 days	2 days	✔	15-Oct-2022	40 days	2 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 2	E601A	11-Oct-2022	13-Oct-2022	14 days	2 days	✔	15-Oct-2022	40 days	2 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 4 @ Weir	E601A	11-Oct-2022	13-Oct-2022	14 days	2 days	✔	15-Oct-2022	40 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Pre Phyto Post Sand Filter	E581.VH+F1	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Wetland 2	E581.VH+F1	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Wetland 4 @ Weir	E581.VH+F1	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Pre Phyto Post Sand Filter	E358-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Wetland 2	E358-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Wetland 4 @ Weir	E358-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Pre Phyto Post Sand Filter	E355-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Wetland 2	E355-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Wetland 4 @ Weir	E355-L	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE Pre Phyto Post Sand Filter	E290	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	14 days	6 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE Trip Blank	E290	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	14 days	6 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE Field Blank	E290	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	14 days	7 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE Wetland 2	E290	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	14 days	7 days	✔
Physical Tests : Alkalinity Species by Titration										
HDPE Wetland 4 @ Weir	E290	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	14 days	7 days	✔
Physical Tests : Conductivity in Water										
HDPE Pre Phyto Post Sand Filter	E100	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	28 days	6 days	✔
Physical Tests : Conductivity in Water										
HDPE Field Blank	E100	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	28 days	7 days	✔
Physical Tests : Conductivity in Water										
HDPE Wetland 2	E100	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	28 days	7 days	✔



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE Wetland 4 @ Weir	E100	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	28 days	7 days	✓	
Physical Tests : pH by Meter											
HDPE Pre Phyto Post Sand Filter	E108	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	0.25 hrs	117.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Wetland 2	E108	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	0.25 hrs	117.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Wetland 4 @ Weir	E108	11-Oct-2022	13-Oct-2022	----	----		17-Oct-2022	0.25 hrs	117.25 hrs	* EHTR-FM	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Pre Phyto Post Sand Filter	E508	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Trip Blank	E508	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 2	E508	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 4 @ Weir	E508	11-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	11-Oct-2022	13-Oct-2022	----	----		14-Oct-2022	180 days	3 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Pre Phyto Post Sand Filter	E420	11-Oct-2022	13-Oct-2022	----	----		14-Oct-2022	180 days	3 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Trip Blank	E420	11-Oct-2022	13-Oct-2022	----	----		14-Oct-2022	180 days	3 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Wetland 2	E420	11-Oct-2022	13-Oct-2022	----	----		14-Oct-2022	180 days	3 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Wetland 4 @ Weir	E420	11-Oct-2022	13-Oct-2022	----	----		14-Oct-2022	180 days	3 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Field Blank	E611A	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Pre Phyto Post Sand Filter	E611A	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Wetland 2	E611A	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Wetland 4 @ Weir	E611A	11-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	14 days	8 days	✔	

[Legend & Qualifier Definitions](#)

Page : 14 of 21
Work Order : VA22C4642
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	693292	1	12	8.3	5.0	✔
Ammonia by Fluorescence	E298	696380	2	32	6.2	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	693956	1	19	5.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	693298	1	8	12.5	5.0	✔
BTEX by Headspace GC-MS	E611A	704568	1	15	6.6	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708188	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	693294	1	13	7.6	5.0	✔
Conductivity in Water	E100	693291	1	12	8.3	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	696375	1	12	8.3	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	693300	1	8	12.5	5.0	✔
Fluoride in Water by IC	E235.F	693297	1	17	5.8	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	693295	1	12	8.3	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	693296	1	13	7.6	5.0	✔
pH by Meter	E108	693290	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	693293	1	13	7.6	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	696374	1	11	9.0	5.0	✔
Total Mercury in Water by CVAAS	E508	696831	2	40	5.0	5.0	✔
Total metals in Water by CRC ICPMS	E420	694167	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	696377	2	17	11.7	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	696376	1	11	9.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	704567	1	15	6.6	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	693292	1	12	8.3	5.0	✔
Ammonia by Fluorescence	E298	696380	2	32	6.2	5.0	✔
BC PHCs - EPH by GC-FID	E601A	694317	1	18	5.5	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	693956	1	19	5.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	693298	1	8	12.5	5.0	✔
BTEX by Headspace GC-MS	E611A	704568	1	15	6.6	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708188	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	693294	1	13	7.6	5.0	✔
Conductivity in Water	E100	693291	1	12	8.3	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	696375	1	12	8.3	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	693300	1	8	12.5	5.0	✔
Fluoride in Water by IC	E235.F	693297	1	17	5.8	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	693295	1	12	8.3	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	693296	1	13	7.6	5.0	✔



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
pH by Meter	E108	693290	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	693293	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	696374	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696831	2	40	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	694167	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	696377	2	17	11.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	696376	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	704567	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	693292	1	12	8.3	5.0	✓
Ammonia by Fluorescence	E298	696380	2	32	6.2	5.0	✓
BC PHCs - EPH by GC-FID	E601A	694317	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	693956	1	19	5.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	693298	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	704568	1	15	6.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708188	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	693294	1	13	7.6	5.0	✓
Conductivity in Water	E100	693291	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	696375	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	693300	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	693297	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	693295	1	12	8.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	693296	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	693293	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	696374	1	11	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	696831	2	40	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	694167	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	696377	2	17	11.7	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	696376	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	704567	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	696380	2	32	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	693298	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	704568	1	15	6.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708188	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	693294	1	13	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	696375	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	693300	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	693297	1	17	5.8	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Nitrate in Water by IC (Low Level)	E235.NO3-L	693295	1	12	8.3	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	693296	1	13	7.6	5.0	✔
Sulfate in Water by IC	E235.SO4	693293	1	13	7.6	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	696374	1	11	9.0	5.0	✔
Total Mercury in Water by CVAAS	E508	696831	2	40	5.0	5.0	✔
Total metals in Water by CRC ICPMS	E420	694167	1	19	5.2	5.0	✔
Total Nitrogen by Colourimetry	E366	696377	2	17	11.7	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	696376	1	11	9.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	704567	1	15	6.6	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22C4642	Page	: 1 of 15
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 12-Oct-2022 21:20
PO	: ----	Date Analysis Commenced	: 13-Oct-2022
C-O-C number	: ----	Issue Date	: 26-Oct-2022 13:15
Sampler	: H. Shinton ----		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Vancouver Inorganics, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Vancouver Organics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

Page : 2 of 15
Work Order : VA22C4642
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 693290)											
VA22C4583-001	Anonymous	pH	----	E108	0.10	pH units	5.37	5.42	1.00%	4%	----
Physical Tests (QC Lot: 693291)											
VA22C4583-001	Anonymous	conductivity	----	E100	2.0	µS/cm	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 693292)											
VA22C4583-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693293)											
VA22C4543-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	5.36	5.34	0.412%	20%	----
Anions and Nutrients (QC Lot: 693294)											
VA22C4543-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693295)											
VA22C4543-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0609	0.0594	2.50%	20%	----
Anions and Nutrients (QC Lot: 693296)											
VA22C4543-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693297)											
VA22C4543-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693298)											
VA22C4580-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 693300)											
VA22C4580-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0246	0.0238	3.40%	20%	----
Anions and Nutrients (QC Lot: 696374)											
VA22C4642-001	Wetland 4 @ Weir	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.13	1.16	2.22%	20%	----
Anions and Nutrients (QC Lot: 696377)											
VA22C4642-001	Wetland 4 @ Weir	nitrogen, total	7727-37-9	E366	0.150	mg/L	1.20	1.20	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 696380)											
VA22C4642-001	Wetland 4 @ Weir	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0393	0.0423	0.0030	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 700791)											
FJ2202934-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 700792)											
FJ2202936-001	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.181	0.165	0.016	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 696375)											



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Organic / Inorganic Carbon (QC Lot: 696375) - continued											
VA22C4642-001	Wetland 4 @ Weir	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	14.2	6.25%	20%	----
Organic / Inorganic Carbon (QC Lot: 696376)											
VA22C4642-001	Wetland 4 @ Weir	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	14.2	14.9	4.80%	20%	----
Total Metals (QC Lot: 694167)											
VA22C4567-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0154	0.0162	0.0008	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.0169	0.0168	0.532%	20%	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.161	0.161	0.313%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.00606	0.00607	0.0196%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000096	0.0000089	0.0000006	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	26.9	28.1	4.48%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000058	0.000058	0.00000009	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00187	0.00187	0.000004	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.014	0.014	0.0002	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000187	0.000185	0.000002	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0044	0.0045	0.0001	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	5.12	5.14	0.483%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00046	0.00047	0.000004	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00651	0.00641	1.52%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	2.42	2.42	0.302%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00185	0.00195	0.00010	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.00133	0.00134	0.804%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	2.65	2.64	0.318%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	0.511	0.513	0.318%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.301	0.296	1.53%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	10.8	10.7	0.304%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 694167) - continued											
VA22C4567-001	Anonymous	thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.000030	mg/L	0.000037	0.000035	0.00002	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.000010	mg/L	0.00894	0.00884	1.18%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.0150	0.0150	0.226%	20%	----
		vanadium, total	7440-62-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
Total Metals (QC Lot: 696831)											
FJ2202893-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 696832)											
VA22C4642-002	Wetland 2	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 693956)											
VA22C4498-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 708188)											
FJ2202946-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 704568)											
VA22C4642-001	Wetland 4 @ Weir	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 704567)											
VA22C4642-001	Wetland 4 @ Weir	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 693291)						
conductivity	---	E100	1	µS/cm	1.1	---
Physical Tests (QCLot: 693292)						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
Anions and Nutrients (QCLot: 693293)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 693294)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 693295)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 693296)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 693297)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 693298)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 693300)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 696374)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 696377)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	---
Anions and Nutrients (QCLot: 696380)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 700791)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 700792)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	---
Organic / Inorganic Carbon (QCLot: 696375)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 696376)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 694167)						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 694167) - continued						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 694167) - continued						
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 696831)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 696832)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 693956)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 708188)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 704568)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 694317)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 704567)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 693290)									
pH	----	E108	----	pH units	7 pH units	99.6	98.0	102	----
Physical Tests (QCLot: 693291)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 693292)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 693293)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 693294)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 693295)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 693296)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 693297)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	95.5	90.0	110	----
Anions and Nutrients (QCLot: 693298)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	98.6	85.0	115	----
Anions and Nutrients (QCLot: 693300)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	99.6	80.0	120	----
Anions and Nutrients (QCLot: 696374)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 696377)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 696380)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 700791)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 700792)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Organic / Inorganic Carbon (QCLot: 696375)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 696375) - continued									
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	8.57 mg/L	106	80.0	120	---
Organic / Inorganic Carbon (QCLot: 696376)									
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	---
Total Metals (QCLot: 694167)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	103	80.0	120	---
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	103	80.0	120	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	107	80.0	120	---
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	102	80.0	120	---
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	110	80.0	120	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	---
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	---
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	105	80.0	120	---
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	---
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	---
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	107	80.0	120	---
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	---
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	99.3	80.0	120	---
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	80.0	120	---
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.3	80.0	120	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	103	80.0	120	---
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	---
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	---
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	101	80.0	120	---
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	99.9	80.0	120	---
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.7	80.0	120	---
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	102	80.0	120	---
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	104	80.0	120	---
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	89.0	80.0	120	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	---
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	105	80.0	120	---



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 694167) - continued									
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	95.2	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.6	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	97.2	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.0	80.0	120	----
Total Metals (QCLot: 696831)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.8	80.0	120	----
Total Metals (QCLot: 696832)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	96.9	80.0	120	----
Aggregate Organics (QCLot: 693956)									
biochemical oxygen demand [BOD]	---	E550	2	mg/L	198 mg/L	99.9	85.0	115	----
Aggregate Organics (QCLot: 708188)									
chemical oxygen demand [COD]	---	E559-L	10	mg/L	100 mg/L	106	85.0	115	----
Volatile Organic Compounds (QCLot: 704568)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	105	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	109	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	107	70.0	130	----
Hydrocarbons (QCLot: 694317)									
EPH (C10-C19)	---	E601A	250	µg/L	6491 µg/L	96.7	70.0	130	----
EPH (C19-C32)	---	E601A	250	µg/L	3363 µg/L	99.4	70.0	130	----
TEH (C10-C30), BC	---	E601A	250	µg/L	9202 µg/L	97.8	70.0	130	----
Hydrocarbons (QCLot: 704567)									
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	6310 µg/L	84.0	70.0	130	----

Page : 12 of 15
Work Order : VA22C4642
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 693293)										
VA22C4583-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 693294)										
VA22C4583-001	Anonymous	chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 693295)										
VA22C4560-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.64 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 693296)										
VA22C4583-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.502 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 693297)										
VA22C4560-001	Anonymous	fluoride	16984-48-8	E235.F	1.04 mg/L	1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 693298)										
VA22C4583-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.506 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 693300)										
VA22C4583-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0328 mg/L	0.03 mg/L	109	70.0	130	----
Anions and Nutrients (QCLot: 696374)										
VA22C4642-002	Wetland 2	Kjeldahl nitrogen, total [TKN]	----	E318	2.54 mg/L	2.5 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 696377)										
VA22C4642-002	Wetland 2	nitrogen, total	7727-37-9	E366	1.88 mg/L	2 mg/L	93.9	70.0	130	----
Anions and Nutrients (QCLot: 696380)										
VA22C4642-002	Wetland 2	ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 700791)										
FJ2202934-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100 mg/L	0.1 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 700792)										
FJ2202936-002	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 696375)										
VA22C4642-002	Wetland 2	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 696376)										
VA22C4642-002	Wetland 2	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 694167)										
VA22C4567-002	Anonymous	aluminum, total	7429-90-5	E420	0.198 mg/L	0.2 mg/L	99.1	70.0	130	----
		antimony, total	7440-36-0	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, total	7440-38-2	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, total	7440-39-3	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00986 mg/L	0.01 mg/L	98.6	70.0	130	----
		boron, total	7440-42-8	E420	0.099 mg/L	0.1 mg/L	98.8	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00393 mg/L	0.004 mg/L	98.2	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		chromium, total	7440-47-3	E420	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		copper, total	7440-50-8	E420	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		iron, total	7439-89-6	E420	1.97 mg/L	2 mg/L	98.3	70.0	130	----
		lead, total	7439-92-1	E420	0.0189 mg/L	0.02 mg/L	94.5	70.0	130	----
		lithium, total	7439-93-2	E420	0.0960 mg/L	0.1 mg/L	96.0	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		nickel, total	7440-02-0	E420	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.3 mg/L	10 mg/L	103	70.0	130	----
		potassium, total	7440-09-7	E420	3.75 mg/L	4 mg/L	93.8	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		selenium, total	7782-49-2	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		silicon, total	7440-21-3	E420	9.05 mg/L	10 mg/L	90.5	70.0	130	----
		silver, total	7440-22-4	E420	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		sodium, total	7440-23-5	E420	2.07 mg/L	2 mg/L	104	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	19.7 mg/L	20 mg/L	98.5	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		thallium, total	7440-28-0	E420	0.00382 mg/L	0.004 mg/L	95.5	70.0	130	----
		thorium, total	7440-29-1	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E420	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		titanium, total	7440-32-6	E420	0.0376 mg/L	0.04 mg/L	94.1	70.0	130	----
		tungsten, total	7440-33-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----

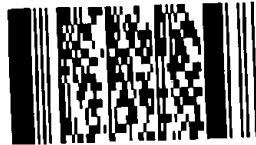


Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 694167) - continued										
VA22C4567-002	Anonymous	uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E420	0.397 mg/L	0.4 mg/L	99.4	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
Total Metals (QCLot: 696831)										
FJ2202893-002	Anonymous	mercury, total	7439-97-6	E508	0.0000990 mg/L	0.0001 mg/L	99.0	70.0	130	----
Total Metals (QCLot: 696832)										
VA22C4642-003	Pre Phyto Post Sand Filter	mercury, total	7439-97-6	E508	0.0000933 mg/L	0.0001 mg/L	93.3	70.0	130	----
Aggregate Organics (QCLot: 708188)										
FJ2202966-003	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 704568)										
VA22C4642-001	Wetland 4 @ Weir	benzene	71-43-2	E611A	99.0 µg/L	100 µg/L	99.0	60.0	140	----
		ethylbenzene	100-41-4	E611A	97.8 µg/L	100 µg/L	97.8	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	99.2 µg/L	100 µg/L	99.2	60.0	140	----
		styrene	100-42-5	E611A	99.8 µg/L	100 µg/L	99.8	60.0	140	----
		toluene	108-88-3	E611A	95.8 µg/L	100 µg/L	95.8	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	204 µg/L	200 µg/L	102	60.0	140	----
		xylene, o-	95-47-6	E611A	102 µg/L	100 µg/L	102	60.0	140	----
Hydrocarbons (QCLot: 704567)										
VA22C4642-002	Wetland 2	VHw (C6-C10)	----	E581.VH+F1	5210 µg/L	6310 µg/L	82.6	60.0	140	----

Main form containing Report To, Report Format, Analysis Request, Project Information, and Sample Data tables. Includes sections for shipping, reception, and sample condition.

Environmental Division Vancouver Work Order Reference VA22C4642



Telephone : +1 604 263 4188

Terrace Shipping # 2 Coolers Ground # Carbouys Air SFX



CERTIFICATE OF ANALYSIS

<p>Work Order : VA22C4785</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Groundwater</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 5</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby BC Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 13-Oct-2022 21:15</p> <p>Date Analysis Commenced : 14-Oct-2022</p> <p>Issue Date : 25-Oct-2022 10:56</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Benjamin Oke	Lab Assistant	Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.



Analytical Results

Sub-Matrix: Water					Client sample ID		BH-01	BH-02	BH-03	----	----
(Matrix: Water)					Client sampling date / time		12-Oct-2022 11:01	12-Oct-2022 11:50	12-Oct-2022 12:33	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4785-001	VA22C4785-002	VA22C4785-003	-----	-----	-----	-----
					Result	Result	Result	----	----	----	----
Physical Tests											
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	331	468	239	----	----	----	----
conductivity	----	E100	2.0	µS/cm	537	795	760	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	259	471	214	----	----	----	----
pH	----	E108	0.10	pH units	8.36	8.06	8.10	----	----	----	----
Anions and Nutrients											
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.142	0.183	<0.0050	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.250 ^{DLDS}	<0.250 ^{DLDS}	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<2.50 ^{DLDS}	<2.50 ^{DLDS}	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.054	<0.100 ^{DLDS}	<0.100 ^{DLDS}	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.308	0.197	0.076	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0165	<0.0250 ^{DLDS}	0.183	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0010	<0.0050 ^{DLDS}	<0.0050 ^{DLDS}	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	10.5	57.7	179	----	----	----	----
Organic / Inorganic Carbon											
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.29	1.02	1.05	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	16.0	6.93	2.66	----	----	----	----
Dissolved Metals											
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0130	0.0031	0.0010	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0.00028	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00606	0.00148	0.00036	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.313	0.0550	0.0265	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.098	0.078	0.057	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000124	0.0000119	0.0000917	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	38.7	81.3	63.1	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	0.000010	<0.000010	----	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00010	0.00051	<0.00010	----	----	----	----



Analytical Results

Sub-Matrix: Water					Client sample ID	BH-01	BH-02	BH-03	----	----
(Matrix: Water)					Client sampling date / time	12-Oct-2022 11:01	12-Oct-2022 11:50	12-Oct-2022 12:33	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4785-001	VA22C4785-002	VA22C4785-003	-----	-----	
					Result	Result	Result	----	----	
Dissolved Metals										
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00079	<0.00020	0.00057	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.163	0.153	<0.010	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0012	0.0039	0.0018	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	39.4	65.0	13.6	----	----	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.160	0.149	0.00063	----	----	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00292	0.00230	0.00553	----	----	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.13	2.64	2.02	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00039	0.00054	0.00042	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0.000322	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.52	7.80	3.59	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	29.5	24.1	90.3	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.18	1.92	0.894	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	3.73	21.3	61.6	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0.000011	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00023	<0.00010	<0.00010	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0.00013	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000488	0.000944	0.00205	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0021	0.0011	0.0028	----	----	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	----	----	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	BH-01	BH-02	BH-03	----	----
(Matrix: Water)					Client sampling date / time	12-Oct-2022 11:01	12-Oct-2022 11:50	12-Oct-2022 12:33	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4785-001	VA22C4785-002	VA22C4785-003	-----	-----	
					Result	Result	Result	----	----	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	66	71	<10	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
toluene	108-88-3	E611A	0.50	µg/L	3.04	3.60	<0.50	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	----	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	----	----	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	----	----	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	----	----	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	----	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	98.0	91.4	97.9	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	104	98.5	103	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	87.6	85.4	82.2	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	99.9	100	100	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C4785</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Groundwater</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 15</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 13-Oct-2022 21:15</p> <p>Issue Date : 25-Oct-2022 10:57</p>
---	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	VA22C4785-002	BH-02	silver, dissolved	7440-22-4	E421	63.1 % ^{MES}	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BH-01	E559-L	12-Oct-2022	----	----	----		21-Oct-2022	28 days	9 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BH-02	E559-L	12-Oct-2022	----	----	----		21-Oct-2022	28 days	9 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BH-03	E559-L	12-Oct-2022	----	----	----		21-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH-01	E298	12-Oct-2022	17-Oct-2022	----	----		19-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH-02	E298	12-Oct-2022	17-Oct-2022	----	----		19-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH-03	E298	12-Oct-2022	17-Oct-2022	----	----		19-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE BH-01	E235.Br-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE BH-02	E235.Br-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE BH-03	E235.Br-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE BH-01	E235.Cl	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE BH-02	E235.Cl	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE BH-03	E235.Cl	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE BH-01	E235.F	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE BH-02	E235.F	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE BH-03	E235.F	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE BH-01	E235.NO3-L	12-Oct-2022	14-Oct-2022	3 days	2 days	✔	14-Oct-2022	3 days	0 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE BH-02	E235.NO3-L	12-Oct-2022	14-Oct-2022	3 days	2 days	✔	14-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE BH-03	E235.NO3-L	12-Oct-2022	14-Oct-2022	3 days	2 days	✔	14-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE BH-01	E235.NO2-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE BH-02	E235.NO2-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE BH-03	E235.NO2-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE BH-01	E235.SO4	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE BH-02	E235.SO4	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE BH-03	E235.SO4	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) BH-01	E318	12-Oct-2022	16-Oct-2022	----	----		18-Oct-2022	28 days	6 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) BH-02	E318	12-Oct-2022	16-Oct-2022	----	----		18-Oct-2022	28 days	6 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) BH-03	E318	12-Oct-2022	16-Oct-2022	----	----		18-Oct-2022	28 days	6 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) BH-01	E509	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) BH-02	E509	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) BH-03	E509	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) BH-01	E421	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) BH-02	E421	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) BH-03	E421	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) BH-01	E601A	12-Oct-2022	24-Oct-2022	14 days	12 days	✔	25-Oct-2022	40 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) BH-02	E601A	12-Oct-2022	24-Oct-2022	14 days	12 days	✔	25-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) BH-03	E601A	12-Oct-2022	24-Oct-2022	14 days	12 days	✔	25-Oct-2022	40 days	1 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) BH-01	E581.VH+F1	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) BH-02	E581.VH+F1	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) BH-03	E581.VH+F1	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) BH-01	E358-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) BH-02	E358-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) BH-03	E358-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) BH-01	E355-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) BH-02	E355-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) BH-03	E355-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE BH-01	E290	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	14 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE BH-02	E290	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	14 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE BH-03	E290	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	14 days	4 days	✓	
Physical Tests : Conductivity in Water											
HDPE BH-01	E100	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✓	
Physical Tests : Conductivity in Water											
HDPE BH-02	E100	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✓	
Physical Tests : Conductivity in Water											
HDPE BH-03	E100	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✓	
Physical Tests : pH by Meter											
HDPE BH-01	E108	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	0.25 hrs	54.25 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE BH-02	E108	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	0.25 hrs	54.25 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE BH-03	E108	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	0.25 hrs	54.25 hrs	*	EHTR-FM
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) BH-01	E611A	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) BH-02	E611A	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) BH-03	E611A	12-Oct-2022	23-Oct-2022	----	----		24-Oct-2022	14 days	12 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	695581	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695588	1	3	33.3	5.0	✓
BTEX by Headspace GC-MS	E611A	710211	1	11	9.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695586	1	6	16.6	5.0	✓
Conductivity in Water	E100	695579	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698778	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695585	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695583	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695584	1	14	7.1	5.0	✓
pH by Meter	E108	695580	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	695582	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	710210	1	6	16.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	695581	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	711172	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695588	1	3	33.3	5.0	✓
BTEX by Headspace GC-MS	E611A	710211	1	11	9.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695586	1	6	16.6	5.0	✓
Conductivity in Water	E100	695579	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698778	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695585	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695583	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695584	1	14	7.1	5.0	✓
pH by Meter	E108	695580	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	695582	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	710210	1	6	16.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	695581	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	711172	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695588	1	3	33.3	5.0	✓
BTEX by Headspace GC-MS	E611A	710211	1	11	9.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695586	1	6	16.6	5.0	✓
Conductivity in Water	E100	695579	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698778	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695585	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695583	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695584	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	695582	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	710210	1	6	16.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695588	1	3	33.3	5.0	✓
BTEX by Headspace GC-MS	E611A	710211	1	11	9.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695586	1	6	16.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698778	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695585	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695583	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695584	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	695582	1	6	16.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	710210	1	6	16.6	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22C4785	Page	: 1 of 14
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Groundwater	Date Samples Received	: 13-Oct-2022 21:15
PO	: ----	Date Analysis Commenced	: 14-Oct-2022
C-O-C number	: ----	Issue Date	: 25-Oct-2022 10:56
Sampler	: H. Shinton ----		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Benjamin Oke	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

Page : 2 of 14
Work Order : VA22C4785
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Groundwater



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 695579)											
VA22C4715-002	Anonymous	conductivity	----	E100	2.0	µS/cm	168	167	0.478%	10%	----
Physical Tests (QC Lot: 695580)											
VA22C4715-002	Anonymous	pH	----	E108	0.10	pH units	8.01	8.00	0.125%	4%	----
Physical Tests (QC Lot: 695581)											
VA22C4715-002	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	78.6	79.0	0.508%	20%	----
Anions and Nutrients (QC Lot: 695582)											
VA22C4785-001	BH-01	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	10.5	10.5	0.233%	20%	----
Anions and Nutrients (QC Lot: 695583)											
VA22C4785-001	BH-01	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0165	0.0159	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695584)											
VA22C4785-001	BH-01	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0010	<0.0010	0.00002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695585)											
VA22C4785-001	BH-01	fluoride	16984-48-8	E235.F	0.020	mg/L	0.054	0.052	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695586)											
VA22C4785-001	BH-01	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695588)											
VA22C4785-001	BH-01	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 698700)											
VA22C4785-001	BH-01	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.308	0.255	0.053	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 699759)											
VA22C4785-001	BH-01	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.142	0.143	0.619%	20%	----
Organic / Inorganic Carbon (QC Lot: 699756)											
VA22C4785-001	BH-01	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.29	1.38	0.09	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 699757)											
VA22C4785-001	BH-01	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	16.0	17.1	6.71%	20%	----
Dissolved Metals (QC Lot: 698778)											
VA22C4785-001	BH-01	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0130	0.0132	1.15%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00606	0.00629	3.79%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.313	0.318	1.50%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 698778) - continued											
VA22C4785-001	BH-01	beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.098	0.097	0.0008	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000124	0.0000128	0.0000004	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	38.7	39.8	2.91%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00010	0.00011	0.000009	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00079	0.00083	0.00003	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.163	0.171	5.05%	20%	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0012	0.0013	0.00002	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	39.4	41.0	4.09%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.160	0.167	4.67%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00292	0.00289	0.783%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.13	2.28	6.78%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00039	0.00042	0.00003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.52	3.57	1.64%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	29.5	30.5	3.20%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.18	1.21	2.26%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	3.73	3.33	0.40	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	0.00023	0.00024	0.000008	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000488	0.000504	3.22%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0021	0.0021	0.000005	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 698778) - continued											
VA22C4785-001	BH-01	zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 699298)											
FJ2202909-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 708194)											
VA22C4785-001	BH-01	chemical oxygen demand [COD]	----	E559-L	10	mg/L	66	68	2	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 710211)											
FJ2202965-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 710210)											
FJ2202965-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 695579)						
conductivity	---	E100	1	µS/cm	1.0	---
Physical Tests (QCLot: 695581)						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	1.3	---
Anions and Nutrients (QCLot: 695582)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 695583)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 695584)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 695585)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 695586)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 695588)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 698700)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 699759)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Organic / Inorganic Carbon (QCLot: 699756)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 699757)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Dissolved Metals (QCLot: 698778)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 698778) - continued						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 699298)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 708194)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Volatile Organic Compounds (QCLot: 710211)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 710210)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 711172)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 695579)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.6	90.0	110	----
Physical Tests (QCLot: 695580)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 695581)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	114	85.0	115	----
Anions and Nutrients (QCLot: 695582)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 695583)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 695584)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 695585)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 695586)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 695588)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	99.6	85.0	115	----
Anions and Nutrients (QCLot: 698700)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.6	75.0	125	----
Anions and Nutrients (QCLot: 699759)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.3	85.0	115	----
Organic / Inorganic Carbon (QCLot: 699756)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	109	80.0	120	----
Organic / Inorganic Carbon (QCLot: 699757)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.2	80.0	120	----
Dissolved Metals (QCLot: 698778)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 698778) - continued									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	98.1	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	90.7	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.2	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	110	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	96.9	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	100	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	107	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.3	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	94.5	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	98.6	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	91.7	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	99.2	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	100	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.5	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 699298) - continued									
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	108	80.0	120	----
Aggregate Organics (QCLot: 708194)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	103	85.0	115	----
Volatile Organic Compounds (QCLot: 710211)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	99.4	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	98.8	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	104	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	107	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	107	70.0	130	----
Hydrocarbons (QCLot: 710210)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	77.8	70.0	130	----
Hydrocarbons (QCLot: 711172)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	107	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	115	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	110	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 695582)										
VA22C4785-002	BH-02	sulfate (as SO4)	14808-79-8	E235.SO4	495 mg/L	500 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 695583)										
VA22C4785-002	BH-02	nitrate (as N)	14797-55-8	E235.NO3-L	12.6 mg/L	12.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 695584)										
VA22C4785-002	BH-02	nitrite (as N)	14797-65-0	E235.NO2-L	2.34 mg/L	2.5 mg/L	93.5	75.0	125	----
Anions and Nutrients (QCLot: 695585)										
VA22C4785-002	BH-02	fluoride	16984-48-8	E235.F	4.94 mg/L	5 mg/L	98.8	75.0	125	----
Anions and Nutrients (QCLot: 695586)										
VA22C4785-002	BH-02	chloride	16887-00-6	E235.Cl	500 mg/L	500 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 695588)										
VA22C4785-002	BH-02	bromide	24959-67-9	E235.Br-L	2.41 mg/L	2.5 mg/L	96.4	75.0	125	----
Anions and Nutrients (QCLot: 698700)										
VA22C4785-002	BH-02	Kjeldahl nitrogen, total [TKN]	----	E318	2.36 mg/L	2.5 mg/L	94.6	70.0	130	----
Anions and Nutrients (QCLot: 699759)										
VA22C4785-002	BH-02	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 699756)										
VA22C4785-002	BH-02	carbon, dissolved organic [DOC]	----	E358-L	4.99 mg/L	5 mg/L	99.8	70.0	130	----
Organic / Inorganic Carbon (QCLot: 699757)										
VA22C4785-002	BH-02	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 698778)										
VA22C4785-002	BH-02	aluminum, dissolved	7429-90-5	E421	0.193 mg/L	0.2 mg/L	96.6	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00813 mg/L	0.01 mg/L	81.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.095 mg/L	0.1 mg/L	94.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00394 mg/L	0.004 mg/L	98.6	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 698778) - continued										
VA22C4785-002	BH-02	calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0101 mg/L	0.01 mg/L	101	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0369 mg/L	0.04 mg/L	92.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0178 mg/L	0.02 mg/L	89.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.95 mg/L	2 mg/L	97.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0179 mg/L	0.02 mg/L	89.4	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0928 mg/L	0.1 mg/L	92.8	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0362 mg/L	0.04 mg/L	90.6	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.2 mg/L	10 mg/L	102	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.90 mg/L	4 mg/L	97.4	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, dissolved	7440-21-3	E421	8.71 mg/L	10 mg/L	87.1	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00252 mg/L	0.004 mg/L	63.1	70.0	130	MES
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00360 mg/L	0.004 mg/L	90.1	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0390 mg/L	0.04 mg/L	97.5	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00375 mg/L	0.004 mg/L	93.8	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0989 mg/L	0.1 mg/L	98.9	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.366 mg/L	0.4 mg/L	91.4	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 699298)										
VA22C4727-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.000110 mg/L	0.0001 mg/L	110	70.0	130	----
Aggregate Organics (QCLot: 708194)										
VA22C4785-002	BH-02	chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 710211)										
FJ2202965-002	Anonymous	benzene	71-43-2	E611A	103 µg/L	100 µg/L	103	60.0	140	----
		ethylbenzene	100-41-4	E611A	106 µg/L	100 µg/L	106	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		styrene	100-42-5	E611A	97.6 µg/L	100 µg/L	97.6	60.0	140	----
		toluene	108-88-3	E611A	103 µg/L	100 µg/L	103	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	214 µg/L	200 µg/L	107	60.0	140	----
		xylene, o-	95-47-6	E611A	107 µg/L	100 µg/L	107	60.0	140	----
Hydrocarbons (QCLot: 710210)										
VA22C4785-001	BH-01	VHw (C6-C10)	----	E581.VH+F1	4200 µg/L	6310 µg/L	66.6	60.0	140	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																		
Company:	Regional District of Kitimat-Stikine	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																		
Contact:	Hannah Shinton	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>				EMERGENCY	1 Business day [E1 - 100%] <input type="checkbox"/>												
Phone:	250-641-4141	<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>					Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>												
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>				[Laboratory opening fees may apply]														
Street:	4545 Lazelle Avenue	Email 1 or Fax hshinton@rdks.bc.ca			Date and Time Required for all E&P TATs:																		
City/Province:	Terrace/BC	Email 2 eblaney@rdks.bc.ca;			For tests that can not be performed according to the service level selected, you will be contacted.																		
Postal Code:	V8G4E1	Email 3 nlavoie@rdks.bc.ca			Analysis Request																		
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																		
Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			F/P	F/P	F/P	F/P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax anne-maries@rdks.bc.ca			Dissolved Metals	Dissolved Mercury	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, Sulphate, Hardness	Ammonia	Nitrate	Nitrite	TOC	COD	pH	Conductivity	Total Kjeldahl Nitrogen	LEPH	BTEX/PH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	
Company: Regional District of Kitimat-Stikine		Email 2 nlavoie@rdks.bc.ca																					
Contact: Nicole Lavoie		Project Information			Oil and Gas Required Fields (client use)																		
ALS Account # / Quote #:		AFE/Cost Center:			PO#																		
Job #: Hazelton WMF Groundwater		Major/Minor Code:			Routing Code:																		
PO / AFE:		Requisitioner:																					
LSD:		Location:																					
ALS Lab Work Order # (lab use only): 4785		ALS Contact:			Sampler:			H. Shinton															
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mm-yy)	Time (hh:mm)	Sample Type																	
BH-01				12-Oct-22	11:05	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
BH-02				12-Oct-22	11:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
BH-03				12-Oct-22	12:33	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	

Terrace Shipping
 # 1 Coolers Ground
 # Carbouys Air
 SFX

Environmental Division
 Vancouver
 Work Order Reference
VA22C4785

Telephone: +1 604 253 4188

Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS												
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)			Frozen <input type="checkbox"/> SIF Observations												
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		BH-03 Sample does not fill all bottles due to volume limitations of passive sample collection method.			Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact <input type="checkbox"/>												
					Cooling Initiated <input type="checkbox"/>												
					INITIAL COOLER TEMPERATURES °C						FINAL COOLER TEMPERATURES °C						
					8°						4.5°						
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)									
Released by: Hannah Shinton		Date: Oct. 12, 2022		Time:		Received by: Colton Cogan		Date: Oct 13/22		Time: 10:30		Received by: RJ		Date: Oct-13		Time: 2:15	

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



CERTIFICATE OF ANALYSIS

<p>Work Order : VA22C4786</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton Surface Water</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 7</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby BC Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 13-Oct-2022 21:15</p> <p>Date Analysis Commenced : 14-Oct-2022</p> <p>Issue Date : 26-Oct-2022 13:17</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Ann Joby	Lab Assistant	Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-01	SW-02	----	----	----
(Matrix: Water)					Client sampling date / time	12-Oct-2022 13:22	12-Oct-2022 14:10	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4786-001	VA22C4786-002	-----	-----	-----	
					Result	Result	----	----	----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	18.5	114	----	----	----	
conductivity	----	E100	2.0	µS/cm	42.3	214	----	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	21.6	105	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	21.3	132	----	----	----	
pH	----	E108	0.10	pH units	7.27	8.06	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0341	4.30	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	0.97	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.025	0.071	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.01	14.4	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	0.0092	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	----	----	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	17.9	30.7	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	19.6	60.1	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.299	2.82	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	0.00028	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00198	0.00595	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0188	0.159	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	0.000112	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	0.012	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000307	0.000314	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	5.85	38.2	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	0.000150	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00065	0.00297	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-01	SW-02	---	---	---
(Matrix: Water)					Client sampling date / time	12-Oct-2022 13:22	12-Oct-2022 14:10	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA22C4786-001	VA22C4786-002	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00258	0.00326	---	---	---	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00104	0.0115	---	---	---	
iron, total	7439-89-6	E420	0.010	mg/L	4.71	18.5	---	---	---	
lead, total	7439-92-1	E420	0.000050	mg/L	0.000149	0.00123	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	0.0016	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	1.63	8.87	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.416	0.297	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000054	<0.0000050	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000133	0.000720	---	---	---	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00134	0.00702	---	---	---	
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.295	4.69	---	---	---	
potassium, total	7440-09-7	E420	0.050	mg/L	1.50	8.03	---	---	---	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00118	0.00253	---	---	---	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000056	0.000213	---	---	---	
silicon, total	7440-21-3	E420	0.10	mg/L	3.79	10.6	---	---	---	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	0.000050	---	---	---	
sodium, total	7440-23-5	E420	0.050	mg/L	0.865	3.99	---	---	---	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0444	0.232	---	---	---	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	1.15	---	---	---	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	0.000012	---	---	---	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00550	0.0458	---	---	---	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000011	0.000131	---	---	---	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00138	0.00727	---	---	---	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0071	0.0574	---	---	---	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00024	0.00025	---	---	---	

Dissolved Metals



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-01	SW-02	---	---	---
(Matrix: Water)					Client sampling date / time	12-Oct-2022 13:22	12-Oct-2022 14:10	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA22C4786-001	VA22C4786-002	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.233	0.0576	---	---	---	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00174	0.00268	---	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0170	0.0340	---	---	---	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	---	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000291	0.0000164	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	5.93	29.1	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00256	0.00146	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00065	0.00074	---	---	---	
iron, dissolved	7439-89-6	E421	0.010	mg/L	3.81	5.40	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000102	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.66	7.96	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.406	0.212	---	---	---	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000110	0.000079	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00125	0.00140	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.194	1.30	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.55	7.49	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00126	0.00164	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000086	0.000094	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.48	7.35	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.884	3.86	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0472	0.178	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-01	SW-02	----	----	----
(Matrix: Water)					Client sampling date / time	12-Oct-2022 13:22	12-Oct-2022 14:10	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA22C4786-001	VA22C4786-002	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00377	0.00172	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	0.000013	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00102	<0.00050	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0072	0.0081	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00034	<0.00020	---	---	---	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	---	---	---	
dissolved metals filtration location	----	EP421	-	-	Field	Field	---	---	---	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	61	464	---	---	---	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
toluene	108-88-3	E611A	0.50	µg/L	1.57	3.69	---	---	---	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	---	---	---	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	---	---	---	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	---	---	---	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	---	---	---	
EPH (C10-C32)	----	E601A	400	µg/L	<400	460	---	---	---	
EPH (C19-C32)	----	E601A	250	µg/L	<250	460	---	---	---	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	480	---	---	---	
VPHw	----	EC580A	100	µg/L	<100	<100	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-01	SW-02	----	----	----
(Matrix: Water)					Client sampling date / time	12-Oct-2022 13:22	12-Oct-2022 14:10	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4786-001	VA22C4786-002	-----	-----	-----	
					Result	Result	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	92.4	96.4	----	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	80.9	83.6	----	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	78.2	81.7	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	98.6	99.3	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C4786</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton Surface Water</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 14</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 13-Oct-2022 21:15</p> <p>Issue Date : 26-Oct-2022 13:17</p>
---	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-01	E559-L	12-Oct-2022	----	----	----		21-Oct-2022	28 days	9 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-02	E559-L	12-Oct-2022	----	----	----		21-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW-01	E298	12-Oct-2022	17-Oct-2022	----	----		19-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW-02	E298	12-Oct-2022	17-Oct-2022	----	----		19-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE SW-01	E235.Br-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE SW-02	E235.Br-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-01	E235.Cl	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-02	E235.Cl	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-01	E235.F	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-02	E235.F	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-01	E235.NO3-L	12-Oct-2022	14-Oct-2022	3 days	2 days	✔	14-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-02	E235.NO3-L	12-Oct-2022	14-Oct-2022	3 days	2 days	✔	14-Oct-2022	3 days	0 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-01	E235.NO2-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-02	E235.NO2-L	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	3 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-01	E235.SO4	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-02	E235.SO4	12-Oct-2022	14-Oct-2022	----	----		14-Oct-2022	28 days	2 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-01	E318	12-Oct-2022	16-Oct-2022	----	----		18-Oct-2022	28 days	6 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-02	E318	12-Oct-2022	16-Oct-2022	----	----		18-Oct-2022	28 days	6 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-01	E509	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-02	E509	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-01	E421	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-02	E421	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-01	E601A	12-Oct-2022	24-Oct-2022	14 days	12 days	✔	25-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-02	E601A	12-Oct-2022	24-Oct-2022	14 days	12 days	✔	25-Oct-2022	40 days	1 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-01	E581.VH+F1	12-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	14 days	12 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-02	E581.VH+F1	12-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	14 days	12 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-01	E358-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-02	E358-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-01	E355-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-02	E355-L	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	28 days	5 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-01	E290	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	14 days	4 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-02	E290	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	14 days	4 days	✔	
Physical Tests : Conductivity in Water											
HDPE SW-01	E100	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✔	
Physical Tests : Conductivity in Water											
HDPE SW-02	E100	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE SW-01	E108	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	0.25 hrs	57.25 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-02	E108	12-Oct-2022	14-Oct-2022	----	----		16-Oct-2022	0.25 hrs	57.25 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-01	E508	12-Oct-2022	16-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-02	E508	12-Oct-2022	16-Oct-2022	----	----		16-Oct-2022	28 days	4 days	✓	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-01	E420	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✓	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-02	E420	12-Oct-2022	17-Oct-2022	----	----		17-Oct-2022	180 days	5 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-01	E611A	12-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	14 days	12 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-02	E611A	12-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	14 days	12 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	695717	1	7	14.2	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695712	1	2	50.0	5.0	✓
BTEX by Headspace GC-MS	E611A	712365	1	3	33.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695709	1	2	50.0	5.0	✓
Conductivity in Water	E100	695716	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698219	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695711	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695713	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695714	1	7	14.2	5.0	✓
pH by Meter	E108	695715	1	2	50.0	5.0	✓
Sulfate in Water by IC	E235.SO4	695710	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Mercury in Water by CVAAS	E508	698628	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	698248	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	712364	1	2	50.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	695717	1	7	14.2	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	711172	1	17	5.8	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695712	1	2	50.0	5.0	✓
BTEX by Headspace GC-MS	E611A	712365	1	3	33.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695709	1	2	50.0	5.0	✓
Conductivity in Water	E100	695716	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698219	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695711	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695713	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695714	1	7	14.2	5.0	✓
pH by Meter	E108	695715	1	2	50.0	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	695710	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Mercury in Water by CVAAS	E508	698628	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	698248	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	712364	1	2	50.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	695717	1	7	14.2	5.0	✓
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	711172	1	17	5.8	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695712	1	2	50.0	5.0	✓
BTEX by Headspace GC-MS	E611A	712365	1	3	33.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695709	1	2	50.0	5.0	✓
Conductivity in Water	E100	695716	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698219	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695711	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695713	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695714	1	7	14.2	5.0	✓
Sulfate in Water by IC	E235.SO4	695710	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✓
Total Mercury in Water by CVAAS	E508	698628	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	698248	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	712364	1	2	50.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	699759	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	695712	1	2	50.0	5.0	✓
BTEX by Headspace GC-MS	E611A	712365	1	3	33.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	708194	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	695709	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	699298	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	698219	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	699756	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	695711	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	695713	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	695714	1	7	14.2	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	695710	1	18	5.5	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	698700	1	12	8.3	5.0	✔
Total Mercury in Water by CVAAS	E508	698628	1	20	5.0	5.0	✔
Total metals in Water by CRC ICPMS	E420	698248	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	699757	1	13	7.6	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	712364	1	2	50.0	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
	Vancouver - Environmental			
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

<p>Work Order : VA22C4786</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone :</p> <p>Project : Hazelton Surface Water</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton ----</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 18</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 13-Oct-2022 21:15</p> <p>Date Analysis Commenced : 14-Oct-2022</p> <p>Issue Date : 26-Oct-2022 13:17</p>
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Ann Joby	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

Page : 2 of 18
Work Order : VA22C4786
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 695715)											
VA22C4786-001	SW-01	pH	----	E108	0.10	pH units	7.27	7.21	0.829%	4%	----
Physical Tests (QC Lot: 695716)											
VA22C4786-001	SW-01	conductivity	----	E100	2.0	µS/cm	42.3	43.7	3.26%	10%	----
Physical Tests (QC Lot: 695717)											
VA22C4789-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	182	177	2.79%	20%	----
Anions and Nutrients (QC Lot: 695709)											
VA22C4786-001	SW-01	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695710)											
VA22C4786-001	SW-01	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695711)											
VA22C4786-001	SW-01	fluoride	16984-48-8	E235.F	0.020	mg/L	0.025	0.026	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695712)											
VA22C4786-001	SW-01	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695713)											
VA22C4786-001	SW-01	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 695714)											
VA22C4786-001	SW-01	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 698700)											
VA22C4785-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.308	0.255	0.053	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 699759)											
VA22C4785-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.142	0.143	0.619%	20%	----
Organic / Inorganic Carbon (QC Lot: 699756)											
VA22C4785-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.29	1.38	0.09	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 699757)											
VA22C4785-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	16.0	17.1	6.71%	20%	----
Total Metals (QC Lot: 698248)											
VA22C4786-001	SW-01	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.299	0.302	1.08%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00198	0.00201	1.70%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0188	0.0192	2.08%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 698248) - continued											
VA22C4786-001	SW-01	beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000307	0.0000335	0.0000028	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	5.85	5.92	1.17%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	0.00065	0.00066	0.000009	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00258	0.00263	1.90%	20%	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00104	0.00103	0.00001	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	4.71	4.74	0.551%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000149	0.000155	0.000006	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	1.63	1.64	0.554%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.416	0.434	4.29%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000133	0.000129	0.000004	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00134	0.00139	0.00005	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.295	0.286	0.008	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	1.50	1.53	1.84%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00118	0.00126	0.00008	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000056	0.000070	0.000014	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	3.79	3.80	0.473%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	0.865	0.878	1.55%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0444	0.0460	3.43%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00550	0.00537	2.31%	20%	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000011	0.000011	0.0000005	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00138	0.00141	0.00003	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0071	0.0072	0.00004	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 698248) - continued											
VA22C4786-001	SW-01	zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00024	0.00027	0.00003	Diff <2x LOR	----
Total Metals (QC Lot: 698628)											
VA22C4769-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 698219)											
VA22C4779-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0101	0.0106	5.47%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00048	0.00045	0.00003	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000062	<0.0000050	0.0000012	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	0.175	0.174	0.0008	Diff <2x LOR	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.0644	0.0635	1.47%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00836	0.00849	1.64%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.298	0.288	0.010	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00046	0.00051	0.00004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.134	0.128	0.006	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00157	0.00155	0.00002	Diff <2x LOR	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 698219) - continued											
VA22C4779-001	Anonymous	thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.000030	mg/L	<0.000030	<0.000030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0010	0.0011	0.00004	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.000030	mg/L	<0.000030	<0.000030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 699298)											
FJ2202909-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 708194)											
VA22C4785-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	66	68	2	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 712365)											
VA22C4786-001	SW-01	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	1.57	1.56	0.01	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 712364)											
VA22C4786-001	SW-01	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 695716)						
conductivity	---	E100	1	µS/cm	1.5	---
Physical Tests (QCLot: 695717)						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
Anions and Nutrients (QCLot: 695709)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 695710)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 695711)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 695712)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 695713)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 695714)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 698700)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 699759)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Organic / Inorganic Carbon (QCLot: 699756)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 699757)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 698248)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 698248) - continued						
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 698628)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 698219)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 698219) - continued						
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 698219) - continued						
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 699298)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 708194)						
chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 712365)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-6	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 711172)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	----
EPH (C19-C32)	---	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 712364)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 695715)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 695716)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.0	90.0	110	----
Physical Tests (QCLot: 695717)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 695709)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 695710)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 695711)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 695712)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	99.0	85.0	115	----
Anions and Nutrients (QCLot: 695713)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 695714)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100.0	90.0	110	----
Anions and Nutrients (QCLot: 698700)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.6	75.0	125	----
Anions and Nutrients (QCLot: 699759)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.3	85.0	115	----
Organic / Inorganic Carbon (QCLot: 699756)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	109	80.0	120	----
Organic / Inorganic Carbon (QCLot: 699757)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.2	80.0	120	----
Total Metals (QCLot: 698248)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	102	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	99.3	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----



Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 698248) - continued									
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.7	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	86.9	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	96.4	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	95.4	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	95.8	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	98.5	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.1	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	89.2	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	95.5	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	96.9	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	98.6	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	98.6	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.6	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	98.9	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	97.7	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.1	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	89.4	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	94.6	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	97.8	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	95.9	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	91.9	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	96.6	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	98.1	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	97.7	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	97.7	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.7	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	93.6	80.0	120	----



Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 698628)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	106	80.0	120	----
Dissolved Metals (QCLot: 698219)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	100.0	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.5	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.1	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	110	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	89.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.6	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	97.1	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.0	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.9	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	87.5	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.3	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	98.4	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.5	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	96.4	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	99.4	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.4	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	110	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.9	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	96.7	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.6	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	96.3	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	98.6	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 698219) - continued									
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	97.4	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	99.0	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	96.6	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	108	80.0	120	----
Aggregate Organics (QCLot: 708194)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	103	85.0	115	----
Volatile Organic Compounds (QCLot: 712365)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	116	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	117	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	116	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	119	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	118	70.0	130	----
Hydrocarbons (QCLot: 711172)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	107	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	115	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	110	70.0	130	----
Hydrocarbons (QCLot: 712364)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	79.4	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 695709)										
VA22C4786-002	SW-02	chloride	16887-00-6	E235.Cl	99.6 mg/L	100 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 695710)										
VA22C4786-002	SW-02	sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 695711)										
VA22C4786-002	SW-02	fluoride	16984-48-8	E235.F	0.984 mg/L	1 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 695712)										
VA22C4786-002	SW-02	bromide	24959-67-9	E235.Br-L	0.498 mg/L	0.5 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 695713)										
VA22C4786-002	SW-02	nitrate (as N)	14797-55-8	E235.NO3-L	2.50 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 695714)										
VA22C4786-002	SW-02	nitrite (as N)	14797-65-0	E235.NO2-L	0.494 mg/L	0.5 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 698700)										
VA22C4785-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.36 mg/L	2.5 mg/L	94.6	70.0	130	----
Anions and Nutrients (QCLot: 699759)										
VA22C4785-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 699756)										
VA22C4785-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	4.99 mg/L	5 mg/L	99.8	70.0	130	----
Organic / Inorganic Carbon (QCLot: 699757)										
VA22C4785-002	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 698248)										
VA22C4786-002	SW-02	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00902 mg/L	0.01 mg/L	90.2	70.0	130	----
		boron, total	7440-42-8	E420	0.084 mg/L	0.1 mg/L	83.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00384 mg/L	0.004 mg/L	96.0	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 698248) - continued										
VA22C4786-002	SW-02	calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00949 mg/L	0.01 mg/L	94.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0188 mg/L	0.02 mg/L	93.8	70.0	130	----
		copper, total	7440-50-8	E420	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0182 mg/L	0.02 mg/L	91.0	70.0	130	----
		lithium, total	7439-93-2	E420	0.0954 mg/L	0.1 mg/L	95.4	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		nickel, total	7440-02-0	E420	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.89 mg/L	10 mg/L	98.9	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0186 mg/L	0.02 mg/L	93.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00398 mg/L	0.004 mg/L	99.6	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	19.8 mg/L	20 mg/L	99.0	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		thallium, total	7440-28-0	E420	0.00361 mg/L	0.004 mg/L	90.3	70.0	130	----
		thorium, total	7440-29-1	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		tin, total	7440-31-5	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		titanium, total	7440-32-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0189 mg/L	0.02 mg/L	94.6	70.0	130	----
		uranium, total	7440-61-1	E420	0.00378 mg/L	0.004 mg/L	94.6	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0970 mg/L	0.1 mg/L	97.0	70.0	130	----
		zinc, total	7440-66-6	E420	0.383 mg/L	0.4 mg/L	95.8	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
Total Metals (QCLot: 698628)										
VA22C4769-002	Anonymous	mercury, total	7439-97-6	E508	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 698219)										
VA22C4779-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.191 mg/L	0.2 mg/L	95.7	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 698219) - continued										
VA22C4779-002	Anonymous	antimony, dissolved	7440-36-0	E421	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00860 mg/L	0.01 mg/L	86.0	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.085 mg/L	0.1 mg/L	85.1	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		calcium, dissolved	7440-70-2	E421	3.78 mg/L	4 mg/L	94.6	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00970 mg/L	0.01 mg/L	97.0	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0368 mg/L	0.04 mg/L	91.9	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.89 mg/L	2 mg/L	94.5	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	0.975 mg/L	1 mg/L	97.5	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.84 mg/L	10 mg/L	98.4	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.91 mg/L	4 mg/L	97.7	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0396 mg/L	0.04 mg/L	98.9	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.00 mg/L	10 mg/L	90.0	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00416 mg/L	0.004 mg/L	104	70.0	130	----
		sodium, dissolved	7440-23-5	E421	2.09 mg/L	2 mg/L	104	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	19.6 mg/L	20 mg/L	97.9	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00392 mg/L	0.004 mg/L	98.1	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0224 mg/L	0.02 mg/L	112	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00386 mg/L	0.004 mg/L	96.5	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 698219) - continued										
VA22C4779-002	Anonymous	vanadium, dissolved	7440-62-2	E421	0.0969 mg/L	0.1 mg/L	96.9	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.407 mg/L	0.4 mg/L	102	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 699298)										
VA22C4727-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.000110 mg/L	0.0001 mg/L	110	70.0	130	----
Aggregate Organics (QCLot: 708194)										
VA22C4785-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----
Volatile Organic Compounds (QCLot: 712365)										
VA22C4786-001	SW-01	benzene	71-43-2	E611A	95.0 µg/L	100 µg/L	95.0	60.0	140	----
		ethylbenzene	100-41-4	E611A	92.7 µg/L	100 µg/L	92.7	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	92.0 µg/L	100 µg/L	92.0	60.0	140	----
		styrene	100-42-5	E611A	85.4 µg/L	100 µg/L	85.4	60.0	140	----
		toluene	108-88-3	E611A	93.2 µg/L	100 µg/L	93.2	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	186 µg/L	200 µg/L	93.2	60.0	140	----
		xylene, o-	95-47-6	E611A	95.4 µg/L	100 µg/L	95.4	60.0	140	----
Hydrocarbons (QCLot: 712364)										
VA22C4786-002	SW-02	VHw (C6-C10)	----	E581.VH+F1	4220 µg/L	6310 µg/L	66.8	60.0	140	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.



Chain of Custody (COC) / Analytical Request Form


Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report			Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																									
Company: Regional District of Kitimat-Stikine			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																									
Contact: Hannah Shinton			Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Day)		EMERGENCY																							
Phone: 250-615-6100			<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E1 - 100%] <input type="checkbox"/>																							
Company address below will appear on the final report			Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																							
Street: 4545 Lazelle Avenue			Email 1 or Fax hshinton@rdks.bc.ca			2 day [P2-50%] <input type="checkbox"/>																									
City/Province: Terrace/BC			Email 2 enviro.dept@rdks.bc.ca			Date and Time Required for all E&P TATs:																									
Postal Code: V8G4E1			Email 3			For tests that can not be performed according to the service level selected, you will be contacted.																									
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			Invoice Distribution			Analysis Request																									
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																									
Company: Regional District of Kitimat-Stikine			Email 1 or Fax anne-maries@rdks.bc.ca, hshinton@rdks.bc.ca			P	F/P	F/P	P		P	P	P	P	P	P															
Contact: Hannah Shinton			Email 2 enviro.dept@rdks.bc.ca																												
Project Information			Oil and Gas Required Fields (client use)																												
ALS Account # / Quote #:			AFE/Cost Center: PO#																												
Job #: Hazelton Surface Water			Major/Minor Code: Routing Code:																												
PO / AFE:			Requisitioner:																												
LSD:			Location:																												
ALS Lab Work Order # (lab use only): 4786			ALS Contact:			Sampler: H. Shinton																									
ALS Sample # (lab use only)			Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mm-yy)		Time (hh:mm)		Sample Type		Total Metals	Dissolved Metals	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, sulphate, hardness	Ammonia	Nitrate	Nitrite	Total Kjeldahl Nitrogen	TOC	pH	COD	Conductivity	EPH	BTEX / VPH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS		
SW-01			Environmental Division Vancouver Work Order Reference VA22C4786  Telephone : + 1 604 263 4188			12-Oct-22		13:22		Water		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				
SW-02						12-Oct-22		14:10		Water		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
Drinking Water (DW) Samples ¹ (client use)			Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																									
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)			Frozen <input type="checkbox"/>			SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>			Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/>			Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>			Cooling Initiated <input type="checkbox"/>													
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C																						
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			8.8°			4.5																						
Released by: Hannah Shinton			Date: Oct. 13, 2022			Time: Colton Gagnon			Date: Oct 13/22			Time: 1030			Received by: RJ			Date: OCT-13			Time: 2115										

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FROM

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

<p>Work Order : VA22C5460</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Groundwater</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 5</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby BC Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 20-Oct-2022 11:00</p> <p>Date Analysis Commenced : 22-Oct-2022</p> <p>Issue Date : 01-Nov-2022 12:46</p>
--	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Maqsood UHassan	Laboratory Analyst	Organics, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia
Victoria Piguing	Laboratory Analyst	Organics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Water					Client sample ID	BH-4A	BH-5B	Field Blank	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 09:50	18-Oct-2022 16:20	18-Oct-2022 14:05	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5460-001	VA22C5460-002	VA22C5460-003	-----	-----	
					Result	Result	Result	----	----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	266	548	<1.0	----	----	
conductivity	----	E100	2.0	µS/cm	747	1820	<2.0	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	204	828	<0.60	----	----	
pH	----	E108	0.10	pH units	8.43	7.53	5.35	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.272	<0.0050	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250	3.15	<0.050	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	<2.50 ^{DLDS}	297	<0.50	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.200 ^{DLDS}	<0.020	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.105	0.547	<0.050	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.389	<0.0500 ^{DLDS}	<0.0050	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 ^{DLDS}	<0.0100 ^{DLDS}	<0.0010	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	136	<3.00 ^{DLDS}	<0.30	----	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.41	5.13	0.67	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.70	5.79	<0.50	----	----	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0129	0.0019	<0.0010	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00021	<0.00010	<0.00010	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00043	0.00928	<0.00010	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0664	0.281	<0.00010	----	----	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.050	0.014	<0.010	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000304	0.0000162	<0.0000050	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	54.8	224	<0.050	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	0.00488	<0.00010	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	BH-4A	BH-5B	Field Blank	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 09:50	18-Oct-2022 16:20	18-Oct-2022 14:05	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5460-001	VA22C5460-002	VA22C5460-003	-----	-----	
					Result	Result	Result	----	----	
Dissolved Metals										
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00201	0.00037	<0.00020	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	6.26	<0.010	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0015	0.0033	<0.0010	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.4	65.3	<0.0050	----	----	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00052	4.37	<0.00010	----	----	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00311	0.000580	<0.000050	----	----	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	0.00735	0.00168 ^{RRV}	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	0.106	<0.050	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.69	4.61	<0.050	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00029	0.00080	<0.00020	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00107	<0.000050	<0.000050	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.05	9.01	<0.050	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	92.8	71.6	<0.050	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.824	1.72	<0.00020	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	52.6	1.16	<0.50	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	0.000014	<0.000010	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00335	0.00250	<0.000010	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0018	0.0019	<0.0010	----	----	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	0.00020	<0.00020	----	----	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	----	----	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	BH-4A	BH-5B	Field Blank	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 09:50	18-Oct-2022 16:20	18-Oct-2022 14:05	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5460-001	VA22C5460-002	VA22C5460-003	-----	-----	
					Result	Result	Result	----	----	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	31	<10	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	----	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	----	----	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	----	----	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	----	----	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	----	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	108	110	104	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	91.4	90.6	104	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	83.4	80.5	84.0	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	94.2	93.2	92.6	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C5460</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton WMF Groundwater</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 15</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 20-Oct-2022 11:00</p> <p>Issue Date : 01-Nov-2022 12:47</p>
--	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Dissolved Metals	QC-MRG2-7106090 02	----	lithium, dissolved	7439-93-2	E421	122 % ^{MES}	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BH-4A	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) BH-5B	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Field Blank	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH-4A	E298	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BH-5B	E298	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Field Blank	E298	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE BH-4A	E235.Br-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE BH-5B	E235.Br-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Field Blank	E235.Br-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE BH-4A	E235.Cl	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE BH-5B	E235.Cl	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Field Blank	E235.Cl	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE BH-4A	E235.F	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE BH-5B	E235.F	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Field Blank	E235.F	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE BH-4A	E235.NO3-L	18-Oct-2022	22-Oct-2022	3 days	4 days	* EHT	23-Oct-2022	3 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE BH-5B	E235.NO3-L	18-Oct-2022	22-Oct-2022	3 days	4 days	* EHT	23-Oct-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Field Blank	E235.NO3-L	18-Oct-2022	22-Oct-2022	3 days	4 days	* EHT	23-Oct-2022	3 days	1 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE BH-4A	E235.NO2-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	3 days	5 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE BH-5B	E235.NO2-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	3 days	5 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Field Blank	E235.NO2-L	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	3 days	5 days	* EHT	
Anions and Nutrients : Sulfate in Water by IC											
HDPE BH-4A	E235.SO4	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE BH-5B	E235.SO4	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Field Blank	E235.SO4	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) BH-4A	E318	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) BH-5B	E318	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Field Blank	E318	18-Oct-2022	26-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) BH-4A	E509	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) BH-5B	E509	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) Field Blank	E509	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) BH-4A	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) BH-5B	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) Field Blank	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) BH-4A	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) BH-5B	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✓	29-Oct-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✓	29-Oct-2022	40 days	1 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) BH-4A	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) BH-5B	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) BH-4A	E358-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) BH-5B	E358-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Field Blank	E358-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) BH-4A	E355-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BH-5B	E355-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Field Blank	E355-L	18-Oct-2022	26-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BH-4A	E290	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BH-5B	E290	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Field Blank	E290	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	14 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE BH-4A	E100	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE BH-5B	E100	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE Field Blank	E100	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE BH-4A	E108	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	0.25 hrs	26.25 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE BH-5B	E108	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	0.25 hrs	26.25 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE Field Blank	E108	18-Oct-2022	22-Oct-2022	----	----		23-Oct-2022	0.25 hrs	26.25 hrs	*	EHTR-FM
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) BH-4A	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) BH-5B	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Field Blank	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	709703	1	4	25.0	5.0	✔
Ammonia by Fluorescence	E298	714828	1	13	7.6	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	709707	1	4	25.0	5.0	✔
BTEX by Headspace GC-MS	E611A	719460	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	709706	1	4	25.0	5.0	✔
Conductivity in Water	E100	709704	1	9	11.1	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	711297	1	19	5.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714829	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	709705	1	4	25.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	709708	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	709709	1	12	8.3	5.0	✔
pH by Meter	E108	709702	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	709710	1	4	25.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	714826	1	8	12.5	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714827	1	14	7.1	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	1	6	16.6	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	709703	1	4	25.0	5.0	✔
Ammonia by Fluorescence	E298	714828	1	13	7.6	5.0	✔
BC PHCs - EPH by GC-FID	E601A	718944	1	12	8.3	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	709707	1	4	25.0	5.0	✔
BTEX by Headspace GC-MS	E611A	719460	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	709706	1	4	25.0	5.0	✔
Conductivity in Water	E100	709704	1	9	11.1	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	711297	1	19	5.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714829	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	709705	1	4	25.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	709708	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	709709	1	12	8.3	5.0	✔
pH by Meter	E108	709702	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	709710	1	4	25.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	714826	1	8	12.5	5.0	✔



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714827	1	14	7.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	1	6	16.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	709703	1	4	25.0	5.0	✓
Ammonia by Fluorescence	E298	714828	1	13	7.6	5.0	✓
BC PHCs - EPH by GC-FID	E601A	718944	1	12	8.3	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	709707	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	719460	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	709706	1	4	25.0	5.0	✓
Conductivity in Water	E100	709704	1	9	11.1	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	711297	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714829	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	709705	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	709708	1	9	11.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	709709	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	709710	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	714826	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714827	1	14	7.1	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	1	6	16.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	714828	1	13	7.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	709707	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	719460	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	709706	1	4	25.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	711297	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714829	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	709705	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	709708	1	9	11.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	709709	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	709710	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	714826	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714827	1	14	7.1	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Calgary - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Calgary - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
VPH: VH-BTEX-Styrene	EC580A Calgary - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

<p>Work Order : VA22C5460</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone :</p> <p>Project : Hazelton WMF Groundwater</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H Shinton ----</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 3</p> <p>No. of samples analysed : 3</p>	<p>Page : 1 of 14</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 20-Oct-2022 11:00</p> <p>Date Analysis Commenced : 22-Oct-2022</p> <p>Issue Date : 01-Nov-2022 12:42</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Brianna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Maqsood UlHassan	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Victoria Piguing	Laboratory Analyst	Calgary Organics, Calgary, Alberta

Page : 2 of 14
Work Order : VA22C5460
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Groundwater



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 709702)											
FJ2202981-001	Anonymous	pH	----	E108	0.10	pH units	8.32	8.33	0.120%	4%	----
Physical Tests (QC Lot: 709703)											
FJ2202981-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	182	184	1.20%	20%	----
Physical Tests (QC Lot: 709704)											
FJ2202981-001	Anonymous	conductivity	----	E100	2.0	µS/cm	471	474	0.635%	10%	----
Anions and Nutrients (QC Lot: 709705)											
FJ2202981-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.098	0.092	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709706)											
FJ2202981-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	0.87	0.84	0.02	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709707)											
FJ2202981-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709708)											
FJ2202981-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.182	0.184	1.00%	20%	----
Anions and Nutrients (QC Lot: 709709)											
FJ2202981-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709710)											
FJ2202981-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	70.1	70.2	0.160%	20%	----
Anions and Nutrients (QC Lot: 714826)											
VA22C5460-001	BH-4A	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.105	0.110	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714828)											
VA22C5460-001	BH-4A	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 714827)											
VA22C5460-001	BH-4A	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.70	1.99	0.29	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 714829)											
VA22C5460-001	BH-4A	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.41	1.48	0.07	Diff <2x LOR	----
Dissolved Metals (QC Lot: 710610)											
KS2204038-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.00258	0.00259	0.000009	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 710610) - continued											
KS2204038-001	Anonymous	beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.305	0.309	0.004	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	459	464	1.09%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	0.000835	0.000843	0.000008	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.00280	0.00286	0.00006	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00308	0.00316	0.00008	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.279	0.288	3.35%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	1110	1110	0.307%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.230	0.229	0.228%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.000744	0.000695	0.000049	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	11.1	11.2	1.37%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.0114	0.0107	0.00068	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.0102	0.0111	7.61%	20%	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	22.1	22.4	1.64%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	387	390	0.704%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	11.2	11.5	2.83%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1980	1990	0.969%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.00759	0.00751	1.14%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 710610) - continued											
KS2204038-001	Anonymous	zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 711297)											
VA22C5428-004	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 723095)											
VA22C5421-028	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 719460)											
CG2214810-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 719461)											
VA22C5460-001	BH-4A	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 709703)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 709704)						
conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 709705)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 709706)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 709707)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 709708)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 709709)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 709710)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 714826)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 714828)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 714827)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 714829)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 710610)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 710610) - continued						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 711297)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 723095)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Volatile Organic Compounds (QCLot: 719460)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 718944)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 719461)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 709702)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 709703)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 709704)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.2	90.0	110	----
Anions and Nutrients (QCLot: 709705)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.3	90.0	110	----
Anions and Nutrients (QCLot: 709706)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 709707)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	97.0	85.0	115	----
Anions and Nutrients (QCLot: 709708)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 709709)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 709710)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 714826)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.6	75.0	125	----
Anions and Nutrients (QCLot: 714828)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.8	85.0	115	----
Organic / Inorganic Carbon (QCLot: 714827)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Organic / Inorganic Carbon (QCLot: 714829)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 710610)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	108	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	110	80.0	120	----



Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 710610) - continued									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	109	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.8	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	94.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	113	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	# 122	80.0	120	MES
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	109	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	118	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	112	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	99.6	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	96.1	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	100	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	107	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 711297) - continued									
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
Aggregate Organics (QCLot: 723095)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	108	85.0	115	----
Volatile Organic Compounds (QCLot: 719460)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	85.7	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	79.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	91.3	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	81.6	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	79.4	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	84.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	86.3	70.0	130	----
Hydrocarbons (QCLot: 718944)									
EPH (C10-C19)	----	E601A	250	µg/L	6638.596 µg/L	119	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3614.035 µg/L	119	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	10238.59 µg/L	111	70.0	130	----
Hydrocarbons (QCLot: 719461)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	106	70.0	130	----

Qualifiers

Qualifier

Description

MES Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 709705)										
VA22C5460-001	BH-4A	fluoride	16984-48-8	E235.F	4.98 mg/L	5 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 709706)										
VA22C5460-001	BH-4A	chloride	16887-00-6	E235.Cl	509 mg/L	500 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 709707)										
VA22C5460-001	BH-4A	bromide	24959-67-9	E235.Br-L	2.46 mg/L	2.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 709708)										
VA22C5460-001	BH-4A	nitrate (as N)	14797-55-8	E235.NO3-L	12.8 mg/L	12.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 709709)										
VA22C5460-001	BH-4A	nitrite (as N)	14797-65-0	E235.NO2-L	2.47 mg/L	2.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 709710)										
VA22C5460-001	BH-4A	sulfate (as SO4)	14808-79-8	E235.SO4	512 mg/L	500 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 714826)										
VA22C5460-002	BH-5B	Kjeldahl nitrogen, total [TKN]	----	E318	2.53 mg/L	2.5 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 714828)										
VA22C5460-002	BH-5B	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 714827)										
VA22C5460-002	BH-5B	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 714829)										
VA22C5460-002	BH-5B	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 710610)										
KS2204038-002	Anonymous	aluminum, dissolved	7429-90-5	E421	2.00 mg/L	2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.213 mg/L	0.2 mg/L	106	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.218 mg/L	0.2 mg/L	109	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.200 mg/L	0.2 mg/L	100.0	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.396 mg/L	0.4 mg/L	98.9	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0906 mg/L	0.1 mg/L	90.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.868 mg/L	1 mg/L	86.8	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.0422 mg/L	0.04 mg/L	105	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 710610) - continued										
KS2204038-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.112 mg/L	0.1 mg/L	112	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.409 mg/L	0.4 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.200 mg/L	0.2 mg/L	99.9	70.0	130	----
		iron, dissolved	7439-89-6	E421	20.3 mg/L	20 mg/L	101	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.995 mg/L	1 mg/L	99.5	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.217 mg/L	0.2 mg/L	109	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.392 mg/L	0.4 mg/L	98.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	115 mg/L	100 mg/L	115	70.0	130	----
		potassium, dissolved	7440-09-7	E421	40.4 mg/L	40 mg/L	101	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.213 mg/L	0.2 mg/L	106	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.446 mg/L	0.4 mg/L	111	70.0	130	----
		silicon, dissolved	7440-21-3	E421	100 mg/L	100 mg/L	100	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.0430 mg/L	0.04 mg/L	107	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	200 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.436 mg/L	0.4 mg/L	109	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.219 mg/L	0.2 mg/L	110	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.395 mg/L	0.4 mg/L	98.8	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	1.06 mg/L	1 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E421	4.02 mg/L	4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.445 mg/L	0.4 mg/L	111	70.0	130	----
Dissolved Metals (QCLot: 711297)										
VA22C5428-005	Anonymous	mercury, dissolved	7439-97-6	E509	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Aggregate Organics (QCLot: 723095)										
VA22C5421-029	Anonymous	chemical oxygen demand [COD]	----	E559-L	108 mg/L	100 mg/L	108	75.0	125	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 719460)										
CG2214810-001	Anonymous	benzene	71-43-2	E611A	87.1 µg/L	100 µg/L	87.1	70.0	130	----
		ethylbenzene	100-41-4	E611A	73.4 µg/L	100 µg/L	73.4	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	88.3 µg/L	100 µg/L	88.3	70.0	130	----
		styrene	100-42-5	E611A	80.9 µg/L	100 µg/L	80.9	70.0	130	----
		toluene	108-88-3	E611A	75.8 µg/L	100 µg/L	75.8	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	145 µg/L	200 µg/L	72.4	70.0	130	----
		xylene, o-	95-47-6	E611A	87.0 µg/L	100 µg/L	87.0	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

CERTIFICATE OF ANALYSIS

Work Order : **VA22C5462**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Surface Water
PO : ----
C-O-C number : ----
Sampler : H Shinton
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 12
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-Oct-2022 11:00
Date Analysis Commenced : 23-Oct-2022
Issue Date : 01-Nov-2022 20:05

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Maqsood UHassan	Laboratory Analyst	Organics, Calgary, Alberta
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Victoria Piguing	Laboratory Analyst	Organics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					SW-09	SW-21	SW-05	SGW-02	SGW-04
Client sampling date / time					18-Oct-2022 12:30	18-Oct-2022 12:00	18-Oct-2022 15:30	18-Oct-2022 13:15	18-Oct-2022 14:40
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-001	VA22C5462-002	VA22C5462-003	VA22C5462-004	VA22C5462-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	314	311	37.8	259	336
conductivity	----	E100	2.0	µS/cm	782	777	192	682	626
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	292	297	48.6	241	344
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	312	318	49.5	266	431
pH	----	E108	0.10	pH units	8.51	8.51	7.55	8.24	8.37
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0292	0.0255	0.0159	0.120	0.0611
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250 ^{DLDS}	<0.250 ^{DLDS}	<0.050	0.245	<0.050
chloride	16887-00-6	E235.Cl	0.50	mg/L	76.2	76.4	34.5	71.1	15.0
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.100 ^{DLDS}	0.041	0.072	0.047
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.814	1.01	1.01	1.48	0.727
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.217	0.213	<0.0050	<0.0050	0.0082
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 ^{DLDS}	<0.0050 ^{DLDS}	<0.0010	<0.0010	<0.0010
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<1.50 ^{DLDS}	<1.50 ^{DLDS}	<0.30	0.34	0.90
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	14.4	28.2	20.7	18.1
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	15.3	17.2	28.6	23.9	21.2
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.150	0.160	0.122	0.0645	16.0
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00012	0.00011	<0.00010	0.00011	0.00099
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00097	0.00105	0.00096	0.00596	0.0279
barium, total	7440-39-3	E420	0.00010	mg/L	0.0591	0.0623	0.0250	0.0774	0.236
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	0.000386
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000167
boron, total	7440-42-8	E420	0.010	mg/L	0.339	0.327	<0.010	0.375	0.017
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000128	0.0000088	<0.0000050	0.0000056	0.00137
calcium, total	7440-70-2	E420	0.050	mg/L	87.8	88.9	14.8	73.7	116
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000012	0.000012	<0.000010	<0.000010	0.00276
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.0169



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-09	SW-21	SW-05	SGW-02	SGW-04
Client sampling date / time					18-Oct-2022 12:30	18-Oct-2022 12:00	18-Oct-2022 15:30	18-Oct-2022 13:15	18-Oct-2022 14:40	
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-001	VA22C5462-002	VA22C5462-003	VA22C5462-004	VA22C5462-005	
					Result	Result	Result	Result	Result	
Total Metals										
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00026	0.00027	0.00056	0.00131	0.0205	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00084	0.00085	0.00055	<0.00050	0.0851	
iron, total	7439-89-6	E420	0.010	mg/L	0.158	0.165	0.940	3.12	40.6	
lead, total	7439-92-1	E420	0.000050	mg/L	0.000059	<0.000050	0.000083	<0.000050	0.0146	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0143	
magnesium, total	7439-95-4	E420	0.0050	mg/L	22.6	23.4	3.05	20.0	34.4	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.205	0.221	0.230	0.890	3.30	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000161	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000688	0.000692	<0.000050	0.000257	0.00180	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00410	0.00426	0.00076	0.00425	0.0340	
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.066	0.068	<0.050	0.169	0.619	
potassium, total	7440-09-7	E420	0.050	mg/L	10.6	10.9	0.962	7.84	3.06	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00181	0.00198	0.00066	0.00178	0.00693	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000079	0.000125	0.000054	0.000140	0.000278	
silicon, total	7440-21-3	E420	0.10	mg/L	4.92	4.88	1.73	5.52	23.9	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000202	
sodium, total	7440-23-5	E420	0.050	mg/L	59.7	61.5	23.2	54.2	8.76	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.595	0.596	0.121	0.516	0.979	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000173	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00069	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00038	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00171	0.00176	0.00113	0.00121	0.206	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000854	0.000872	<0.000010	0.000178	0.000931	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	0.00051	0.0380	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0.0035	<0.0030	0.110	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00031	

Dissolved Metals



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-09	SW-21	SW-05	SGW-02	SGW-04
(Matrix: Water)					Client sampling date / time	18-Oct-2022 12:30	18-Oct-2022 12:00	18-Oct-2022 15:30	18-Oct-2022 13:15	18-Oct-2022 14:40
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-001	VA22C5462-002	VA22C5462-003	VA22C5462-004	VA22C5462-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0157	0.0118	0.0747	0.0271	0.0476	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00011	0.00010	<0.00010	<0.00010	0.00012	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00093	0.00096	0.00085	0.00260	0.00232	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0567	0.0554	0.0233	0.0669	0.103	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.316	0.320	<0.010	0.320	<0.010	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000547	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	82.2	84.0	14.6	66.8	94.4	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00015	0.00016	0.00037	0.00086	0.00444	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00049	0.00052	0.00040	0.00025	0.00158	
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.011	0.011	0.563	1.11	4.08	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000054	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	21.0	21.1	2.96	18.0	26.4	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0526	0.0527	0.108	0.524	2.50	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000700	0.000638	<0.000050	0.000301	0.00186	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00378	0.00382	0.00074	0.00383	0.00617	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	9.96	9.76	0.884	7.24	2.00	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00186	0.00184	0.00057	0.00193	0.00034	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000077	0.000103	0.000052	0.000065	0.000145	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.72	4.76	1.65	5.12	6.15	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	58.2	58.1	21.3	51.3	7.90	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.581	0.566	0.112	0.480	0.856	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-09	SW-21	SW-05	SGW-02	SGW-04
Client sampling date / time					18-Oct-2022 12:30	18-Oct-2022 12:00	18-Oct-2022 15:30	18-Oct-2022 13:15	18-Oct-2022 14:40	
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-001	VA22C5462-002	VA22C5462-003	VA22C5462-004	VA22C5462-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0.00045	0.00055	0.00085	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000748	0.000765	<0.000010	0.000227	0.000668	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00055	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0.0028	0.0010	<0.0010	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00037	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	57	52	86	71	63	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	0.90	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	<100	<100	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	<400	<400	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	<100	<100	



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-09	SW-21	SW-05	SGW-02	SGW-04
(Matrix: Water)					Client sampling date / time	18-Oct-2022 12:30	18-Oct-2022 12:00	18-Oct-2022 15:30	18-Oct-2022 13:15	18-Oct-2022 14:40
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-001	VA22C5462-002	VA22C5462-003	VA22C5462-004	VA22C5462-005	
					Result	Result	Result	Result	Result	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	108	107	114	109	109	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	81.9	97.6	82.6	96.6	90.0	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	80.2	81.1	83.0	79.0	79.9	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	93.8	93.7	94.0	93.2	93.4	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water					Client sample ID	SGW-05	Travel Blank	----	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 11:00	18-Oct-2022	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-006	VA22C5462-007	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	236	---	---	---	---	---
conductivity	----	E100	2.0	µS/cm	430	<2.0	---	---	---	---
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	236	---	---	---	---	---
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	268	<0.60	---	---	---	---
pH	----	E108	0.10	pH units	8.39	---	---	---	---	---
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.127	0.0099 ^{RRV}	---	---	---	---
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	---	---	---	---	---
chloride	16887-00-6	E235.Cl	0.50	mg/L	2.13	---	---	---	---	---
fluoride	16984-48-8	E235.F	0.020	mg/L	0.064	---	---	---	---	---
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.465	---	---	---	---	---
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0232	<0.0050	---	---	---	---
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0022	---	---	---	---	---
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2.54	---	---	---	---	---
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.80	---	---	---	---	---
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	11.0	---	---	---	---	---
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	24.9	<0.0030	---	---	---	---
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00141	<0.00010	---	---	---	---
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0333	<0.00010	---	---	---	---
barium, total	7440-39-3	E420	0.00010	mg/L	0.272	<0.00010	---	---	---	---
beryllium, total	7440-41-7	E420	0.000100	mg/L	0.000645	<0.000100	---	---	---	---
bismuth, total	7440-69-9	E420	0.000050	mg/L	0.000296	<0.000050	---	---	---	---
boron, total	7440-42-8	E420	0.010	mg/L	<0.020 ^{DLA}	<0.010	---	---	---	---
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.00236	<0.0000050	---	---	---	---
calcium, total	7440-70-2	E420	0.050	mg/L	71.6	<0.050	---	---	---	---
cesium, total	7440-46-2	E420	0.000010	mg/L	0.00455	<0.000010	---	---	---	---
chromium, total	7440-47-3	E420	0.00050	mg/L	0.0284	<0.00050	---	---	---	---
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.0365	<0.00010	---	---	---	---



Analytical Results

Sub-Matrix: Water					Client sample ID	SGW-05	Travel Blank	---	---	---
(Matrix: Water)					Client sampling date / time	18-Oct-2022 11:00	18-Oct-2022	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-006	VA22C5462-007	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
copper, total	7440-50-8	E420	0.00050	mg/L	0.143	<0.00050	---	---	---	
iron, total	7439-89-6	E420	0.010	mg/L	291	<0.010	---	---	---	
lead, total	7439-92-1	E420	0.000050	mg/L	0.0270	<0.000050	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0208	<0.0010	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	21.6	<0.0050	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	4.45	<0.00010	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	0.000246	<0.0000050	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00236	<0.000050	---	---	---	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.0610	<0.00050	---	---	---	
phosphorus, total	7723-14-0	E420	0.050	mg/L	1.25	<0.050	---	---	---	
potassium, total	7440-09-7	E420	0.050	mg/L	3.65	<0.050	---	---	---	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0108	<0.00020	---	---	---	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000269	<0.000050	---	---	---	
silicon, total	7440-21-3	E420	0.10	mg/L	35.1	<0.10	---	---	---	
silver, total	7440-22-4	E420	0.000010	mg/L	0.000346	<0.000010	---	---	---	
sodium, total	7440-23-5	E420	0.050	mg/L	5.12	<0.050	---	---	---	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.533	<0.00020	---	---	---	
sulfur, total	7704-34-9	E420	0.50	mg/L	<1.00 ^{DLA}	<0.50	---	---	---	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00040 ^{DLA}	<0.00020	---	---	---	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000307	<0.000010	---	---	---	
thorium, total	7440-29-1	E420	0.00010	mg/L	0.00133	<0.00010	---	---	---	
tin, total	7440-31-5	E420	0.00010	mg/L	0.00082	<0.00010	---	---	---	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.216	<0.00030	---	---	---	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00020 ^{DLA}	<0.00010	---	---	---	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000924	<0.000010	---	---	---	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.0518	<0.00050	---	---	---	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.195	<0.0030	---	---	---	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00040 ^{DLA}	<0.00020	---	---	---	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0134	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	SGW-05	Travel Blank	----	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 11:00	18-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-006	VA22C5462-007	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	---	---	---	---	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00135	---	---	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0637	---	---	---	---	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	---	---	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	---	---	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	---	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000166	---	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	68.1	---	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	---	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00623	---	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00056	---	---	---	---	
iron, dissolved	7439-89-6	E421	0.010	mg/L	1.65	---	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0015	---	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	16.1	---	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	1.32	---	---	---	---	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	---	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00184	---	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00263	---	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.62	---	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00038	---	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	---	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	5.33	---	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	6.44	---	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.558	---	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	0.98	---	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	SGW-05	Travel Blank	----	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 11:00	18-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-006	VA22C5462-007	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	---	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	---	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	---	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000370	---	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	---	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	---	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	---	---	---	---	
dissolved mercury filtration location	----	EP509	-	-	Field	---	---	---	---	
dissolved metals filtration location	----	EP421	-	-	Field	---	---	---	---	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	69	---	---	---	---	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	---	---	---	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	---	---	---	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	---	---	---	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	---	---	---	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	---	---	---	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	---	---	---	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	---	---	---	
VPHw	----	EC580A	100	µg/L	<100	<100	---	---	---	
Hydrocarbons Surrogates										



Analytical Results

Sub-Matrix: Water					Client sample ID	SGW-05	Travel Blank	----	----	----
(Matrix: Water)					Client sampling date / time	18-Oct-2022 11:00	18-Oct-2022	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C5462-006	VA22C5462-007	-----	-----	-----	
					Result	Result	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	107	112	----	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	95.9	97.4	----	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	82.1	82.4	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	93.5	93.3	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C5462</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton Surface Water</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 7</p> <p>No. of samples analysed : 7</p>	<p>Page : 1 of 26</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 20-Oct-2022 11:00</p> <p>Issue Date : 01-Nov-2022 20:06</p>
--	--

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Dissolved Metals	QC-MRG2-7106090 02	----	lithium, dissolved	7439-93-2	E421	122 % ^{MES}	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-02	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-04	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-05	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-05	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-09	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-21	E559-L	18-Oct-2022	----	----	----		31-Oct-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SGW-02	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-04	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-05	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-05	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-09	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-21	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	18-Oct-2022	24-Oct-2022	----	----		26-Oct-2022	28 days	8 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SGW-02	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SGW-04	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SGW-05	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-05	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-09	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-21	E235.Br-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SGW-02	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SGW-04	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SGW-05	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-05	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-09	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-21	E235.Cl	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE SGW-02	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SGW-04	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SGW-05	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-05	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-09	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-21	E235.F	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SGW-02	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SGW-04	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SGW-05	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-05	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-09	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-21	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Travel Blank	E235.NO3-L	18-Oct-2022	25-Oct-2022	3 days	7 days	* EHT	25-Oct-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-02	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-04	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-05	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-05	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-09	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	* EHT	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-21	E235.NO2-L	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	7 days	*	EHT
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-02	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-04	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-05	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-05	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-09	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-21	E235.SO4	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-02	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-04	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-05	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-05	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-09	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-21	E318	18-Oct-2022	24-Oct-2022	----	----		25-Oct-2022	28 days	7 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-02	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-04	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-05	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-05	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-09	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-21	E509	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-02	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-04	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-05	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-05	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-09	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-21	E421	18-Oct-2022	24-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-02	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-04	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-05	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-05	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-09	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-21	E601A	18-Oct-2022	28-Oct-2022	14 days	10 days	✔	29-Oct-2022	40 days	1 days	✔	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Travel Blank	E601A	18-Oct-2022	29-Oct-2022	14 days	11 days	✔	29-Oct-2022	40 days	0 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-02	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-04	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-05	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-05	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-09	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-21	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Travel Blank	E581.VH+F1	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-02	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-04	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-05	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-05	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-09	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-21	E358-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-02	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-04	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-05	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-05	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-09	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-21	E355-L	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	28 days	6 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-02	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-04	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-05	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Alkalinity Species by Titration											
HDPE SW-05	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-09	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-21	E290	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	14 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SGW-02	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SGW-04	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SGW-05	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SW-05	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SW-09	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	
Physical Tests : Conductivity in Water											
HDPE SW-21	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE Travel Blank	E100	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	28 days	8 days	✓	
Physical Tests : pH by Meter											
HDPE SGW-02	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SGW-04	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SGW-05	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SW-05	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SW-09	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SW-21	E108	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	0.25 hrs	12.25 hrs	* EHTR-FM	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-02	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-04	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-05	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-05	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-09	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-21	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) Travel Blank	E508	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-02	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-04	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-05	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-05	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-09	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-21	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	8 days	✔	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE - total (lab preserved) Travel Blank	E420	18-Oct-2022	25-Oct-2022	----	----		26-Oct-2022	180 days	9 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-02	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-04	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-05	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-05	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-09	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-21	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Travel Blank	E611A	18-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	14 days	10 days	✔

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	712478	1	19	5.2	5.0	✔
Ammonia by Fluorescence	E298	711266	1	14	7.1	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	712482	1	16	6.2	5.0	✔
BTEX by Headspace GC-MS	E611A	719460	2	40	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	2	35	5.7	5.0	✔
Chloride in Water by IC	E235.Cl	712481	1	16	6.2	5.0	✔
Conductivity in Water	E100	712479	1	20	5.0	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	710376	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	711267	1	10	10.0	5.0	✔
Fluoride in Water by IC	E235.F	712480	1	16	6.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	712483	1	17	5.8	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	712484	1	19	5.2	5.0	✔
pH by Meter	E108	712477	1	19	5.2	5.0	✔
Sulfate in Water by IC	E235.SO4	712485	1	16	6.2	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	711264	1	18	5.5	5.0	✔
Total Mercury in Water by CVAAS	E508	710231	2	40	5.0	5.0	✔
Total metals in Water by CRC ICPMS	E420	711776	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	711265	1	13	7.6	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	2	11	18.1	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	712478	1	19	5.2	5.0	✔
Ammonia by Fluorescence	E298	711266	1	14	7.1	5.0	✔
BC PHCs - EPH by GC-FID	E601A	718944	2	14	14.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	712482	1	16	6.2	5.0	✔
BTEX by Headspace GC-MS	E611A	719460	2	40	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	2	35	5.7	5.0	✔
Chloride in Water by IC	E235.Cl	712481	1	16	6.2	5.0	✔
Conductivity in Water	E100	712479	1	20	5.0	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	710376	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	711267	1	10	10.0	5.0	✔
Fluoride in Water by IC	E235.F	712480	1	16	6.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	712483	1	17	5.8	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	712484	1	19	5.2	5.0	✔
pH by Meter	E108	712477	1	19	5.2	5.0	✔



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	712485	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	711264	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	710231	2	40	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	711776	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	711265	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	2	11	18.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	712478	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	711266	1	14	7.1	5.0	✓
BC PHCs - EPH by GC-FID	E601A	718944	2	14	14.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	712482	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	719460	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	712481	1	16	6.2	5.0	✓
Conductivity in Water	E100	712479	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	710376	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	711267	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	712480	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712483	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712484	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	712485	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	711264	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	710231	2	40	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	711776	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	711265	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	719461	2	11	18.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	711266	1	14	7.1	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	712482	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	719460	2	40	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	723095	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	712481	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	710376	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	710610	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	711267	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	712480	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712483	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712484	1	19	5.2	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	712485	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	711264	1	18	5.5	5.0	✓
Total Mercury in Water by CVAAS	E508	710231	2	40	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	711776	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	711265	1	13	7.6	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Calgary - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Calgary - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Calgary - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

<p>Work Order : VA22C5462</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone :</p> <p>Project : Hazelton Surface Water</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H Shinton ----</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 7</p> <p>No. of samples analysed : 7</p>	<p>Page : 1 of 22</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 20-Oct-2022 11:00</p> <p>Date Analysis Commenced : 23-Oct-2022</p> <p>Issue Date : 01-Nov-2022 20:05</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Brianna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Maqsood UlHassan	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Victoria Piguing	Laboratory Analyst	Calgary Organics, Calgary, Alberta

Page : 2 of 22
Work Order : VA22C5462
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 712477)											
VA22C5462-003	SW-05	pH	----	E108	0.10	pH units	7.55	7.57	0.251%	4%	----
Physical Tests (QC Lot: 712478)											
VA22C5462-003	SW-05	alkalinity, total (as CaCO ₃)	----	E290	1.0	mg/L	37.8	38.2	1.29%	20%	----
Physical Tests (QC Lot: 712479)											
VA22C5462-003	SW-05	conductivity	----	E100	2.0	µS/cm	192	191	0.313%	10%	----
Anions and Nutrients (QC Lot: 711264)											
VA22C5406-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.830	0.828	0.258%	20%	----
Anions and Nutrients (QC Lot: 711266)											
VA22C5406-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0762	0.0714	6.50%	20%	----
Anions and Nutrients (QC Lot: 712480)											
VA22C5462-001	SW-09	fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712481)											
VA22C5462-001	SW-09	chloride	16887-00-6	E235.Cl	2.50	mg/L	76.2	76.1	0.0817%	20%	----
Anions and Nutrients (QC Lot: 712482)											
VA22C5462-001	SW-09	bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712483)											
VA22C5462-001	SW-09	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.217	0.214	0.0029	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712484)											
VA22C5462-001	SW-09	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	0.0062	0.0012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712485)											
VA22C5462-001	SW-09	sulfate (as SO ₄)	14808-79-8	E235.SO4	1.50	mg/L	<1.50	<1.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 711265)											
VA22C5406-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	67.4	68.4	1.51%	20%	----
Organic / Inorganic Carbon (QC Lot: 711267)											
VA22C5462-001	SW-09	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.3	14.4	7.87%	20%	----
Total Metals (QC Lot: 710231)											
VA22C5396-003	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 710232)											
VA22C5462-004	SGW-02	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 711776)											



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 711776) - continued											
VA22C5462-001	SW-09	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.150	0.159	6.07%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00012	0.00011	0.000006	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00097	0.00110	12.7%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0591	0.0618	4.43%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.339	0.353	4.18%	20%	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000128	0.0000143	0.0000015	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	87.8	89.6	1.94%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000012	0.000012	0.0000005	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00026	0.00027	0.000005	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00084	0.00084	0.000001	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.158	0.162	3.00%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000059	<0.000050	0.000009	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	22.6	23.2	2.32%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.205	0.207	1.18%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000688	0.000683	0.747%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00410	0.00412	0.00002	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.066	<0.050	0.016	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	10.6	10.8	2.81%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00181	0.00190	0.00009	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000079	0.000112	0.000032	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	4.92	4.99	1.34%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	59.7	61.1	2.30%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.595	0.602	1.12%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00171	0.00168	0.00003	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 711776) - continued											
VA22C5462-001	SW-09	tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000854	0.000864	1.19%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	0.00051	0.00001	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 710376)											
VA22C5430-003	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 710610)											
KS2204038-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.00258	0.00259	0.000009	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.305	0.309	0.004	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	459	464	1.09%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	0.000835	0.000843	0.000008	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.00280	0.00286	0.00006	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00308	0.00316	0.00008	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.279	0.288	3.35%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	1110	1110	0.307%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.230	0.229	0.228%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.000744	0.000695	0.000049	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	11.1	11.2	1.37%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.0114	0.0107	0.00068	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	0.0102	0.0111	7.61%	20%	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	22.1	22.4	1.64%	20%	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 710610) - continued											
KS2204038-001	Anonymous	sodium, dissolved	7440-23-5	E421	0.500	mg/L	387	390	0.704%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	11.2	11.5	2.83%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	1980	1990	0.969%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.00759	0.00751	1.14%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 723095)											
VA22C5421-028	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 723096)											
VA22C5462-003	SW-05	chemical oxygen demand [COD]	----	E559-L	10	mg/L	86	89	3	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 719460)											
CG2214810-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 719465)											
CG2214888-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	0.0453 mg/L	46.5	2.72%	30%	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	0.0453 mg/L	41.3	9.13%	30%	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	0.0990 mg/L	84.7	15.5%	30%	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	0.00141 mg/L	1.25	0.15	Diff <2x LOR	----

Page : 7 of 22
 Work Order : VA22C5462
 Client : Regional District of Kitimat-Stikine
 Project : Hazelton Surface Water



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Hydrocarbons (QC Lot: 719461)											
VA22C5460-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 719466)											
VA22C5462-003	SW-05	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 712478)						
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
Physical Tests (QCLot: 712479)						
conductivity	---	E100	1	µS/cm	<1.0	---
Anions and Nutrients (QCLot: 711264)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 711266)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 712480)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 712481)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 712482)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 712483)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 712484)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 712485)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Organic / Inorganic Carbon (QCLot: 711265)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 711267)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 710231)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
Total Metals (QCLot: 710232)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
Total Metals (QCLot: 711776)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 711776) - continued						
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 710376)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 710610)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 710610) - continued						
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Aggregate Organics (QCLot: 723095)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 723096)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 719460)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 719465)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 718944)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 719461)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 719466)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 720617)						

Page : 12 of 22
Work Order : VA22C5462
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Hydrocarbons (QCLot: 720617) - continued						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	
Physical Tests (QCLot: 712477)									
pH	----	E108	----	pH units	7 pH units	99.9	98.0	102	----
Physical Tests (QCLot: 712478)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Physical Tests (QCLot: 712479)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.0	90.0	110	----
Anions and Nutrients (QCLot: 711264)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	91.7	75.0	125	----
Anions and Nutrients (QCLot: 711266)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 712480)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 712481)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 712482)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 712483)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 712484)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 712485)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Organic / Inorganic Carbon (QCLot: 711265)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 711267)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 710231)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	100	80.0	120	----
Total Metals (QCLot: 710232)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 711776)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	105	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.8	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	97.9	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	100	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.6	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	116	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	109	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.4	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	85.2	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.8	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	107	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 711776) - continued									
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	108	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	97.7	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 710610)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	108	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	110	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	109	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.8	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	94.5	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	113	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	# 122	80.0	120	MES
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	109	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	118	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	112	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	99.6	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	108	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 710610) - continued									
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	96.1	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	100	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	107	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Aggregate Organics (QCLot: 723095)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	108	85.0	115	----
Aggregate Organics (QCLot: 723096)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	109	85.0	115	----
Volatile Organic Compounds (QCLot: 719460)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	85.7	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	79.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	91.3	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	81.6	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	79.4	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	84.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	86.3	70.0	130	----
Volatile Organic Compounds (QCLot: 719465)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	92.5	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	80.0	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	94.9	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	80.7	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	82.8	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	80.1	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	86.2	70.0	130	----
Hydrocarbons (QCLot: 718944)									
EPH (C10-C19)	----	E601A	250	µg/L	6638.596 µg/L	119	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3614.035 µg/L	119	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	10238.59 µg/L	111	70.0	130	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					<i>Spike</i>	<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		<i>Qualifier</i>
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Concentration</i>	<i>LCS</i>	<i>Low</i>	<i>High</i>	
Hydrocarbons (QCLot: 719461)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	106	70.0	130	----
Hydrocarbons (QCLot: 719466)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	105	70.0	130	----
Hydrocarbons (QCLot: 720617)									
EPH (C10-C19)	----	E601A	250	µg/L	6638.596 µg/L	123	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3614.035 µg/L	124	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	10238.59 µg/L	114	70.0	130	----

Qualifiers

<i>Qualifier</i>	<i>Description</i>
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 711264)										
VA22C5406-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.41 mg/L	2.5 mg/L	96.4	70.0	130	----
Anions and Nutrients (QCLot: 711266)										
VA22C5406-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 712480)										
VA22C5462-002	SW-21	fluoride	16984-48-8	E235.F	5.21 mg/L	5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 712481)										
VA22C5462-002	SW-21	chloride	16887-00-6	E235.Cl	516 mg/L	500 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 712482)										
VA22C5462-002	SW-21	bromide	24959-67-9	E235.Br-L	2.68 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 712483)										
VA22C5462-002	SW-21	nitrate (as N)	14797-55-8	E235.NO3-L	13.0 mg/L	12.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 712484)										
VA22C5462-002	SW-21	nitrite (as N)	14797-65-0	E235.NO2-L	2.42 mg/L	2.5 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 712485)										
VA22C5462-002	SW-21	sulfate (as SO4)	14808-79-8	E235.SO4	524 mg/L	500 mg/L	105	75.0	125	----
Organic / Inorganic Carbon (QCLot: 711265)										
VA22C5406-002	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 711267)										
VA22C5462-002	SW-21	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 710231)										
VA22C5407-001	Anonymous	mercury, total	7439-97-6	E508	0.0000980 mg/L	0.0001 mg/L	98.0	70.0	130	----
Total Metals (QCLot: 710232)										
VA22C5462-005	SGW-04	mercury, total	7439-97-6	E508	ND mg/L	0.0001 mg/L	ND	70.0	130	----
Total Metals (QCLot: 711776)										
VA22C5462-002	SW-21	aluminum, total	7429-90-5	E420	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		antimony, total	7440-36-0	E420	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 711776) - continued										
VA22C5462-002	SW-21	beryllium, total	7440-41-7	E420	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00961 mg/L	0.01 mg/L	96.1	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00406 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0101 mg/L	0.01 mg/L	101	70.0	130	----
		chromium, total	7440-47-3	E420	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0196 mg/L	0.02 mg/L	98.3	70.0	130	----
		copper, total	7440-50-8	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		iron, total	7439-89-6	E420	2.00 mg/L	2 mg/L	100	70.0	130	----
		lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.0956 mg/L	0.1 mg/L	95.6	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0211 mg/L	0.02 mg/L	105	70.0	130	----
		nickel, total	7440-02-0	E420	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		phosphorus, total	7723-14-0	E420	11.1 mg/L	10 mg/L	111	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		silicon, total	7440-21-3	E420	9.17 mg/L	10 mg/L	91.7	70.0	130	----
		silver, total	7440-22-4	E420	0.00420 mg/L	0.004 mg/L	105	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	21.3 mg/L	20 mg/L	107	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		thallium, total	7440-28-0	E420	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		thorium, total	7440-29-1	E420	0.0221 mg/L	0.02 mg/L	111	70.0	130	----
		tin, total	7440-31-5	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, total	7440-32-6	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		uranium, total	7440-61-1	E420	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, total	7440-62-2	E420	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, total	7440-66-6	E420	0.410 mg/L	0.4 mg/L	103	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0425 mg/L	0.04 mg/L	106	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 710376)										
VA22C5430-004	Anonymous	mercury, dissolved	7439-97-6	E509	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 710610)										
KS2204038-002	Anonymous	aluminum, dissolved	7429-90-5	E421	2.00 mg/L	2 mg/L	100	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.213 mg/L	0.2 mg/L	106	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.218 mg/L	0.2 mg/L	109	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.200 mg/L	0.2 mg/L	100.0	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.396 mg/L	0.4 mg/L	98.9	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0906 mg/L	0.1 mg/L	90.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.868 mg/L	1 mg/L	86.8	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.112 mg/L	0.1 mg/L	112	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.409 mg/L	0.4 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.200 mg/L	0.2 mg/L	99.9	70.0	130	----
		iron, dissolved	7439-89-6	E421	20.3 mg/L	20 mg/L	101	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.995 mg/L	1 mg/L	99.5	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.217 mg/L	0.2 mg/L	109	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.392 mg/L	0.4 mg/L	98.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	115 mg/L	100 mg/L	115	70.0	130	----
		potassium, dissolved	7440-09-7	E421	40.4 mg/L	40 mg/L	101	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.213 mg/L	0.2 mg/L	106	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.446 mg/L	0.4 mg/L	111	70.0	130	----
		silicon, dissolved	7440-21-3	E421	100 mg/L	100 mg/L	100	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.0430 mg/L	0.04 mg/L	107	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	200 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.436 mg/L	0.4 mg/L	109	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.219 mg/L	0.2 mg/L	110	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 710610) - continued										
KS2204038-002	Anonymous	titanium, dissolved	7440-32-6	E421	0.395 mg/L	0.4 mg/L	98.8	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	1.06 mg/L	1 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E421	4.02 mg/L	4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.445 mg/L	0.4 mg/L	111	70.0	130	----
Aggregate Organics (QCLot: 723095)										
VA22C5421-029	Anonymous	chemical oxygen demand [COD]	----	E559-L	108 mg/L	100 mg/L	108	75.0	125	----
Aggregate Organics (QCLot: 723096)										
VA22C5462-004	SGW-02	chemical oxygen demand [COD]	----	E559-L	103 mg/L	100 mg/L	103	75.0	125	----
Volatile Organic Compounds (QCLot: 719460)										
CG2214810-001	Anonymous	benzene	71-43-2	E611A	87.1 µg/L	100 µg/L	87.1	70.0	130	----
		ethylbenzene	100-41-4	E611A	73.4 µg/L	100 µg/L	73.4	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	88.3 µg/L	100 µg/L	88.3	70.0	130	----
		styrene	100-42-5	E611A	80.9 µg/L	100 µg/L	80.9	70.0	130	----
		toluene	108-88-3	E611A	75.8 µg/L	100 µg/L	75.8	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	145 µg/L	200 µg/L	72.4	70.0	130	----
		xylene, o-	95-47-6	E611A	87.0 µg/L	100 µg/L	87.0	70.0	130	----
Volatile Organic Compounds (QCLot: 719465)										
CG2214888-001	Anonymous	benzene	71-43-2	E611A	90.2 µg/L	100 µg/L	90.2	70.0	130	----
		ethylbenzene	100-41-4	E611A	84.9 µg/L	100 µg/L	84.9	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	90.2 µg/L	100 µg/L	90.2	70.0	130	----
		styrene	100-42-5	E611A	85.6 µg/L	100 µg/L	85.6	70.0	130	----
		toluene	108-88-3	E611A	81.0 µg/L	100 µg/L	81.0	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	186 µg/L	200 µg/L	93.2	70.0	130	----
		xylene, o-	95-47-6	E611A	87.8 µg/L	100 µg/L	87.8	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.





Chain of Custody (COC) / Analytical Request Form

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																				
Company: Regional District of Kitimat-Stikine		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																				
Contact: Hannah Shinton		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/>			EMERGENCY 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																	
Phone: 250-615-6100		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:																				
Company address below will appear on the final report		Email 1 or Fax hshinton@rdks.bc.ca			For tests that can not be performed according to the service level selected, you will be contacted.																				
Street: 4545 Lazelle Avenue		Email 2 enviro.dept@rdks.bc.ca			Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																				
City/Province: Terrace/BC		Email 3																							
Postal Code: V8G4E1																									
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution																							
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																							
Company: Regional District of Kitimat-Stikine		Email 1 or Fax anne-maries@rdks.bc.ca, hshinton@rdks.bc.ca																							
Contact: Hannah Shinton		Email 2 enviro.dept@rdks.bc.ca																							
Project Information		Oil and Gas Required Fields (client use)																							
ALS Account # / Quote #: VA19-RDKS100-001		AFE/Cost Center:	PO#:																						
Job #: Hazelton Surface Water		Major/Minor Code:	Routing Code:																						
PO / AFE:		Requisitioner:																							
LSD:		Location:																							
ALS Lab Work Order # (lab use only): 5462		ALS Contact:		Sampler: H. Shinton																					
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)				Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Total Metals	Dissolved Metals	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, sulphate, hardness	Ammonia	Nitrate	Nitrite	Total Kjeldahl Nitrogen	TOC	pH	COD	Conductivity	EPH	BTEX / VPH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS
	SW-09				18-Oct-22	12:30	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	SW-21				18-Oct-22	12:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	SW-05				18-Oct-22	15:30	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	SGW-02				18-Oct-22	13:15	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	SGW-04				18-Oct-22	14:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	SGW-05				18-Oct-22	11:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	Travel Blank				18-Oct-22		Water	R	R											R	R	R			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																				
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/>																				
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					INITIAL COOLER TEMPERATURES °C: 7.7 FINAL COOLER TEMPERATURES °C: 6°C, 4°C, 2°C																				
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																				
Released by: Hannah Shinton	Date: Oct. 19 2022	Time:	Received by: Chris	Date: 19 Oct 22	Time: 1555	Received by: DL	Date: 10/20/22	Time: 11:00																	

Environmental Division
Vancouver
Work Order Reference
VA22C5462



Telephone : +1 604 253 4188

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 WHITE - LABORATORY COPY YELLOW - CLIENT COPY
 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



CERTIFICATE OF ANALYSIS

Work Order : **VA22B9557**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 5
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-Aug-2022 12:40
Date Analysis Commenced : 22-Aug-2022
Issue Date : 31-Aug-2022 11:36

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
RRV	<i>Reported result verified by repeat analysis.</i>



Analytical Results

Sub-Matrix: Water					Client sample ID	EQ	Wetland 4 @ Outlet	----	----	----
(Matrix: Water)					Client sampling date / time	18-Aug-2022 13:25	18-Aug-2022 14:10	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B9557-001 Result	VA22B9557-002 Result	-----	-----	-----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	614	319	----	----	----	
conductivity	----	E100	2.0	µS/cm	1540	799	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	497	520	----	----	----	
pH	----	E108	0.10	pH units	7.83	8.44	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	18.4	0.595	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.500 ^{DLDS}	<0.250 ^{DLDS}	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	131	72.3	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.200 ^{DLDS}	<0.100 ^{DLDS}	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	43.7	1.89	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0500 ^{DLDS}	0.0892	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0100 ^{DLDS}	0.0335	----	----	----	
nitrogen, total	7727-37-9	E366	0.030	mg/L	55.8	2.03	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.910 ^{RRV}	0.0021	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	16.4	<1.50 ^{DLDS}	----	----	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	----	18.1	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	94.5	20.3	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	2.54	0.668	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00156	0.00086	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0183	0.0104	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.284	0.262	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	0.000958	0.000381	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	0.995	1.00	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.000147	0.000135	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	134	145	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000335	0.000103	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00950	0.00669	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	EQ	Wetland 4 @ Outlet	----	----	----
Client sampling date / time					18-Aug-2022 13:25	18-Aug-2022 14:10	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B9557-001 Result	VA22B9557-002 Result	-----	-----	-----	
Total Metals										
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.0118	0.00980	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	0.0178	0.0100	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	9.04	5.55	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	0.00282	0.00261	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0041	0.0028	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	39.4	38.4	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	3.73	3.76	----	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.000100 ^{DLM}	<0.0000050	----	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00271	0.00148	----	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.0208	0.0184	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	8.19	2.28	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	35.5	36.1	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0123	0.0112	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000450	0.000348	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	11.1	8.96	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	0.000102	0.000016	----	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	132	124	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	1.01	1.02	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	21.1	16.0	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00073	<0.00020	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000024	0.000017	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	0.00012	0.00011	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	0.00041	0.00045	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.0307	0.00587	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00032	0.00018	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000817	0.000299	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00886	0.00540	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0915	0.0783	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00037	0.00028	----	----	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	262	5.0	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	EQ	Wetland 4 @ Outlet	----	----	----
Client sampling date / time					18-Aug-2022 13:25	18-Aug-2022 14:10	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B9557-001 Result	VA22B9557-002 Result	-----	-----	-----	
Aggregate Organics										
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	289	3.6	----	----	----	
chemical oxygen demand [COD]	----	E559-L	10	mg/L	1130	50	----	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
toluene	108-88-3	E611A	0.50	µg/L	13.9	<0.50	----	----	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	76.3	79.2	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	107	106	----	----	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	700	<250	----	----	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----	
EPH (C10-C32)	----	E601A	400	µg/L	6680	<400	----	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	5980	<250	----	----	----	
TEH (C10-C30), BC	----	E601A	250	µg/L	4850	<250	----	----	----	
VPW	----	EC580A	100	µg/L	<100	<100	----	----	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	93.4	93.4	----	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	83.8	98.5	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B9557	Page	: 1 of 16
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 20-Aug-2022 12:40
PO	: ----	Issue Date	: 31-Aug-2022 11:36
C-O-C number	: ----		
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Organic / Inorganic Carbon	QC-622874-001	----	carbon, dissolved organic [DOC]	----	E358-L	0.92 ^B mg/L	0.5 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] EQ	E550	18-Aug-2022	----	----	----		22-Aug-2022	3 days	4 days	*	EHT
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Wetland 4 @ Outlet	E550	18-Aug-2022	----	----	----		22-Aug-2022	3 days	4 days	*	EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day											
HDPE [BOD HT 3d] EQ	E555	18-Aug-2022	----	----	----		22-Aug-2022	3 days	4 days	*	EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day											
HDPE [BOD HT 3d] Wetland 4 @ Outlet	E555	18-Aug-2022	----	----	----		22-Aug-2022	3 days	4 days	*	EHT
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) EQ	E559-L	18-Aug-2022	----	----	----		29-Aug-2022	28 days	11 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E559-L	18-Aug-2022	----	----	----		29-Aug-2022	28 days	11 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) EQ	E298	18-Aug-2022	29-Aug-2022	----	----		29-Aug-2022	28 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E298	18-Aug-2022	29-Aug-2022	----	----		29-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE EQ	E235.Br-L	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.Br-L	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE EQ	E235.Cl	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Wetland 4 @ Outlet	E235.Cl	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)											
HDPE EQ	E378-U	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	5 days	* EHT	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)											
HDPE Wetland 4 @ Outlet	E378-U	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	5 days	* EHT	
Anions and Nutrients : Fluoride in Water by IC											
HDPE EQ	E235.F	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Wetland 4 @ Outlet	E235.F	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE EQ	E235.NO3-L	18-Aug-2022	23-Aug-2022	3 days	5 days	* EHT	23-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO3-L	18-Aug-2022	23-Aug-2022	3 days	5 days	* EHT	23-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE EQ	E235.NO2-L	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	5 days	* EHT	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Wetland 4 @ Outlet	E235.NO2-L	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	5 days	* EHT	
Anions and Nutrients : Sulfate in Water by IC											
HDPE EQ	E235.SO4	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Wetland 4 @ Outlet	E235.SO4	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) EQ	E318	18-Aug-2022	29-Aug-2022	----	----		30-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E318	18-Aug-2022	29-Aug-2022	----	----		30-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) EQ	E366	18-Aug-2022	29-Aug-2022	----	----		30-Aug-2022	28 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E366	18-Aug-2022	29-Aug-2022	----	----		30-Aug-2022	28 days	12 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EQ	E601A	18-Aug-2022	29-Aug-2022	14 days	11 days	✓	29-Aug-2022	40 days	0 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 4 @ Outlet	E601A	18-Aug-2022	29-Aug-2022	14 days	11 days	✓	29-Aug-2022	40 days	0 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) EQ	E581.VH+F1	18-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	14 days	8 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E581.VH+F1	18-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	14 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Wetland 4 @ Outlet	E358-L	18-Aug-2022	29-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) EQ	E355-L	18-Aug-2022	29-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E355-L	18-Aug-2022	29-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE EQ	E290	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	5 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Physical Tests : Alkalinity Species by Titration											
HDPE Wetland 4 @ Outlet	E290	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	5 days	✓	
Physical Tests : Conductivity in Water											
HDPE EQ	E100	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Physical Tests : Conductivity in Water											
HDPE Wetland 4 @ Outlet	E100	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	5 days	✓	
Physical Tests : pH by Meter											
HDPE EQ	E108	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	6.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Wetland 4 @ Outlet	E108	18-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	6.25 hrs	* EHTR-FM	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) EQ	E508	18-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	9 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 4 @ Outlet	E508	18-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	9 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) EQ	E420	18-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Wetland 4 @ Outlet	E420	18-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) EQ	E611A	18-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E611A	18-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	614191	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	622879	1	2	50.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	613625	1	6	16.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	613646	1	9	11.1	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	614197	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	621248	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	623982	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	614196	1	16	6.2	5.0	✓
Conductivity in Water	E100	614192	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	622874	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	614201	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	614195	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	614194	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	614198	1	16	6.2	5.0	✓
pH by Meter	E108	614190	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	614199	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	622877	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	621471	1	12	8.3	5.0	✓
Total Metals in Water by CRC ICPMS	E420	613687	1	14	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	622875	1	3	33.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	622878	1	4	25.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	621247	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	614191	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	622879	1	2	50.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	624022	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	613625	1	6	16.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	613646	1	9	11.1	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	614197	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	621248	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	623982	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	614196	1	16	6.2	5.0	✓
Conductivity in Water	E100	614192	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	622874	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	614201	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	614195	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	614194	1	17	5.8	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	614198	1	16	6.2	5.0	✓
pH by Meter	E108	614190	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	614199	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	622877	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	621471	1	12	8.3	5.0	✓
Total Metals in Water by CRC ICPMS	E420	613687	1	14	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	622875	1	3	33.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	622878	1	4	25.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	621247	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	614191	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	622879	1	2	50.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	624022	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	613625	1	6	16.6	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	613646	1	9	11.1	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	614197	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	621248	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	623982	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	614196	1	16	6.2	5.0	✓
Conductivity in Water	E100	614192	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	622874	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	614201	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	614195	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	614194	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	614198	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	614199	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	622877	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	621471	1	12	8.3	5.0	✓
Total Metals in Water by CRC ICPMS	E420	613687	1	14	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	622875	1	3	33.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	622878	1	4	25.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	621247	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	622879	1	2	50.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	614197	1	16	6.2	5.0	✓
BTEX by Headspace GC-MS	E611A	621248	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	623982	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	614196	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	622874	1	6	16.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	614201	1	14	7.1	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Fluoride in Water by IC	E235.F	614195	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	614194	1	17	5.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	614198	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	614199	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	622877	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	621471	1	12	8.3	5.0	✓
Total Metals in Water by CRC ICPMS	E420	613687	1	14	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	622875	1	3	33.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	622878	1	4	25.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	621247	1	15	6.6	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22B9557	Page	: 1 of 14
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 20-Aug-2022 12:40
PO	: ----	Date Analysis Commenced	: 22-Aug-2022
C-O-C number	: ----	Issue Date	: 31-Aug-2022 11:43
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

Page : 2 of 14
Work Order : VA22B9557
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 614190)											
VA22B9520-002	Anonymous	pH	----	E108	0.10	pH units	7.20	7.29	1.17%	4%	----
Physical Tests (QC Lot: 614191)											
VA22B9520-002	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	11.0	10.8	1.83%	20%	----
Physical Tests (QC Lot: 614192)											
VA22B9520-002	Anonymous	conductivity	----	E100	2.0	µS/cm	104	105	0.287%	10%	----
Anions and Nutrients (QC Lot: 614194)											
VA22B9483-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.209	0.209	0.107%	20%	----
Anions and Nutrients (QC Lot: 614195)											
VA22B9483-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.078	0.078	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614196)											
VA22B9483-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614197)											
VA22B9483-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614198)											
VA22B9483-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614199)											
VA22B9483-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	36.2	36.1	0.469%	20%	----
Anions and Nutrients (QC Lot: 614201)											
VA22B9520-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0011	0.0010	0.00008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 622875)											
VA22B9377-001	Anonymous	nitrogen, total	7727-37-9	E366	0.300	mg/L	11.4	11.4	0.475%	20%	----
Anions and Nutrients (QC Lot: 622877)											
VA22B9557-001	EQ	Kjeldahl nitrogen, total [TKN]	----	E318	2.50	mg/L	43.7	46.2	5.48%	20%	----
Anions and Nutrients (QC Lot: 622879)											
VA22B9557-001	EQ	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	18.4	19.1	3.69%	20%	----
Organic / Inorganic Carbon (QC Lot: 622874)											
FJ2202215-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	5.18	6.00	14.6%	20%	----
Organic / Inorganic Carbon (QC Lot: 622878)											
KS2203083-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 613687)											
VA22B9533-028	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 613687) - continued											
VA22B9533-028	Anonymous	antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 613687) - continued											
VA22B9533-028	Anonymous	vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 621471)											
VA22B9533-028	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 613625)											
VA22B9538-026	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 613646)											
VA22B9557-002	Wetland 4 @ Outlet	carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	3.6	3.7	2.7%	30%	----
Aggregate Organics (QC Lot: 623982)											
VA22B9533-028	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 621248)											
FJ2202246-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	2.99	2.71	0.28	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	1.76	1.53	0.23	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylylene, m+p-	179601-23-1	E611A	0.40	µg/L	2.06	1.72	0.34	Diff <2x LOR	----
		xylylene, o-	95-47-6	E611A	0.30	µg/L	1.52	1.36	0.15	Diff <2x LOR	----
Hydrocarbons (QC Lot: 621247)											
FJ2202246-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 614191)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 614192)						
conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 614194)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 614195)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 614196)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 614197)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 614198)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 614199)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 614201)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 622875)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 622877)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 622879)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 622874)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	# 0.92	B
Organic / Inorganic Carbon (QCLot: 622878)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 613687)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 613687) - continued						
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 621471)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Aggregate Organics (QCLot: 613625)						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---
Aggregate Organics (QCLot: 613646)						
carbonaceous biochemical oxygen demand [CBOD]	---	E555	2	mg/L	<2.0	---
Aggregate Organics (QCLot: 623982)						
chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	---
Volatile Organic Compounds (QCLot: 621248)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	---
styrene	100-42-5	E611A	0.5	µg/L	<0.50	---
toluene	108-88-3	E611A	0.5	µg/L	<0.50	---
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	---
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	---
Hydrocarbons (QCLot: 621247)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	---
Hydrocarbons (QCLot: 624022)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	---

Qualifiers

Qualifier *Description*

B *Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 614190)									
pH	----	E108	----	pH units	7 pH units	99.9	98.0	102	----
Physical Tests (QCLot: 614191)									
alkalinity, total (as CaCO ₃)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 614192)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
Anions and Nutrients (QCLot: 614194)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	95.9	90.0	110	----
Anions and Nutrients (QCLot: 614195)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	93.1	90.0	110	----
Anions and Nutrients (QCLot: 614196)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	94.8	90.0	110	----
Anions and Nutrients (QCLot: 614197)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	90.9	85.0	115	----
Anions and Nutrients (QCLot: 614198)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	93.8	90.0	110	----
Anions and Nutrients (QCLot: 614199)									
sulfate (as SO ₄)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.3	90.0	110	----
Anions and Nutrients (QCLot: 614201)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 622875)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 622877)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.0	75.0	125	----
Anions and Nutrients (QCLot: 622879)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.0	85.0	115	----
Organic / Inorganic Carbon (QCLot: 622874)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 622878)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	113	80.0	120	----
Total Metals (QCLot: 613687)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.2	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QLot: 613687) - continued									
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	97.9	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	97.3	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	90.4	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	97.4	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.7	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	95.6	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	94.5	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	95.0	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	95.2	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	95.2	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.2	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	96.5	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	97.5	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	95.6	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	99.9	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	96.6	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.5	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	91.9	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	97.3	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	93.1	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	98.4	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	93.0	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	96.0	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	91.6	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	95.7	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	92.3	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	97.4	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	98.3	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	94.2	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 621471)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Aggregate Organics (QCLot: 613625)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	91.1	85.0	115	----
Aggregate Organics (QCLot: 613646)									
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	98.4	85.0	115	----
Aggregate Organics (QCLot: 623982)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	98.4	85.0	115	----
Volatile Organic Compounds (QCLot: 621248)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	92.3	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	86.1	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	113	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	86.3	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	86.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	91.8	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	85.3	70.0	130	----
Hydrocarbons (QCLot: 621247)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	114	70.0	130	----
Hydrocarbons (QCLot: 624022)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	104	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	107	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	105	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 614194)										
VA22B9520-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.48 mg/L	2.5 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 614195)										
VA22B9520-001	Anonymous	fluoride	16984-48-8	E235.F	0.958 mg/L	1 mg/L	95.8	75.0	125	----
Anions and Nutrients (QCLot: 614196)										
VA22B9520-001	Anonymous	chloride	16887-00-6	E235.Cl	98.2 mg/L	100 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 614197)										
VA22B9520-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.470 mg/L	0.5 mg/L	94.1	75.0	125	----
Anions and Nutrients (QCLot: 614198)										
VA22B9520-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.486 mg/L	0.5 mg/L	97.2	75.0	125	----
Anions and Nutrients (QCLot: 614199)										
VA22B9520-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	98.3 mg/L	100 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 614201)										
VA22B9520-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0302 mg/L	0.03 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 622875)										
VA22B9557-001	EQ	nitrogen, total	7727-37-9	E366	ND mg/L	16 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 622877)										
VA22B9557-002	Wetland 4 @ Outlet	Kjeldahl nitrogen, total [TKN]	----	E318	2.71 mg/L	2.5 mg/L	108	70.0	130	----
Anions and Nutrients (QCLot: 622879)										
VA22B9557-002	Wetland 4 @ Outlet	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 622874)										
FJ2202215-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 622878)										
VA22B9557-001	EQ	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 613687)										
VA22B9538-029	Anonymous	aluminum, total	7429-90-5	E420	0.194 mg/L	0.2 mg/L	97.1	70.0	130	----
		antimony, total	7440-36-0	E420	0.0219 mg/L	0.02 mg/L	109	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		barium, total	7440-39-3	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0422 mg/L	0.04 mg/L	105	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 613687) - continued										
VA22B9538-029	Anonymous	bismuth, total	7440-69-9	E420	0.0106 mg/L	0.01 mg/L	106	70.0	130	----
		boron, total	7440-42-8	E420	0.100 mg/L	0.1 mg/L	99.9	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		calcium, total	7440-70-2	E420	4.36 mg/L	4 mg/L	109	70.0	130	----
		cesium, total	7440-46-2	E420	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		chromium, total	7440-47-3	E420	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		copper, total	7440-50-8	E420	0.0205 mg/L	0.02 mg/L	103	70.0	130	----
		iron, total	7439-89-6	E420	2.06 mg/L	2 mg/L	103	70.0	130	----
		lead, total	7439-92-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		lithium, total	7439-93-2	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		magnesium, total	7439-95-4	E420	0.997 mg/L	1 mg/L	99.7	70.0	130	----
		manganese, total	7439-96-5	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		nickel, total	7440-02-0	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.19 mg/L	10 mg/L	91.9	70.0	130	----
		potassium, total	7440-09-7	E420	4.00 mg/L	4 mg/L	100.0	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		selenium, total	7782-49-2	E420	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
		silicon, total	7440-21-3	E420	9.84 mg/L	10 mg/L	98.4	70.0	130	----
		silver, total	7440-22-4	E420	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		sodium, total	7440-23-5	E420	2.01 mg/L	2 mg/L	100	70.0	130	----
		strontium, total	7440-24-6	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		sulfur, total	7704-34-9	E420	20.8 mg/L	20 mg/L	104	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
		thallium, total	7440-28-0	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		thorium, total	7440-29-1	E420	0.0220 mg/L	0.02 mg/L	110	70.0	130	----
		tin, total	7440-31-5	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		titanium, total	7440-32-6	E420	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0217 mg/L	0.02 mg/L	108	70.0	130	----
		uranium, total	7440-61-1	E420	0.00410 mg/L	0.004 mg/L	102	70.0	130	----
		vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E420	0.413 mg/L	0.4 mg/L	103	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0433 mg/L	0.04 mg/L	108	70.0	130	----
Total Metals (QCLot: 621471)										
VA22B9538-029	Anonymous	mercury, total	7439-97-6	E508	0.0000934 mg/L	0.0001 mg/L	93.4	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organics (QCLot: 623982)										
VA22B9557-001	EQ	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 621248)										
FJ2202246-001	Anonymous	benzene	71-43-2	E611A	92.5 µg/L	100 µg/L	92.5	60.0	140	----
		ethylbenzene	100-41-4	E611A	81.7 µg/L	100 µg/L	81.7	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	114 µg/L	100 µg/L	114	60.0	140	----
		styrene	100-42-5	E611A	84.6 µg/L	100 µg/L	84.6	60.0	140	----
		toluene	108-88-3	E611A	83.2 µg/L	100 µg/L	83.2	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	174 µg/L	200 µg/L	87.2	60.0	140	----
		xylene, o-	95-47-6	E611A	82.4 µg/L	100 µg/L	82.4	60.0	140	----
Hydrocarbons (QCLot: 621247)										
FJ2202246-002	Anonymous	VHw (C6-C10)	----	E581.VH+F1	4520 µg/L	6310 µg/L	71.7	60.0	140	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.



Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to																																		
Company:	Regional District of Kitimat-Stikine	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm																																		
Contact:	Hannah Shinton	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>				EMERGENCY	1 Business Day																												
Phone:	250-641-4141	<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>					Same Day, W (Laboratory)																												
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				2 day [P2-50%] <input type="checkbox"/>																																	
Street:	4545 Lazelle Avenue	Email 1 or Fax: hshinton@rdks.bc.ca			Date and Time Required for all E&P TATs:																																		
City/Province:	Terrace/BC	Email 2: enviro.dept@rdks.bc.ca			For tests that can not be performed according to the service level selected:																																		
Postal Code:	V8G4E1	Email 3:			Analysis Request																																		
Invoice To	Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																		
	Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			P | | | | P | | | F/P | P | | P | F/P | | P | P | P																																		
Company:	Regional District of Kitimat-Stikine	Email 1 or Fax: anne-maries@rdks.bc.ca			Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	DOC	BOD, Conductivity, pH	Total Kjeldahl Nitrogen	EPH, VPH/BTEX	CBOD	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS																	
Contact:	Nicole Lavoie	Email 2: hshinton@rdks.bc.ca, enviro.dept@rdks.bc.ca																																					
Project Information		Oil and Gas Required Fields (client use)																																					
ALS Account # / Quote #:		AFE/Cost Center:		PO#:																																			
Job #:	Hazleton WMF Treated Leachate at Wetland 4	Major/Minor Code:		Routing Code:																																			
PO / AFE:		Requisitioner:																																					
LSD:		Location:																																					
ALS Lab Work Order # (lab use only):		ALS Contact:		Sampler:																																			
				H. Shinton																																			
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																			
	EQ	18 Aug-22	13:25	Effluent	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																				
	Wetland 4 @ Outlet	18 Aug-22	14:10	Effluent	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																				
Terrace Shipping # \ Coolers Ground <input type="checkbox"/> # Carboys Air <input checked="" type="checkbox"/> SFX <input type="checkbox"/>																																							
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)																																					
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)																																					
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO																																							
					SAMPLE CONDITION AS RECEIVED (lab use only)																																		
					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																		
					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																		
					Cooling Initiated <input type="checkbox"/>																																		
					INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																													
															4																								
SHIPMENT RELEASE (client use)					INITIAL SHIPMENT RECEPTION (lab use only)					FINAL SHIPMENT RECEPTION (lab use only)																													
Released by: Hannah Shinton		Date: Friday, August 19th, 2022		Time:	Received by: Jennifer Ruchatzke		Date: Aug-19/20		Time: 11:15	Received by: JC		Date: AUG 20 2022		Time: 12:40 PM																									

CERTIFICATE OF ANALYSIS

<p>Work Order : VA22C4635</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton EQ LC50</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 1</p> <p>No. of samples analysed : 1</p>	<p>Page : 1 of 2</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby BC Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 12-Oct-2022 21:20</p> <p>Date Analysis Commenced : 14-Oct-2022</p> <p>Issue Date : 02-Nov-2022 09:58</p>
---	--

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Paolo Obillo	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Effluent
 (Matrix: Water)

					Client sample ID	Wetland 4 Outlet	----	----	----	----
					Client sampling date / time	11-Oct-2022 11:48	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C4635-001	-----	-----	-----	-----	
					Result	----	----	----	----	
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached	----	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA22C4635</p> <p>Client : Regional District of Kitimat-Stikine</p> <p>Contact : Hannah Shinton</p> <p>Address : # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1</p> <p>Telephone : ----</p> <p>Project : Hazelton EQ LC50</p> <p>PO : ----</p> <p>C-O-C number : ----</p> <p>Sampler : H. Shinton</p> <p>Site :</p> <p>Quote number : Default Water Testing (Q62338)</p> <p>No. of samples received : 1</p> <p>No. of samples analysed : 1</p>	<p>Page : 1 of 4</p> <p>Laboratory : Vancouver - Environmental</p> <p>Account Manager : Amber Springer</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 12-Oct-2022 21:20</p> <p>Issue Date : 02-Nov-2022 09:58</p>
---	---

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Bioassays : Survival/LC50 Daphnia Magna 48 hours										
LDPE carboy Wetland 4 Outlet	DAP-LC50-48	11-Oct-2022	----	----	----		14-Oct-2022	5 days	3 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

- No Quality Control data available for this section.



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Burnaby) - 8664 Commerce Court Burnaby British Columbia Canada V5A 4N7	Water	EPS1/RM/14	See attached report.

QUALITY CONTROL REPORT

Work Order	: VA22C4635	Page	: 1 of 2
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 12-Oct-2022 21:20
PO	: ----	Date Analysis Commenced	: 14-Oct-2022
C-O-C number	: ----	Issue Date	: 02-Nov-2022 09:58
Sampler	: H. Shinton ----		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Paolo Obillo	Account Manager Assistant	Nautilus Environmental (Burnaby) External Subcontracting, Burnaby, British Columbia

Page : 2 of 2
Work Order : VA22C4635
Client : Regional District of Kitimat-Stikine
Project : Hazelton EQ LC50



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Acute Toxicity Test Results

Sample VA22C4635-001 (Wetland 4 Outlet),
collected October 11, 2022

Final Report

November 2, 2022

Submitted to: **ALS Environmental**
Burnaby, BC

SAMPLE INFORMATION

Sample ID	Dates			Receipt temp.
	Collected	Received	<i>Daphnia magna</i> test initiation	
VA22C4635-001 (Wetland 4 Outlet)	11-Oct-22 at 1148h	13-Oct-22 at 0845h	14-Oct-22 at 1435h	8.8–8.9°C

TESTS

- *Daphnia magna* 48-h LC50 test

RESULTS

Toxicity test results

Sample ID	LC50 (% v/v)
VA22C4635-001 (Wetland 4 Outlet)	>100

LC = Lethal Concentration

QA/QC

QA/QC summary	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	4.5 (3.8 – 5.4) g/L NaCl ¹
Reference toxicant historical mean (2 SD range)	5.0 (3.7 – 6.8) g/L NaCl
Reference toxicant CV	15%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date: October 11, 2022, LC = Lethal Concentration, SD = Standard Deviation, CL = Confidence Limits, CV = Coefficient of Variation



Report By:
Kiyeon Lee, B.Sc.
Laboratory Biologist



Reviewed By:
Stephanie Hans, M.Sc.
Project Biologist

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

APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 48-h *Daphnia magna* LC50 test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24-hour old neonates
Test type	Static
Test duration	48 hours
Test vessel	250-mL glass beaker
Test volume	200 mL
Test solution depth	6 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Moderately-hard reconstituted water + 2.5 µg/L Se
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen and pH measured daily; salinity, hardness and alkalinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/14, with 2016 amendments
Statistical software	CETIS Version 2.1.1
Test endpoints	Survival (48-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Sodium chloride (NaCl)

Daphnia magna Summary Sheet

Client: AUS Environmental
Work Order No.: 022093

Start Date/Time: Oct. 14, 2022 @ 1435h
Test Species: Daphnia magna
Set up by: HJ / YUL

Sample Information:

Sample ID: VA22C4635-001 (wetland 4 outlet)
Sample Date: Oct. 11, 2022
Date Received: Oct. 13, 2022
Sample Volume: 2x 1L

Test Validity Criteria:
≥ 90% mean control survival and/or mobility and ≤ 2 daphnids exhibit immobility and/or mortality in any single control replicate.

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 0928228
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 37
Mortality (%) in previous 7 d: 0
Days to first brood: 7

NaCl Reference Toxicant Results:

Reference Toxicant ID: DmDC 108
Stock Solution ID: 22Na02
Date Initiated: Oct. 11, 2022
48-h LC50 (95% CL): 4.5 (3.8 - 5.4) g/L NaCl

Reference Toxicant Mean and Historical Range: 5.0 (3.7 - 6.8) g/L NaCl
Reference Toxicant CV (%): 15%

Test Results: The 48h LC50 is estimated to be >100% CV/V.

Reviewed by: SMH

Date reviewed: Nov 1, 2022

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: ALS Environmental
 Sample ID: VA 22 C 4635 001 (wetland 4
 Work Order No.: 222093 outlet)
 CER #: 5

Start Date/Time: October 14, 2022 @ 1435h
 Test Organism: D. magna
 # Organisms/volume: 10/200mL
 Set up by: HJ/Yul

Thermometer: CER#5 pH meter/probe: 6 / 6 DO meter/probe: 6 / 6 Cond./Salinity meter/probe: 6 / 6

Concentration % (v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized 48	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		0	24	48	0	24	48	0	24	48	0	48
control	A	10	10	0	19.0	19.5	20.0	8.4	8.4	8.5	7.6	7.7	7.7	358	360
	B														
	C														
	D														
6.25	A	10	10	0	19.0	19.5	20.0	8.3	8.3	8.4	7.7	7.7	7.7	383	385
	B														
	C														
	D														
12.5	A	10	10	0	19.0	19.5	20.0	8.4	8.3	8.5	7.7	7.7	7.8	410	413
	B														
	C														
	D														
25	A	10	10	0	19.0	19.5	19.5	8.4	8.3	8.5	7.7	7.7	7.8	461	462
	B														
	C														
	D														
50	A	10	10	0	19.0	19.5	19.5	8.3	8.3	8.4	7.6	7.7	7.9	567	566
	B														
	C														
	D														
100	A	10	10	0	19.5	19.5	19.5	7.6	8.1	8.3	7.5	7.8	8.0	794	778
	B														
	C														
	D														
Technician Initials		SM	YUL	YUL	HJ/SM	YUL	HJ/SM	YUL	HJ/SM	YUL	HJ/SM	YUL	HJ/SM	YUL	YUL

	Hardness*	Alkalinity*
	*(mg/L as CaCO ₃)	
Concentration		
Control (MHW)	100	80
Highest conc.	250	250
Hardness adjusted	-	

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	19.5		
DO (mg/L)	7.6		
pH	7.5		
Cond (µS/cm)	794		
Salinity (ppt)	0.4		

Sample Description: slight yellow tint, clear, odorless, no particulates
 Comments: _____ Mortality: Heartbeat checked under microscope NIA

Batch#: 092822B 7-d previous # young/brood: 32 Previous 7-d Mortality (%): 0 Day of 1st Brood: 7

Reviewed by: SMH Date reviewed: Nov 1, 2022

APPENDIX B – Chain-of-custody form



Chain of Custody
 Vancouver - Environmental
 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9

PREVIEW DOC

Destination Lab: **Nautilus Environmental (Burnaby)**
 Address: 8664 Commerce Court Burnaby BC
 Canada V5A 4N7
 Work Order Number: **VA22C4635**
 Original Receipt Date/Time: 12/10/2022 21:20
 Instructions Received

Relinquished By
 Date/Time
 Received By
 Date/Time
 Receipt Temp

Return as Indicated: Results: alsev.datasublet@alsglobal.com Invoice: alsev.datasublet@alsglobal.com Electronic Data: alsev.datasublet@alsglobal.com
 Attention: Amber Springer

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA22C4635-001	Wetland 4 Outlet	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	24-10-2022	11/10/2022 11:48	2x1C 8-8-8-9
VA22C4635-001	Wetland 4 Outlet	Water	LDPE carboy			24-10-2022	11/10/2022 11:48	

Rec'd
 Oct. 13/22
 @0845h

YUL

WO# 222093

END OF REPORT



CERTIFICATE OF ANALYSIS

Work Order : **VA22B6060**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton EQ LC50
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 2
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 13-Jul-2022 16:15
Date Analysis Commenced : 14-Jul-2022
Issue Date : 29-Jul-2022 11:04

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Trace Chometsky	Account Manager Assistant	External Subcontracting, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Wetland 4 Outlet	----	----	----	----
					Client sampling date / time	[12-Jul-2022]	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B6060-001	-----	-----	-----	-----	-----
					Result	----	----	----	----	----
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B6060	Page	: 1 of 4
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 13-Jul-2022 16:15
PO	: ----	Issue Date	: 29-Jul-2022 11:04
C-O-C number	: ----		
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Bioassays : Survival/LC50 Daphnia Magna 48 hours										
LDPE carboy Wetland 4 Outlet	DAP-LC50-48	12-Jul-2022	----	----	----		14-Jul-2022	5 days	2 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

- No Quality Control data available for this section.



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Burnaby) - 8664 Commerce Court Burnaby British Columbia Canada V5A 4N7	Water	EPS1/RM/14	See attached report.

QUALITY CONTROL REPORT

Work Order	: VA22B6060	Page	: 1 of 2
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton EQ LC50	Date Samples Received	: 13-Jul-2022 16:15
PO	: ----	Date Analysis Commenced	: 14-Jul-2022
C-O-C number	: ----	Issue Date	: 29-Jul-2022 11:04
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.
 This Quality Control Report contains the following information:

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Trace Chometsky	Account Manager Assistant	Nautilus Environmental (Burnaby) External Subcontracting, Burnaby, British Columbia

Page : 2 of 2
Work Order : VA22B6060
Client : Regional District of Kitimat-Stikine
Project : Hazelton EQ LC50



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Acute Toxicity Test Results

Sample VA22B6060-001 Wetland 4 Outlet,
collected July 12, 2022

Final Report

July 28, 2022

Submitted to: **ALS Environmental**
Burnaby, BC

SAMPLE INFORMATION

Sample ID	Dates		<i>Daphnia magna</i> test initiation	Receipt temp.
	Collected	Received		
VA22B6060-001 Wetland 4 Outlet	12-Jul-22 at 0000h	14-Jul-22 at 0845h	14-Jul-22 at 1136h	12.7 - 13.1°C

TESTS

- *Daphnia magna* 48-h LC50 test

RESULTS

Toxicity test results

Sample ID	LC50 (% v/v)
VA22B6060-001 Wetland 4 Outlet	> 100

LC = Lethal Concentration

QA/QC

QA/QC summary	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	5.5 (4.4 – 6.9) g/L NaCl ¹
Reference toxicant historical mean (2 SD range)	5.1 (3.7 – 7.0) g/L NaCl
Reference toxicant CV	16%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

¹ Test date: July 19, 2022, LC = Lethal Concentration, SD = Standard Deviation, CL = Confidence Limits, CV = Coefficient of Variation



Report By:
Kiyeon Lee, B.Sc.
Laboratory Biologist



Reviewed By:
Stephanie Hans, M.Sc.
Project Biologist

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

APPENDIX A – Summary of test conditions

Table 3. Summary of test conditions: 48-h *Daphnia magna* LC50 test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24-hour old neonates
Test type	Static
Test duration	48 hours
Test vessel	250-mL glass beaker
Test volume	200 mL
Test solution depth	6 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Moderately-hard reconstituted water + 2.5 µg/L Se
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	None
Test measurements	Temperature, dissolved oxygen and pH measured daily; salinity, hardness and alkalinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/14, with 2016 amendments
Statistical software	CETIS Version 2.1.1
Test endpoints	Survival (48-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Sodium chloride (NaCl)

Daphnia magna Summary Sheet

Client: ALS Environmental
Work Order No.: 221425

Start Date/Time: July 17, 2022 @ 1136h
Test Species: Daphnia magna
Set up by: WV / BAM

Sample Information:

Sample ID: VAZZR 6060 - DOI Wetland 4 Outlet
Sample Date: July 12, 2022
Date Received: July 14, 2022
Sample Volume: 2X1L

Test Validity Criteria:
≥ 90% mean control survival and/or mobility and ≤ 2 daphnids exhibit immobility and/or mortality in any single control replicate.

WQ Ranges:
T (°C) = 20 ± 2; DO (mg/L) = 3.6 to 9.4; pH = 6 to 8.5

Test Organism Information:

Broodstock No.: 062222A
Age of young (Day 0): <24 h
Avg No. young per brood in previous 7 d: 40
Mortality (%) in previous 7 d: 0
Days to first brood: 7

NaCl Reference Toxicant Results:

Reference Toxicant ID: DmDC 104
Stock Solution ID: 22NaCl
Date Initiated: July 19, 2022
48-h LC50 (95% CL): 5.5 (4.4 - 6.9) g/L NaCl

Reference Toxicant Mean and Historical Range: 5.1 (3.7 - 7.0) g/L NaCl
Reference Toxicant CV (%): 16%

Test Results: The 48h LC50 is estimated to be >100% (v/v).

Reviewed by: SMH Date reviewed: July 28, 2022

Freshwater Acute 48 Hour Toxicity Test Data Sheet

Client: ALS Environmental
 Sample ID: VA22B 6060 - 001 Wetland 4 OWHet
 Work Order No.: 221425
 CER #: 5

Start Date/Time: July 14, 2022 @ 1136h
 Test Organism: D. magna
 # Organisms/volume: 10/200mL
 Set up by: WV / BAM

Thermometer: CERTS pH meter/probe: 6 / 6 DO meter/probe: 6 / 6 Cond./Salinity meter/probe: 6 / 6

Concentration % (v/v)	Number of Live Organisms Rep	Number of Live Organisms		No. Immobilized	Temperature (°C)			Dissolved oxygen (mg/L)			pH			Conductivity (µS/cm)	
		24	48		0	24	48	0	24	48	0	24	48	0	48
control	A	10	10	0	19.5	20.0	19.5	8.9	8.4	8.5	7.8	7.5	7.7	358	359
	B														
	C														
	D														
6.25	A	10	10	0	20.0	20.0	19.5	8.8	8.4	8.5	7.8	7.6	7.8	386	382
	B														
	C														
	D														
12.5	A	10	10	0	20.0	19.5	19.5	8.7	8.5	8.5	7.8	7.6	7.9	416	415
	B														
	C														
	D														
25	A	10	10	0	20.0	19.5	19.5	8.5	8.5	8.6	7.7	7.7	8.0	472	469
	B														
	C														
	D														
50	A	10	10	0	20.0	19.5	19.5	8.0	8.4	8.6	7.5	7.7	8.1	586	576
	B														
	C														
	D														
100	A	10	10	0	20.0	19.5	19.5	6.8	8.1	8.6	7.3	7.7	8.1	826	790
	B														
	C														
	D														
Technician Initials		KJ	GM	GM	KUL	KJ	GM	KUL	KJ	GM	KUL	KJ	GM	KUL	GM

Concentration	Hardness*	Alkalinity*
	*(mg/L as CaCO ₃)	
Control (MHW)	98	78
Highest conc.	300	240
Hardness adjusted	-	

	Initial WQ	Adjustment	Adjusted WQ
Temp (°C)	20.0		
DO (mg/L)	6.8		
pH	7.3		
Cond (µS/cm)	826		
Salinity (ppt)	0.4		

Sample Description: clear, yellow tinted liquid w/ no odor & no particulates
 Comments: _____ Mortality: Heartbeat checked under microscope N/A

Batch#: 062222A 7-d previous # young/brood: 40 Previous 7-d Mortality (%): 0 Day of 1st Brood: 7

Reviewed by: SMH Date reviewed: July 28, 2022

APPENDIX B – Chain-of-custody form



Chain of Custody
 Vancouver - Environmental
 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9

64197



Destination Lab: **Nautilus Environmental (Burnaby)**

Address: 8664 Commerce Court Burnaby BC
 Canada V5A 4N7

Work Order Number: **VA22B6060**

Original Receipt Date/Time: 13/07/2022 16:15
 Instructions Received

Relinquished By

Date/Time

Received By

Date/Time

Receipt Temp

Return as Indicated: Results: alsev.datasublet@alsglobal.com Invoice: alsev.datasublet@alsglobal.com Electronic Data: alsev.datasublet@alsglobal.com

Attention: Amber Springer

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA22B6060-001	Wetland 4 Outlet	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	04-08-2022	12/07/2022 00:00	2x1L
VA22B6060-001	Wetland 4 Outlet	Water	LDPE carboy			04-08-2022	12/07/2022 00:00	127-13.7°C

Jul 14/22
 @ 0845h
 Em

221425

END OF REPORT



CERTIFICATE OF ANALYSIS

Work Order : **VA22B6058**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 13-Jul-2022 16:15
Date Analysis Commenced : 15-Jul-2022
Issue Date : 28-Jul-2022 13:08

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Shantal Breeze	Laboratory Analyst	Organics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Treated Leachate to Phyto	SW-21	Travel Blank	Field Blank	----
Client sampling date / time					12-Jul-2022 11:47	12-Jul-2022 12:00	12-Jul-2022	12-Jul-2022 12:30	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B6058-001	VA22B6058-002	VA22B6058-003	VA22B6058-004	-----	
					Result	Result	Result	Result	----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	407	394	1.4	<1.0	----	
conductivity	----	E100	2.0	µS/cm	908	903	----	<2.0	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	324	330	<0.60	<0.60	----	
pH	----	E108	0.10	pH units	8.39	8.37	----	5.14	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	5.14	4.83	<0.0050	<0.0050	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.250 ^{DLDS}	<0.250 ^{DLDS}	<0.050	<0.050	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	66.9	67.1	<0.50	<0.50	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.100 ^{DLDS}	<0.020	<0.020	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	6.34	6.45	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.432	0.436	<0.0050	<0.0050	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0062	<0.0050 ^{DLDS}	<0.0010	<0.0010	----	
nitrogen, total	7727-37-9	E366	0.030	mg/L	6.63	6.68	<0.030	<0.030	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0045	0.0020	<0.0010	<0.0010	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2.59	2.81	<0.30	<0.30	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	16.0	17.2	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	16.9	17.7	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0348	0.0395	<0.0030	<0.0030	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00048	0.00046	<0.00010	<0.00010	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0234	0.0233	<0.00010	<0.00010	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.147	0.147	<0.00010	<0.00010	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000100 ^{DLA}	<0.000100 ^{DLA}	<0.000050	<0.000050	----	
boron, total	7440-42-8	E420	0.010	mg/L	0.551	0.525	<0.010	<0.010	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000221	0.0000184	<0.0000050	<0.0000050	----	
calcium, total	7440-70-2	E420	0.050	mg/L	92.7	95.6	<0.050	<0.050	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000022	<0.000020 ^{DLA}	<0.000010	<0.000010	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00079	0.00082	<0.00050	<0.00050	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Treated Leachate to Phyto	SW-21	Travel Blank	Field Blank	----
Client sampling date / time					12-Jul-2022 11:47	12-Jul-2022 12:00	12-Jul-2022	12-Jul-2022 12:30	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B6058-001	VA22B6058-002	VA22B6058-003	VA22B6058-004	-----	
					Result	Result	Result	Result	----	
Total Metals										
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00158	0.00157	<0.00010	<0.00010	----	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00100 ^{DLA}	<0.00100 ^{DLA}	<0.00050	<0.00050	----	
iron, total	7439-89-6	E420	0.010	mg/L	1.93	1.94	<0.010	<0.010	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000100 ^{DLA}	<0.000100 ^{DLA}	<0.000050	<0.000050	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0020 ^{DLA}	<0.0020 ^{DLA}	<0.0010	<0.0010	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	22.4	22.3	<0.0050	<0.0050	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	5.25	5.30	<0.00010	<0.00010	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00348	0.00306	<0.000050	<0.000050	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00562	0.00556	<0.00050	<0.00050	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.100 ^{DLA}	<0.100 ^{DLA}	<0.050	<0.050	----	
potassium, total	7440-09-7	E420	0.050	mg/L	15.2	15.5	<0.050	<0.050	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00160	0.00147	<0.00020	<0.00020	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000100 ^{DLA}	<0.000100 ^{DLA}	<0.000050	<0.000050	----	
silicon, total	7440-21-3	E420	0.10	mg/L	6.77	6.75	<0.10	<0.10	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000020 ^{DLA}	<0.000020 ^{DLA}	<0.000010	<0.000010	----	
sodium, total	7440-23-5	E420	0.050	mg/L	63.4	62.7	<0.050	<0.050	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.618	0.588	<0.00020	<0.00020	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	2.41	2.30	<0.50	<0.50	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00040 ^{DLA}	<0.00040 ^{DLA}	<0.00020	<0.00020	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000020 ^{DLA}	<0.000020 ^{DLA}	<0.000010	<0.000010	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00010	<0.00010	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00010	<0.00010	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00060 ^{DLA}	0.00062	<0.00030	<0.00030	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00020 ^{DLA}	<0.00020 ^{DLA}	<0.00010	<0.00010	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000492	0.000474	<0.000010	<0.000010	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00100 ^{DLA}	<0.00100 ^{DLA}	<0.00050	<0.00050	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0060 ^{DLA}	<0.0060 ^{DLA}	<0.0030	<0.0030	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00040 ^{DLA}	<0.00040 ^{DLA}	<0.00020	<0.00020	----	
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	4.0	4.3 ^{HTD}	----	<2.0	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Treated Leachate to Phyto	SW-21	Travel Blank	Field Blank	----
Client sampling date / time					12-Jul-2022 11:47	12-Jul-2022 12:00	12-Jul-2022	12-Jul-2022 12:30	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B6058-001	VA22B6058-002	VA22B6058-003	VA22B6058-004	-----	
					Result	Result	Result	Result	----	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	56	55	----	----	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	
toluene	108-88-3	E611A	0.50	µg/L	1.71	1.43	----	<0.50	----	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	<0.40	----	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	<0.30	----	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	101	90.4	----	91.7	----	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	99.6	98.9	----	97.1	----	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	<250	----	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	<100	----	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	----	<400	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	<250	----	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	----	<250	----	
VPHw	----	EC580A	100	µg/L	<100	<100	----	<100	----	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	77.1	79.2	----	78.0	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	118	106	----	105	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B6058	Page	: 1 of 19
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 13-Jul-2022 16:15
PO	: ----	Issue Date	: 28-Jul-2022 13:08
C-O-C number	: ----		
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Anions and Nutrients	QC-MRG7-5635750 01	----	nitrate (as N)	14797-55-8	E235.NO3-L	0.0103 ^B mg/L	0.005 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Field Blank	E550	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] SW-21	E550	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Aggregate Organics : Biochemical Oxygen Demand - 5 day											
HDPE [BOD HT 3d] Treated Leachate to Phyto	E550	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-21	E559-L	12-Jul-2022	----	----	----		22-Jul-2022	28 days	10 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) Treated Leachate to Phyto	E559-L	12-Jul-2022	----	----	----		22-Jul-2022	28 days	10 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Field Blank	E298	12-Jul-2022	19-Jul-2022	----	----		26-Jul-2022	28 days	14 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-21	E298	12-Jul-2022	19-Jul-2022	----	----		26-Jul-2022	28 days	14 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	12-Jul-2022	19-Jul-2022	----	----		26-Jul-2022	28 days	14 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Treated Leachate to Phyto	E298	12-Jul-2022	19-Jul-2022	----	----		26-Jul-2022	28 days	14 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Field Blank	E235.Br-L	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-21	E235.Br-L	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Travel Blank	E235.Br-L	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE Treated Leachate to Phyto	E235.Br-L	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Field Blank	E235.Cl	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-21	E235.Cl	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE Travel Blank	E235.Cl	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Chloride in Water by IC											
HDPE Treated Leachate to Phyto	E235.Cl	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE Field Blank	E378-U	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE SW-21	E378-U	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE Travel Blank	E378-U	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001											
HDPE Treated Leachate to Phyto	E378-U	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Field Blank	E235.F	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-21	E235.F	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Travel Blank	E235.F	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE Treated Leachate to Phyto	E235.F	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Field Blank	E235.NO3-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-21	E235.NO3-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Travel Blank	E235.NO3-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Treated Leachate to Phyto	E235.NO3-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Field Blank	E235.NO2-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-21	E235.NO2-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Travel Blank	E235.NO2-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Treated Leachate to Phyto	E235.NO2-L	12-Jul-2022	----	----	----		15-Jul-2022	3 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Field Blank	E235.SO4	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-21	E235.SO4	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Travel Blank	E235.SO4	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Treated Leachate to Phyto	E235.SO4	12-Jul-2022	----	----	----		15-Jul-2022	28 days	3 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-21	E318	12-Jul-2022	19-Jul-2022	----	----		27-Jul-2022	28 days	15 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Treated Leachate to Phyto	E318	12-Jul-2022	19-Jul-2022	----	----		27-Jul-2022	28 days	15 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Field Blank	E366	12-Jul-2022	19-Jul-2022	----	----		20-Jul-2022	28 days	8 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) SW-21	E366	12-Jul-2022	19-Jul-2022	----	----		20-Jul-2022	28 days	8 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Travel Blank	E366	12-Jul-2022	19-Jul-2022	----	----		20-Jul-2022	28 days	8 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Treated Leachate to Phyto	E366	12-Jul-2022	19-Jul-2022	----	----		20-Jul-2022	28 days	8 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	12-Jul-2022	25-Jul-2022	14 days	13 days	✓	25-Jul-2022	40 days	0 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-21	E601A	12-Jul-2022	25-Jul-2022	14 days	13 days	✓	25-Jul-2022	40 days	0 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Treated Leachate to Phyto	E601A	12-Jul-2022	25-Jul-2022	14 days	13 days	✓	25-Jul-2022	40 days	0 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-21	E581.VH+F1	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Treated Leachate to Phyto	E581.VH+F1	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-21	E358-L	12-Jul-2022	19-Jul-2022	----	----		19-Jul-2022	28 days	7 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Treated Leachate to Phyto	E358-L	12-Jul-2022	19-Jul-2022	----	----		19-Jul-2022	28 days	7 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-21	E355-L	12-Jul-2022	19-Jul-2022	----	----		19-Jul-2022	28 days	7 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Treated Leachate to Phyto	E355-L	12-Jul-2022	19-Jul-2022	----	----		19-Jul-2022	28 days	7 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Field Blank	E290	12-Jul-2022	----	----	----		16-Jul-2022	14 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-21	E290	12-Jul-2022	----	----	----		16-Jul-2022	14 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Travel Blank	E290	12-Jul-2022	----	----	----		16-Jul-2022	14 days	4 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Treated Leachate to Phyto	E290	12-Jul-2022	----	----	----		17-Jul-2022	14 days	5 days	✓	
Physical Tests : Conductivity in Water											
HDPE Field Blank	E100	12-Jul-2022	----	----	----		16-Jul-2022	28 days	4 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-21	E100	12-Jul-2022	----	----	----		16-Jul-2022	28 days	4 days	✓	
Physical Tests : Conductivity in Water											
HDPE Treated Leachate to Phyto	E100	12-Jul-2022	----	----	----		17-Jul-2022	28 days	5 days	✓	
Physical Tests : pH by Meter											
HDPE Treated Leachate to Phyto	E108	12-Jul-2022	----	----	----		17-Jul-2022	0.25 hrs	116 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Physical Tests : pH by Meter											
HDPE Field Blank	E108	12-Jul-2022	----	----	----		16-Jul-2022	0.25 hrs	93 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-21	E108	12-Jul-2022	----	----	----		16-Jul-2022	0.25 hrs	93 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	12-Jul-2022	----	----	----		21-Jul-2022	28 days	9 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-21	E508	12-Jul-2022	----	----	----		21-Jul-2022	28 days	9 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Travel Blank	E508	12-Jul-2022	----	----	----		21-Jul-2022	28 days	9 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Treated Leachate to Phyto	E508	12-Jul-2022	----	----	----		21-Jul-2022	28 days	9 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	12-Jul-2022	----	----	----		21-Jul-2022	180 days	9 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-21	E420	12-Jul-2022	----	----	----		21-Jul-2022	180 days	9 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Travel Blank	E420	12-Jul-2022	----	----	----		21-Jul-2022	180 days	9 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Treated Leachate to Phyto	E420	12-Jul-2022	----	----	----		21-Jul-2022	180 days	9 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Field Blank	E611A	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-21	E611A	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Treated Leachate to Phyto	E611A	12-Jul-2022	17-Jul-2022	----	----		17-Jul-2022	14 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	563574	2	29	6.9	5.0	✔
Ammonia by Fluorescence	E298	567987	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	563847	1	23	4.3	5.0	✖
Bromide in Water by IC (Low Level)	E235.Br-L	563580	2	19	10.5	5.0	✔
BTEX by Headspace GC-MS	E611A	566082	1	15	6.6	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	573533	1	5	20.0	5.0	✔
Chloride in Water by IC	E235.Cl	563576	2	30	6.6	5.0	✔
Conductivity in Water	E100	563573	2	30	6.6	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	567984	1	12	8.3	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	563584	2	27	7.4	5.0	✔
Fluoride in Water by IC	E235.F	563579	2	30	6.6	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	563577	2	30	6.6	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	563578	2	31	6.4	5.0	✔
pH by Meter	E108	563572	2	34	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	563575	2	30	6.6	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	567982	1	17	5.8	5.0	✔
Total Mercury in Water by CVAAS	E508	572119	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	568919	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	567986	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	567985	1	15	6.6	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	566084	1	3	33.3	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	563574	2	29	6.9	5.0	✔
Ammonia by Fluorescence	E298	567987	1	20	5.0	5.0	✔
BC PHCs - EPH by GC-FID	E601A	574944	1	15	6.6	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	563847	2	23	8.7	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	563580	2	19	10.5	5.0	✔
BTEX by Headspace GC-MS	E611A	566082	1	15	6.6	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	573533	1	5	20.0	5.0	✔
Chloride in Water by IC	E235.Cl	563576	2	30	6.6	5.0	✔
Conductivity in Water	E100	563573	2	30	6.6	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	567984	1	12	8.3	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	563584	2	27	7.4	5.0	✔
Fluoride in Water by IC	E235.F	563579	2	30	6.6	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	563577	2	30	6.6	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	563578	2	31	6.4	5.0	✔
pH by Meter	E108	563572	2	34	5.8	5.0	✔



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	563575	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	567982	1	17	5.8	5.0	✓
Total Mercury in Water by CVAAS	E508	572119	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	568919	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	567986	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	567985	1	15	6.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	566084	1	3	33.3	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	563574	2	29	6.9	5.0	✓
Ammonia by Fluorescence	E298	567987	1	20	5.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	574944	1	15	6.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	563847	2	23	8.7	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	563580	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	566082	1	15	6.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	573533	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	563576	2	30	6.6	5.0	✓
Conductivity in Water	E100	563573	2	30	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	567984	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	563584	2	27	7.4	5.0	✓
Fluoride in Water by IC	E235.F	563579	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	563577	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	563578	2	31	6.4	5.0	✓
Sulfate in Water by IC	E235.SO4	563575	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	567982	1	17	5.8	5.0	✓
Total Mercury in Water by CVAAS	E508	572119	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	568919	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	567986	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	567985	1	15	6.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	566084	1	3	33.3	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	567987	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	563580	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	566082	1	15	6.6	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	573533	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	563576	2	30	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	567984	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	563584	2	27	7.4	5.0	✓
Fluoride in Water by IC	E235.F	563579	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	563577	2	30	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	563578	2	31	6.4	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Sulfate in Water by IC	E235.SO4	563575	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	567982	1	17	5.8	5.0	✓
Total Mercury in Water by CVAAS	E508	572119	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	568919	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	567986	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	567985	1	15	6.6	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VH and F1 by Headspace GC-FID	E581.VH+F1 Calgary - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Calgary - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Calgary - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

Page : 19 of 19
Work Order : VA22B6058
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22B6058	Page	: 1 of 17
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 13-Jul-2022 16:15
PO	: ----	Date Analysis Commenced	: 15-Jul-2022
C-O-C number	: ----	Issue Date	: 28-Jul-2022 13:09
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Brianna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Shantal Breeze	Laboratory Analyst	Calgary Organics, Calgary, Alberta

Page : 2 of 17
Work Order : VA22B6058
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 563572)											
KS2202538-004	Anonymous	pH	----	E108	0.10	pH units	8.36	8.37	0.143%	4%	----
Physical Tests (QC Lot: 563573)											
KS2202538-004	Anonymous	conductivity	----	E100	2.0	µS/cm	375	375	0.00%	10%	----
Physical Tests (QC Lot: 563574)											
KS2202538-004	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	185	186	0.592%	20%	----
Physical Tests (QC Lot: 563925)											
FJ2201867-003	Anonymous	pH	----	E108	0.10	pH units	8.08	8.09	0.124%	4%	----
Physical Tests (QC Lot: 563926)											
FJ2201867-003	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	78.9	77.1	2.31%	20%	----
Physical Tests (QC Lot: 563927)											
FJ2201867-003	Anonymous	conductivity	----	E100	2.0	µS/cm	357	356	0.280%	10%	----
Anions and Nutrients (QC Lot: 563575)											
VA22B5899-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	57.2	57.4	0.195%	20%	----
Anions and Nutrients (QC Lot: 563576)											
VA22B5899-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	0.68	0.68	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563577)											
VA22B5899-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.175	0.175	0.118%	20%	----
Anions and Nutrients (QC Lot: 563578)											
VA22B5899-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0021	0.0021	0.00006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563579)											
VA22B5899-002	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.099	0.099	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563580)											
VA22B5899-002	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563584)											
VA22B5899-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563928)											
FJ2201867-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.068	0.066	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563929)											
FJ2201867-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563930)											
FJ2201867-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 563931)											
FJ2201867-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0526	0.0519	1.33%	20%	----
Anions and Nutrients (QC Lot: 563932)											
FJ2201867-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 563933)											
FJ2201867-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	25.9	25.9	0.0790%	20%	----
Anions and Nutrients (QC Lot: 563939)											
FJ2201867-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 567982)											
VA22B6058-001	Treated Leachate to Phyto	Kjeldahl nitrogen, total [TKN]	----	E318	0.250	mg/L	6.34	6.25	1.45%	20%	----
Anions and Nutrients (QC Lot: 567986)											
VA22B6058-001	Treated Leachate to Phyto	nitrogen, total	7727-37-9	E366	0.300	mg/L	6.63	6.70	0.994%	20%	----
Anions and Nutrients (QC Lot: 567987)											
VA22B6058-001	Treated Leachate to Phyto	ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	5.14	4.95	3.69%	20%	----
Organic / Inorganic Carbon (QC Lot: 567984)											
VA22B6058-001	Treated Leachate to Phyto	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	16.0	17.0	5.64%	20%	----
Organic / Inorganic Carbon (QC Lot: 567985)											
VA22B6058-001	Treated Leachate to Phyto	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	16.9	17.7	4.84%	20%	----
Total Metals (QC Lot: 568919)											
VA22B6036-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0078	0.0081	0.0002	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00032	0.00032	0.000002	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00212	0.00222	4.51%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0994	0.0998	0.393%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.035	0.035	0.0002	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000450	mg/L	<0.0000450	<0.0000450	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	156	160	2.64%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000144	0.000142	1.06%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00067	0.00068	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00377	0.00388	0.00011	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.147	0.148	0.914%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000085	0.000087	0.000002	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0152	0.0148	3.18%	20%	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	53.1	54.6	2.74%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 568919) - continued											
VA22B6036-001	Anonymous	manganese, total	7439-96-5	E420	0.00010	mg/L	0.0759	0.0763	0.565%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0616	0.0617	0.222%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00104	0.00104	0.0000010	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.300	mg/L	<0.300	<0.300	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	14.2	14.5	2.36%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00701	0.00744	5.97%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.00138	0.00144	4.58%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	6.63	6.68	0.878%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	71.0	70.5	0.669%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.42	1.42	0.343%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	204	207	1.36%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00025	0.00023	0.00002	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.00377	0.00388	2.64%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00138	0.00138	0.000001	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 572119)											
VA22B6044-002	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000061	0.0000060	0.0000001	Diff <2x LOR	----
Aggregate Organics (QC Lot: 563847)											
VA22B5877-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 573533)											
VA22B6018-007	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	56	60	4	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 566082)											
RG2200821-005	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	0.00312 mg/L	3.13	0.01	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----

Page : 6 of 17
 Work Order : VA22B6058
 Client : Regional District of Kitimat-Stikine
 Project : Hazelton WMF Treated Leachate at Wetland 4



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Volatile Organic Compounds (QC Lot: 566082) - continued											
RG2200821-005	Anonymous	xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 566084)											
VA22B6058-001	Treated Leachate to Phyto	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 563573)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 563574)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 563926)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 563927)						
conductivity	----	E100	1	µS/cm	1.2	----
Anions and Nutrients (QCLot: 563575)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 563576)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 563577)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	# 0.0103	B
Anions and Nutrients (QCLot: 563578)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 563579)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 563580)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 563584)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 563928)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 563929)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 563930)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 563931)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 563932)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 563933)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 563939)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 567982)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 567986)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	---
Anions and Nutrients (QCLot: 567987)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Organic / Inorganic Carbon (QCLot: 567984)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 567985)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 568919)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 568919) - continued						
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 572119)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 563847)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 570240)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 573533)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 566082)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 566084)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 574944)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----

Page : 10 of 17
Work Order : VA22B6058
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 574944) - continued						
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	---

Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 563572)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 563573)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.2	90.0	110	----
Physical Tests (QCLot: 563574)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Physical Tests (QCLot: 563925)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 563926)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Physical Tests (QCLot: 563927)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.5	90.0	110	----
Anions and Nutrients (QCLot: 563575)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 563576)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.9	90.0	110	----
Anions and Nutrients (QCLot: 563577)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 563578)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	96.2	90.0	110	----
Anions and Nutrients (QCLot: 563579)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 563580)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 563584)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.3	80.0	120	----
Anions and Nutrients (QCLot: 563928)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 563929)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.3	90.0	110	----
Anions and Nutrients (QCLot: 563930)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	98.2	85.0	115	----
Anions and Nutrients (QCLot: 563931)									



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Anions and Nutrients (QCLot: 563931) - continued									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 563932)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 563933)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 563939)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	100.0	80.0	120	----
Anions and Nutrients (QCLot: 567982)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.1	75.0	125	----
Anions and Nutrients (QCLot: 567986)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 567987)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Organic / Inorganic Carbon (QCLot: 567984)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.9	80.0	120	----
Organic / Inorganic Carbon (QCLot: 567985)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	109	80.0	120	----
Total Metals (QCLot: 568919)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	102	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	111	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	95.7	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	94.1	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	96.5	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	100.0	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.4	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.5	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.8	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	95.0	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	94.6	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				Qualifier
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		
						Low	High		
Total Metals (QCLot: 568919) - continued									
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.7	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	105	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	104	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	102	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	94.8	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	99.6	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	103	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	95.3	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	80.6	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.5	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.7	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	95.2	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	97.4	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	95.6	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Total Metals (QCLot: 572119)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Aggregate Organics (QCLot: 563847)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	99.1	85.0	115	----
Aggregate Organics (QCLot: 570240)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	88.2	85.0	115	----
Aggregate Organics (QCLot: 573533)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	110	85.0	115	----
Volatile Organic Compounds (QCLot: 566082)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	94.8	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	89.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	115	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	91.8	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 566082) - continued									
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	89.4	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	90.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	91.9	70.0	130	----
Hydrocarbons (QCLot: 566084)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	123	70.0	130	----
Hydrocarbons (QCLot: 574944)									
EPH (C10-C19)	----	E601A	250	µg/L	6638.596 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3614.035 µg/L	111	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	10238.59 µg/L	105	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 563575)										
KS2202538-003	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 563576)										
KS2202538-003	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 563577)										
KS2202514-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	12.1 mg/L	12.5 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 563578)										
KS2202538-003	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.486 mg/L	0.5 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 563579)										
KS2202538-003	Anonymous	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 563580)										
VA22B5899-003	Anonymous	bromide	24959-67-9	E235.Br-L	0.533 mg/L	0.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 563584)										
VA22B5899-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0320 mg/L	0.03 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 563928)										
FJ2201867-002	Anonymous	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 563929)										
FJ2201867-002	Anonymous	chloride	16887-00-6	E235.Cl	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 563930)										
FJ2201867-002	Anonymous	bromide	24959-67-9	E235.Br-L	0.508 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 563931)										
FJ2201867-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.61 mg/L	2.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 563932)										
FJ2201867-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 563933)										
FJ2201867-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 563939)										
FJ2201867-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0345 mg/L	0.03 mg/L	115	70.0	130	----
Anions and Nutrients (QCLot: 567982)										



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 567982) - continued										
VA22B6058-002	SW-21	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 567986)										
VA22B6058-002	SW-21	nitrogen, total	7727-37-9	E366	ND mg/L	4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 567987)										
VA22B6058-002	SW-21	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 567984)										
VA22B6058-002	SW-21	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 567985)										
VA22B6058-002	SW-21	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 568919)										
VA22B6036-002	Anonymous	aluminum, total	7429-90-5	E420	0.198 mg/L	0.2 mg/L	99.3	70.0	130	----
		antimony, total	7440-36-0	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0357 mg/L	0.04 mg/L	89.2	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		boron, total	7440-42-8	E420	0.088 mg/L	0.1 mg/L	88.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.4	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00969 mg/L	0.01 mg/L	96.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130	----
		iron, total	7439-89-6	E420	1.91 mg/L	2 mg/L	95.6	70.0	130	----
		lead, total	7439-92-1	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.0376 mg/L	0.04 mg/L	94.1	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.2 mg/L	10 mg/L	102	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		selenium, total	7782-49-2	E420	0.0425 mg/L	0.04 mg/L	106	70.0	130	----
		silicon, total	7440-21-3	E420	8.94 mg/L	10 mg/L	89.4	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 568919) - continued										
VA22B6036-002	Anonymous	silver, total	7440-22-4	E420	0.00383 mg/L	0.004 mg/L	95.8	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0389 mg/L	0.04 mg/L	97.3	70.0	130	----
		thallium, total	7440-28-0	E420	0.00380 mg/L	0.004 mg/L	95.0	70.0	130	----
		thorium, total	7440-29-1	E420	0.0219 mg/L	0.02 mg/L	109	70.0	130	----
		tin, total	7440-31-5	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		titanium, total	7440-32-6	E420	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		uranium, total	7440-61-1	E420	0.00419 mg/L	0.004 mg/L	105	70.0	130	----
		vanadium, total	7440-62-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, total	7440-66-6	E420	0.385 mg/L	0.4 mg/L	96.4	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0439 mg/L	0.04 mg/L	110	70.0	130	----
Total Metals (QCLot: 572119)										
VA22B6046-001	Anonymous	mercury, total	7439-97-6	E508	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Aggregate Organics (QCLot: 573533)										
VA22B6058-001	Treated Leachate to Phyto	chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----
Volatile Organic Compounds (QCLot: 566082)										
RG2200821-005	Anonymous	benzene	71-43-2	E611A	95.0 µg/L	100 µg/L	95.0	70.0	130	----
		ethylbenzene	100-41-4	E611A	85.4 µg/L	100 µg/L	85.4	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	102 µg/L	100 µg/L	102	70.0	130	----
		styrene	100-42-5	E611A	90.8 µg/L	100 µg/L	90.8	70.0	130	----
		toluene	108-88-3	E611A	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	179 µg/L	200 µg/L	89.7	70.0	130	----
		xylene, o-	95-47-6	E611A	89.4 µg/L	100 µg/L	89.4	70.0	130	----



CERTIFICATE OF ANALYSIS

Work Order : **VA22B1224**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Surface Water
PO : ----
C-O-C number : ----
Sampler : Hannah Shinton
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 9
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 20-May-2022 21:35
Date Analysis Commenced : 24-May-2022
Issue Date : 14-Jun-2022 14:01

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Parnian Sane	Analyt	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTMF	Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-05	SW-21	SW-01	SW-02	Field Blank
(Matrix: Water)										
Client sampling date / time					17-May-2022 15:15	17-May-2022 12:00	17-May-2022 09:54	17-May-2022 11:28	17-May-2022 16:06	
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-001	VA22B1224-002	VA22B1224-003	VA22B1224-004	VA22B1224-005	
					Result	Result	Result	Result	Result	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	18.4	18.6	22.9	57.0	----	
conductivity	----	E100	2.0	µS/cm	128	129	44.5	107	<2.0	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	33.6	34.0	20.3	50.9	<0.60	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	34.4	34.2	24.1	51.1	<0.60	
pH	----	E108	0.10	pH units	7.30	7.30	7.44	7.83	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0091	0.0080	<0.0050	<0.0050	<0.0050	
chloride	16887-00-6	E235.Cl	0.50	mg/L	25.0	24.9	<0.50	<0.50	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.034	0.034	0.032	0.056	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.658	0.750	0.382	0.359	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	<0.0051	<0.0051	<0.0051	<0.0051	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.750	0.738	1.58	0.426	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	<0.30	<0.30	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	24.8	25.8	14.6	12.1	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	25.0	26.6	15.1	12.0	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.170	0.170	0.137	0.0991	0.0400 ^{RRV}	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00063	0.00056	0.00041	0.00045	<0.00010	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0116	0.0115	0.0119	0.0122	0.00040 ^{RRV}	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000097	0.0000064	0.0000147	0.0000108	<0.0000050	
calcium, total	7440-70-2	E420	0.050	mg/L	10.2	10.1	6.52	14.2	<0.050	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-01	SW-02	Field Blank
Client sampling date / time					17-May-2022 15:15	17-May-2022 12:00	17-May-2022 09:54	17-May-2022 11:28	17-May-2022 16:06	
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-001	VA22B1224-002	VA22B1224-003	VA22B1224-004	VA22B1224-005	
					Result	Result	Result	Result	Result	
Total Metals										
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00015	0.00015	0.00016	<0.00010	<0.00010	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00103	0.00103	0.00090	0.00080	<0.00050	
iron, total	7439-89-6	E420	0.010	mg/L	0.386	0.384	0.712	0.201	0.067 ^{RRV}	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
magnesium, total	7439-95-4	E420	0.0050	mg/L	2.18	2.17	1.89	3.79	0.0152 ^{RRV}	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.0319	0.0290	0.0190	0.00736	0.00148 ^{RRV}	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0.000054	0.000058	<0.000050	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00082	0.00080	0.00071	<0.00050	<0.00050	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0.072	<0.050	<0.050	
potassium, total	7440-09-7	E420	0.050	mg/L	0.339	0.330	0.872	0.542	<0.050	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00028	0.00026	0.00076	0.00025	<0.00020	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000070	0.000070	0.000071	0.000079	<0.000050	
silicon, total	7440-21-3	E420	0.10	mg/L	0.71	0.73	2.07	4.22	<0.10	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, total	7440-23-5	E420	0.050	mg/L	13.1	13.0	1.54	2.79	<0.050	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0653	0.0645	0.0433	0.0822	<0.00020	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00112	0.00104	0.00143	0.00140	<0.00150 ^{DLM, RRV}	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0.00057	<0.00050	<0.00050	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0052	0.0053	<0.0030	<0.0030	<0.0030	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00027	0.00026	0.00024	<0.00020	<0.00020	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.157	0.170	0.104	0.0750	<0.0010	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-01	SW-02	Field Blank
Client sampling date / time					17-May-2022 15:15	17-May-2022 12:00	17-May-2022 09:54	17-May-2022 11:28	17-May-2022 16:06	
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-001	VA22B1224-002	VA22B1224-003	VA22B1224-004	VA22B1224-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00058	0.00052	0.00036	0.00042	<0.00010	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0127	0.0125	0.00988	0.0125	<0.00010	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000186	0.0000389 ^{DTMF}	0.0000252 ^{DTMF}	0.0000078	<0.0000050	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	9.73	9.83	5.55	14.1	<0.050	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00014	0.00012	0.00016	0.00010	<0.00010	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00104	0.00111	0.00122	0.00071	<0.00020	
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.348	0.349	0.214	0.181	<0.010	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.27	2.29	1.56	3.81	<0.0050	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0252	0.0256	0.0189	0.0113 ^{DTMF}	<0.00010	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00115	0.00100	0.00077	<0.00050	<0.00050	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.355	0.366	0.739	0.570	<0.050	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00028	0.00027	0.00062	0.00028	<0.00020	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000078	0.000072	0.000064	0.000067	<0.000050	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.628	0.640	2.48	3.77	<0.050	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	14.5	14.4	1.55	2.95	<0.050	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0686	0.0673	0.0392	0.0801	<0.00020	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-01	SW-02	Field Blank
Client sampling date / time					17-May-2022 15:15	17-May-2022 12:00	17-May-2022 09:54	17-May-2022 11:28	17-May-2022 16:06	
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-001	VA22B1224-002	VA22B1224-003	VA22B1224-004	VA22B1224-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00092	0.00104	0.00063	0.00108	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	0.000016	<0.000010	0.000011	<0.000010	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0064	0.0064	0.0027	0.0025	<0.0010	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00030	0.00033	0.00027	0.00021	<0.00020	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	68	74	32	28	----	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	92.4	96.3	91.9	93.5	92.6	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	101	100	101	101	102	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	<100	<100	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	<400	<400	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	<100	<100	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-01	SW-02	Field Blank
Client sampling date / time					17-May-2022 15:15	17-May-2022 12:00	17-May-2022 09:54	17-May-2022 11:28	17-May-2022 16:06	
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-001	VA22B1224-002	VA22B1224-003	VA22B1224-004	VA22B1224-005	
					Result	Result	Result	Result	Result	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	102	101	108	96.6	99.5	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	90.9	106	96.6	106	91.2	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	----	----	----	----
					Client sampling date / time	17-May-2022	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-006	-----	-----	-----	-----	
					Result	----	----	----	----	
Physical Tests										
conductivity	----	E100	2.0	µS/cm	<2.0	----	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	<0.60	----	----	----	----	
pH	----	E108	0.10	pH units	5.32	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	----	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	----	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	----	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	----	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	----	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	----	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	----	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	----	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	----	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	----	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	----	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	----	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	----	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	----	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	----	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	----	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	----	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	----	----	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	----	----	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	----	----	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	----	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	----	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	----	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	----	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	----	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	----	----	----	----
					Client sampling date / time	17-May-2022	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B1224-006	-----	-----	-----	-----	-----
					Result	----	----	----	----	----
Total Metals										
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	----	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	----	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	----	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	----	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	----	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	----	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	----	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	----	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B1224	Page	: 1 of 21
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Surface Water	Date Samples Received	: 20-May-2022 21:35
PO	: ----	Issue Date	: 14-Jun-2022 14:01
C-O-C number	: ----		
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-01	E559-L	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-02	E559-L	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-05	E559-L	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-21	E559-L	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Field Blank	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW-01	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW-02	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-05	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-21	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-01	E235.Cl	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-02	E235.Cl	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-05	E235.Cl	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-21	E235.Cl	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-01	E235.F	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-02	E235.F	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-05	E235.F	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-21	E235.F	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Field Blank	E235.NO3-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-01	E235.NO3-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-02	E235.NO3-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-05	E235.NO3-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-21	E235.NO3-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE Field Blank	E235.NO2-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-01	E235.NO2-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	* EHTR	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-02	E235.NO2-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	*	EHTR
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-05	E235.NO2-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	*	EHTR
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-21	E235.NO2-L	17-May-2022	----	----	----		01-Jun-2022	3 days	15 days	*	EHTR
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-01	E235.SO4	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-02	E235.SO4	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-05	E235.SO4	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-21	E235.SO4	17-May-2022	----	----	----		01-Jun-2022	28 days	15 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-01	E318	17-May-2022	07-Jun-2022	----	----		10-Jun-2022	28 days	24 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-02	E318	17-May-2022	07-Jun-2022	----	----		10-Jun-2022	28 days	24 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-05	E318	17-May-2022	07-Jun-2022	----	----		10-Jun-2022	28 days	24 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-21	E318	17-May-2022	07-Jun-2022	----	----		10-Jun-2022	28 days	24 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) SW-01	E366	17-May-2022	07-Jun-2022	----	----		08-Jun-2022	28 days	22 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) SW-02	E366	17-May-2022	07-Jun-2022	----	----		08-Jun-2022	28 days	22 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) SW-05	E366	17-May-2022	07-Jun-2022	----	----		08-Jun-2022	28 days	22 days	✔	
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) SW-21	E366	17-May-2022	07-Jun-2022	----	----		08-Jun-2022	28 days	22 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-05	E509	17-May-2022	24-May-2022	----	----		24-May-2022	28 days	7 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-21	E509	17-May-2022	24-May-2022	----	----		24-May-2022	28 days	7 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) Field Blank	E509	17-May-2022	26-May-2022	----	----		26-May-2022	28 days	9 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-01	E509	17-May-2022	26-May-2022	----	----		26-May-2022	28 days	9 days	✓	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-02	E509	17-May-2022	26-May-2022	----	----		26-May-2022	28 days	9 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) Field Blank	E421	17-May-2022	04-Jun-2022	----	----		05-Jun-2022	180 days	19 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-01	E421	17-May-2022	04-Jun-2022	----	----		05-Jun-2022	180 days	19 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-02	E421	17-May-2022	04-Jun-2022	----	----		05-Jun-2022	180 days	19 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-05	E421	17-May-2022	04-Jun-2022	----	----		05-Jun-2022	180 days	19 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-21	E421	17-May-2022	04-Jun-2022	----	----		05-Jun-2022	180 days	19 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	17-May-2022	31-May-2022	14 days	14 days	✓	01-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-01	E601A	17-May-2022	31-May-2022	14 days	14 days	✓	01-Jun-2022	40 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-02	E601A	17-May-2022	31-May-2022	14 days	14 days	✓	01-Jun-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-05	E601A	17-May-2022	31-May-2022	14 days	14 days	✓	01-Jun-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-21	E601A	17-May-2022	31-May-2022	14 days	14 days	✓	01-Jun-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-01	E581.VH+F1	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-02	E581.VH+F1	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-05	E581.VH+F1	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-21	E581.VH+F1	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SW-01	E358-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-02	E358-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-05	E358-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-21	E358-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-01	E355-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-02	E355-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-05	E355-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-21	E355-L	17-May-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	21 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-01	E290	17-May-2022	----	----	----		03-Jun-2022	14 days	17 days	* EHT	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-02	E290	17-May-2022	----	----	----		03-Jun-2022	14 days	17 days	* EHT	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE SW-05	E290	17-May-2022	----	----	----		03-Jun-2022	14 days	17 days	* EHT
Physical Tests : Alkalinity Species by Titration										
HDPE SW-21	E290	17-May-2022	----	----	----		03-Jun-2022	14 days	17 days	* EHT
Physical Tests : Conductivity in Water										
HDPE Field Blank	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-01	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-02	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-05	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-21	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	17-May-2022	----	----	----		03-Jun-2022	28 days	17 days	✓
Physical Tests : pH by Meter										
HDPE SW-05	E108	17-May-2022	----	----	----		03-Jun-2022	0.25 hrs	406 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE Travel Blank	E108	17-May-2022	----	----	----		03-Jun-2022	0.25 hrs	406 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-21	E108	17-May-2022	----	----	----		03-Jun-2022	0.25 hrs	409 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-02	E108	17-May-2022	----	----	----		03-Jun-2022	0.25 hrs	410 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-01	E108	17-May-2022	----	----	----		03-Jun-2022	0.25 hrs	411 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-01	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-02	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-05	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-21	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Travel Blank	E508	17-May-2022	----	----	----		25-May-2022	28 days	8 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-01	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-02	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-05	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-21	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Travel Blank	E420	17-May-2022	----	----	----		04-Jun-2022	180 days	18 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Field Blank	E611A	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-01	E611A	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-02	E611A	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-05	E611A	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-21	E611A	17-May-2022	29-May-2022	----	----		29-May-2022	14 days	12 days	✓

Legend & Qualifier Definitions

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	506174	1	12	8.3	5.0	✔
Ammonia by Fluorescence	E298	514167	1	12	8.3	5.0	✔
BTEX by Headspace GC-MS	E611A	503398	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	507209	2	34	5.8	5.0	✔
Chloride in Water by IC	E235.Cl	506166	1	16	6.2	5.0	✔
Conductivity in Water	E100	506173	1	14	7.1	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	497354	2	38	5.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	511037	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	514164	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	506168	1	4	25.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	506170	1	5	20.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	506171	1	5	20.0	5.0	✔
pH by Meter	E108	506172	1	13	7.6	5.0	✔
Sulfate in Water by IC	E235.SO4	506167	1	12	8.3	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	514163	1	4	25.0	5.0	✔
Total Mercury in Water by CVAAS	E508	498988	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	509817	1	16	6.2	5.0	✔
Total Nitrogen by Colourimetry	E366	514166	1	7	14.2	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	514165	1	7	14.2	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	503399	1	15	6.6	5.0	✔
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	506174	1	12	8.3	5.0	✔
Ammonia by Fluorescence	E298	514167	1	12	8.3	5.0	✔
BC PHCs - EPH by GC-FID	E601A	505045	1	17	5.8	5.0	✔
BTEX by Headspace GC-MS	E611A	503398	1	20	5.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	507209	2	34	5.8	5.0	✔
Chloride in Water by IC	E235.Cl	506166	1	16	6.2	5.0	✔
Conductivity in Water	E100	506173	1	14	7.1	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	497354	2	38	5.2	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	511037	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	514164	1	7	14.2	5.0	✔
Fluoride in Water by IC	E235.F	506168	1	4	25.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	506170	1	5	20.0	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	506171	1	5	20.0	5.0	✔
pH by Meter	E108	506172	1	13	7.6	5.0	✔
Sulfate in Water by IC	E235.SO4	506167	1	12	8.3	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	514163	1	4	25.0	5.0	✔



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Mercury in Water by CVAAS	E508	498988	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	509817	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	514166	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	514165	1	7	14.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	503399	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	506174	1	12	8.3	5.0	✓
Ammonia by Fluorescence	E298	514167	1	12	8.3	5.0	✓
BC PHCs - EPH by GC-FID	E601A	505045	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	503398	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	507209	2	34	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	506166	1	16	6.2	5.0	✓
Conductivity in Water	E100	506173	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	497354	2	38	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	511037	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	514164	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	506168	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	506170	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	506171	1	5	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	506167	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	514163	1	4	25.0	5.0	✓
Total Mercury in Water by CVAAS	E508	498988	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	509817	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	514166	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	514165	1	7	14.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	503399	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	514167	1	12	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	503398	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	507209	2	34	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	506166	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	497354	2	38	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	511037	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	514164	1	7	14.2	5.0	✓
Fluoride in Water by IC	E235.F	506168	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	506170	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	506171	1	5	20.0	5.0	✓
Sulfate in Water by IC	E235.SO4	506167	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	514163	1	4	25.0	5.0	✓
Total Mercury in Water by CVAAS	E508	498988	1	20	5.0	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Total Metals in Water by CRC ICPMS	E420	509817	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	514166	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	514165	1	7	14.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	503399	1	15	6.6	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Vancouver - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22B1224	Page	: 1 of 18
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Surface Water	Date Samples Received	: 20-May-2022 21:35
PO	: ----	Date Analysis Commenced	: 24-May-2022
C-O-C number	: ----	Issue Date	: 14-Jun-2022 14:01
Sampler	: Hannah Shinton		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Christopher Li	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Dee Lee	Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

Page : 2 of 18
Work Order : VA22B1224
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 506172)											
VA22B1045-003	Anonymous	pH	----	E108	0.10	pH units	4.02	4.01	0.002	Diff <2x LOR	----
Physical Tests (QC Lot: 506173)											
VA22B1045-003	Anonymous	conductivity	----	E100	2.0	µS/cm	63.5	65.9	3.71%	10%	----
Physical Tests (QC Lot: 506174)											
VA22B1045-003	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 506166)											
VA22B1224-001	SW-05	chloride	16887-00-6	E235.Cl	0.50	mg/L	25.0	24.9	0.273%	20%	----
Anions and Nutrients (QC Lot: 506167)											
VA22B1224-001	SW-05	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 506168)											
VA22B1224-001	SW-05	fluoride	16984-48-8	E235.F	0.020	mg/L	0.034	0.035	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 506170)											
VA22B1224-001	SW-05	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 506171)											
VA22B1224-001	SW-05	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 514163)											
VA22B1224-001	SW-05	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.658	0.660	0.357%	20%	----
Anions and Nutrients (QC Lot: 514166)											
VA22B1224-001	SW-05	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.750	0.773	2.92%	20%	----
Anions and Nutrients (QC Lot: 514167)											
FJ2201342-009	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0055	0.0052	0.0003	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 514164)											
VA22B1224-001	SW-05	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	24.8	25.7	3.32%	20%	----
Organic / Inorganic Carbon (QC Lot: 514165)											
VA22B1224-001	SW-05	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	25.0	26.5	5.73%	20%	----
Total Metals (QC Lot: 498988)											
VA22B1224-001	SW-05	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 509817)											
KS2201742-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0066	0.0076	0.0010	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00032	0.00032	0.000006	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00182	0.00178	2.52%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 509817) - continued											
KS2201742-001	Anonymous	barium, total	7440-39-3	E420	0.00010	mg/L	0.0107	0.0109	1.86%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.060	0.061	0.0003	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	21.3	21.9	2.50%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000050	0.000047	0.000003	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	0.00060	0.00061	0.000010	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	14.5	14.4	0.686%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0105	0.0104	0.616%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000670	0.000657	1.94%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00392	0.00389	0.00004	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	1.16	1.18	2.10%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00056	0.00056	0.000002	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000224	0.000210	0.000014	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	6.13	6.10	0.444%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	3.04	3.11	2.40%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0640	0.0628	1.91%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	3.40	3.40	0.004	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000018	0.000017	0.000001	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 509817) - continued											
KS2201742-001	Anonymous	zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 497354)											
CG2206053-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 500572)											
VA22B1124-002	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 511037)											
VA22B1085-006	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0222	0.0241	8.39%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00049	0.00052	0.00003	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00729	0.00758	3.80%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	16.1	16.2	0.128%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00043	0.00046	0.00003	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.074	0.074	0.00006	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	3.69	3.81	3.29%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00864	0.00916	5.80%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000549	0.000568	3.52%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.100	mg/L	0.830	0.851	0.021	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00043	0.00043	0.000002	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	0.000060	0.000010	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.90	4.82	1.72%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.96	3.03	2.40%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0825	0.0859	4.00%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1.23	1.18	0.05	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 511037) - continued											
VA22B1085-006	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00057	0.00061	0.00004	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000088	0.000090	0.000002	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 507209)											
FJ2201351-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 507210)											
VA22B1224-002	SW-21	chemical oxygen demand [COD]	----	E559-L	10	mg/L	74	74	0.1	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 503398)											
FJ2201210-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 503399)											
VA22B0726-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<0.10 mg/L	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 506173)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 506174)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 506166)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 506167)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 506168)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 506170)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 506171)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 514163)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 514166)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 514167)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 514164)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 514165)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 498988)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 509817)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 509817) - continued						
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
Dissolved Metals (QCLot: 497354)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
Dissolved Metals (QCLot: 500572)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 511037)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 511037) - continued						
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---
Aggregate Organics (QCLot: 507209)						
chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	---
Aggregate Organics (QCLot: 507210)						
chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	---
Volatile Organic Compounds (QCLot: 503398)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	---
styrene	100-42-5	E611A	0.5	µg/L	<0.50	---
toluene	108-88-3	E611A	0.5	µg/L	<0.50	---
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	---
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	---
Hydrocarbons (QCLot: 503399)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	---
Hydrocarbons (QCLot: 505045)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	---



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 506172)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 506173)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.9	90.0	110	----
Physical Tests (QCLot: 506174)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 506166)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 506167)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 506168)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 506170)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 506171)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 514163)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	91.0	75.0	125	----
Anions and Nutrients (QCLot: 514166)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 514167)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Organic / Inorganic Carbon (QCLot: 514164)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	116	80.0	120	----
Organic / Inorganic Carbon (QCLot: 514165)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 498988)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Total Metals (QCLot: 509817)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	109	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	107	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	109	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QLot: 509817) - continued									
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	107	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.5	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	106	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	112	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	108	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	96.1	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.1	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	106	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	97.8	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	108	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	108	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	104	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 500572) - continued									
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 511037)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	104	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.1	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	92.8	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.7	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.3	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.2	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.0	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	112	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	93.4	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	100.0	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.0	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	93.3	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	104	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	96.8	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
						Low	High		
Dissolved Metals (QCLot: 511037) - continued									
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	105	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
Aggregate Organics (QCLot: 507209)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	112	85.0	115	----
Aggregate Organics (QCLot: 507210)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	112	85.0	115	----
Volatile Organic Compounds (QCLot: 503398)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	95.2	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	97.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	99.8	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	99.0	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	89.0	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	99.0	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	97.9	70.0	130	----
Hydrocarbons (QCLot: 503399)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	90.6	70.0	130	----
Hydrocarbons (QCLot: 505045)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	104	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	110	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	106	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 506166)										
VA22B1224-002	SW-21	chloride	16887-00-6	E235.Cl	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 506167)										
VA22B1224-002	SW-21	sulfate (as SO4)	14808-79-8	E235.SO4	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 506168)										
VA22B1224-002	SW-21	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 506170)										
VA22B1224-002	SW-21	nitrate (as N)	14797-55-8	E235.NO3-L	2.62 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 506171)										
VA22B1224-002	SW-21	nitrite (as N)	14797-65-0	E235.NO2-L	0.509 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 514163)										
VA22B1224-002	SW-21	Kjeldahl nitrogen, total [TKN]	----	E318	2.63 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 514166)										
VA22B1224-002	SW-21	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 514167)										
FJ2201342-010	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Organic / Inorganic Carbon (QCLot: 514164)										
VA22B1224-002	SW-21	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 514165)										
VA22B1224-002	SW-21	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 498988)										
VA22B1224-002	SW-21	mercury, total	7439-97-6	E508	0.0000904 mg/L	0.0001 mg/L	90.4	70.0	130	----
Total Metals (QCLot: 509817)										
KS2201742-002	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0406 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00988 mg/L	0.01 mg/L	98.8	70.0	130	----
		boron, total	7440-42-8	E420	0.093 mg/L	0.1 mg/L	93.4	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 509817) - continued										
KS2201742-002	Anonymous	cadmium, total	7440-43-9	E420	0.00386 mg/L	0.004 mg/L	96.4	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		chromium, total	7440-47-3	E420	0.0389 mg/L	0.04 mg/L	97.3	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		copper, total	7440-50-8	E420	0.0182 mg/L	0.02 mg/L	91.0	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, total	7440-02-0	E420	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.95 mg/L	10 mg/L	99.5	70.0	130	----
		potassium, total	7440-09-7	E420	3.34 mg/L	4 mg/L	83.5	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		selenium, total	7782-49-2	E420	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	20.0 mg/L	20 mg/L	99.9	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		thallium, total	7440-28-0	E420	0.00373 mg/L	0.004 mg/L	93.3	70.0	130	----
		thorium, total	7440-29-1	E420	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		tin, total	7440-31-5	E420	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		titanium, total	7440-32-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		uranium, total	7440-61-1	E420	0.00394 mg/L	0.004 mg/L	98.5	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0986 mg/L	0.1 mg/L	98.6	70.0	130	----
		zinc, total	7440-66-6	E420	0.384 mg/L	0.4 mg/L	96.0	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 497354)										
CG2206055-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000936 mg/L	0.0001 mg/L	93.6	70.0	130	----
Dissolved Metals (QCLot: 500572)										
VA22B1124-003	Anonymous	mercury, dissolved	7439-97-6	E509	0.000977 mg/L	0.001 mg/L	97.7	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 511037)										
VA22B1085-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.198 mg/L	0.2 mg/L	98.9	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00984 mg/L	0.01 mg/L	98.4	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.094 mg/L	0.1 mg/L	94.5	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	98.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0205 mg/L	0.02 mg/L	103	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0953 mg/L	0.1 mg/L	95.3	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0426 mg/L	0.04 mg/L	106	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.0 mg/L	10 mg/L	110	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.07 mg/L	4 mg/L	102	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0420 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.54 mg/L	10 mg/L	95.4	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00419 mg/L	0.004 mg/L	105	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	20.1 mg/L	20 mg/L	100	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0196 mg/L	0.02 mg/L	98.3	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00410 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Dissolved Metals (QCLot: 511037) - continued										
VA22B1085-007	Anonymous	zinc, dissolved	7440-66-6	E421	0.406 mg/L	0.4 mg/L	102	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
Aggregate Organics (QCLot: 507209)										
FJ2201351-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----
Aggregate Organics (QCLot: 507210)										
VA22B1224-003	SW-01	chemical oxygen demand [COD]	----	E559-L	115 mg/L	100 mg/L	115	75.0	125	----
Volatile Organic Compounds (QCLot: 503398)										
VA22B0601-001	Anonymous	benzene	71-43-2	E611A	94.6 µg/L	100 µg/L	94.6	70.0	130	----
		ethylbenzene	100-41-4	E611A	95.7 µg/L	100 µg/L	95.7	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	100 µg/L	100 µg/L	100	70.0	130	----
		styrene	100-42-5	E611A	100 µg/L	100 µg/L	100	70.0	130	----
		toluene	108-88-3	E611A	86.1 µg/L	100 µg/L	86.1	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	196 µg/L	200 µg/L	97.8	70.0	130	----
		xylene, o-	95-47-6	E611A	97.7 µg/L	100 µg/L	97.7	70.0	130	----
Hydrocarbons (QCLot: 503399)										
VA22B0782-003	Anonymous	VHw (C6-C10)	----	E581.VH+F1	4560 µg/L	6310 µg/L	72.3	60.0	140	----



Chain of Custody (COC) / Analytical Request Form


Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4546 Hazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nlavioie@rdks.bc.ca Email 3: eblaney@rdks.bc.ca		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply) <input type="checkbox"/>																																																																																																																																																																																																																																																													
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca, hshinton@rdks.bc.ca Email 2:		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <thead> <tr> <th></th> <th>P</th> <th>F/P</th> <th>F/P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>Total Metals</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Dissolved Metals</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Alkalinity</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Dissolved Organic Carbon</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Chloride, Fluoride, sulphate, hardness</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Ammonia</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Nitrate, Nitrite</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Nitrate + Nitrite, Total Nitrogen</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Total Kjeldahl Nitrogen</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>TOC</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>pH</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>COD</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>Conductivity</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>EPH</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>BTEX / VPH</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> </tr> <tr> <td>SAMPLES ON HOLD</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NUMBER OF CONTAINERS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			P	F/P	F/P	P	P	P	P	P	P	P	P			Total Metals	R	R	R	R	R	R	R	R	R	R	R	R	R	Dissolved Metals	R	R	R	R	R	R	R	R	R	R	R	R	R	Alkalinity	R	R	R	R	R	R	R	R	R	R	R	R	R	Dissolved Organic Carbon	R	R	R	R	R	R	R	R	R	R	R	R	R	Chloride, Fluoride, sulphate, hardness	R	R	R	R	R	R	R	R	R	R	R	R	R	Ammonia	R	R	R	R	R	R	R	R	R	R	R	R	R	Nitrate, Nitrite	R	R	R	R	R	R	R	R	R	R	R	R	R	Nitrate + Nitrite, Total Nitrogen	R	R	R	R	R	R	R	R	R	R	R	R	R	Total Kjeldahl Nitrogen	R	R	R	R	R	R	R	R	R	R	R	R	R	TOC	R	R	R	R	R	R	R	R	R	R	R	R	R	pH	R	R	R	R	R	R	R	R	R	R	R	R	R	COD	R	R	R	R	R	R	R	R	R	R	R	R	R	Conductivity	R	R	R	R	R	R	R	R	R	R	R	R	R	EPH	R	R	R	R	R	R	R	R	R	R	R	R	R	BTEX / VPH	R	R	R	R	R	R	R	R	R	R	R	R	R	SAMPLES ON HOLD														NUMBER OF CONTAINERS													
	P	F/P	F/P	P	P	P	P	P	P	P	P																																																																																																																																																																																																																																																						
Total Metals	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Dissolved Metals	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Alkalinity	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Dissolved Organic Carbon	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Chloride, Fluoride, sulphate, hardness	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Ammonia	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Nitrate, Nitrite	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Nitrate + Nitrite, Total Nitrogen	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Total Kjeldahl Nitrogen	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
TOC	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
pH	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
COD	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
Conductivity	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
EPH	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
BTEX / VPH	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																				
SAMPLES ON HOLD																																																																																																																																																																																																																																																																	
NUMBER OF CONTAINERS																																																																																																																																																																																																																																																																	
Project Information ALS Account # / Quote #: Job #: Hazelton Surface Water PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		ALS Lab Work Order # (lab use only): ALS Contact: Sampler: H. Shinton																																																																																																																																																																																																																																																													
ALS Sample # (lab use only) SW-05 SW-21 SW-01 SW-02 Field Blank Travel Blank		Sample Iden (This descr) Environmental Division Vancouver Work Order Reference VA22B1224  Telephone: +1 604 253 4188		<table border="1"> <thead> <tr> <th>Date (dd-mm-yy)</th> <th>Time (hh:mm)</th> <th>Sample Type</th> </tr> </thead> <tbody> <tr> <td>17 May 22</td> <td>15:15</td> <td>Water</td> </tr> <tr> <td>17 May 22</td> <td>12:00</td> <td>Water</td> </tr> <tr> <td>17 May 22</td> <td>9:54</td> <td>Water</td> </tr> <tr> <td>17 May 22</td> <td>11:28</td> <td>Water</td> </tr> <tr> <td>17 May 22</td> <td>16:06</td> <td>Water</td> </tr> <tr> <td>17 May 22</td> <td>—</td> <td>Water</td> </tr> </tbody> </table>		Date (dd-mm-yy)	Time (hh:mm)	Sample Type	17 May 22	15:15	Water	17 May 22	12:00	Water	17 May 22	9:54	Water	17 May 22	11:28	Water	17 May 22	16:06	Water	17 May 22	—	Water																																																																																																																																																																																																																																							
Date (dd-mm-yy)	Time (hh:mm)	Sample Type																																																																																																																																																																																																																																																															
17 May 22	15:15	Water																																																																																																																																																																																																																																																															
17 May 22	12:00	Water																																																																																																																																																																																																																																																															
17 May 22	9:54	Water																																																																																																																																																																																																																																																															
17 May 22	11:28	Water																																																																																																																																																																																																																																																															
17 May 22	16:06	Water																																																																																																																																																																																																																																																															
17 May 22	—	Water																																																																																																																																																																																																																																																															
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 8.3 7.5 FINAL COOLER TEMPERATURES °C: 8																																																																																																																																																																																																																																																													
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: May 20 th 2022 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Chris Date: 20 May 22 Time: 1050		FINAL SHIPMENT RECEPTION (lab use only) Received by: DSS Date: May 20 Time: 8:35P																																																																																																																																																																																																																																																													

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

SEPT 2017 FORM

CERTIFICATE OF ANALYSIS

Work Order : **VA22B2453**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Surface Water
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 12
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 03-Jun-2022 11:10
Date Analysis Commenced : 05-Jun-2022
Issue Date : 07-Jul-2022 13:27

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Elke Tabora		Inorganics, Calgary, Alberta
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
DTMF	<i>Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.</i>



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-07	SW-08 (DUP)	SW-09	SGW-01	SGW-02
(Matrix: Water)										
Client sampling date / time					02-Jun-2022 09:43	02-Jun-2022 12:00	02-Jun-2022 12:56	02-Jun-2022 11:07	02-Jun-2022 01:47	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-001	VA22B2453-002	VA22B2453-003	VA22B2453-004	VA22B2453-005	
					Result	Result	Result	Result	Result	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	23.7	24.0	272	95.0	230	
conductivity	----	E100	2.0	µS/cm	151	150	631	184	483	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	39.8	39.5	260	93.0	215	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	40.1	38.5	242	93.9	195	
pH	----	E108	0.10	pH units	7.37	7.36	8.59	7.98	8.45	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0076	0.0089	0.0269	0.0144	0.0383	
chloride	16887-00-6	E235.Cl	0.50	mg/L	28.8	29.0	47.1	<0.50	23.5	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.034	0.035	<0.100 ^{DLDS}	0.035	0.090	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.614	0.648	0.782	0.848	1.59	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0.497	<0.0050	<0.0050	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	<0.0050 ^{DLDS}	<0.0010	<0.0010	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	3.64	<0.30	<0.30	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	21.2	20.9	12.0	20.8	25.3	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	21.2	21.1	12.3	20.8	26.0	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.141	0.139	0.0186	0.101	0.0336	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0.00017	0.00012	0.00014	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00043	0.00038	0.00085	0.00141	0.00307	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0165	0.0165	0.0568	0.0245	0.0362	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0.356	<0.010	0.250	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000054	<0.0000050	<0.0000050	0.0000209	<0.0000050	
calcium, total	7440-70-2	E420	0.050	mg/L	11.8	11.1	68.3	29.5	55.2	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0.00020	0.00052	0.00091	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00147	0.00145	0.00064	0.00244	<0.00050	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-07	SW-08 (DUP)	SW-09	SGW-01	SGW-02
Client sampling date / time					02-Jun-2022 09:43	02-Jun-2022 12:00	02-Jun-2022 12:56	02-Jun-2022 11:07	02-Jun-2022 01:47	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-001	VA22B2453-002	VA22B2453-003	VA22B2453-004	VA22B2453-005	
					Result	Result	Result	Result	Result	
Total Metals										
iron, total	7439-89-6	E420	0.010	mg/L	0.175	0.171	0.032	0.555	1.48	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
magnesium, total	7439-95-4	E420	0.0050	mg/L	2.58	2.62	17.4	4.92	13.9	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00940	0.00866	0.0366	0.450	0.928	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	0.000050	0.000653	0.000283	0.000253	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00077	0.00079	0.00301	0.00144	0.00247	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	0.108	
potassium, total	7440-09-7	E420	0.050	mg/L	0.805	0.804	10.0	1.10	5.17	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00043	0.00049	0.00161	0.00053	0.00152	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000051	<0.000050	0.000077	0.000112	0.000096	
silicon, total	7440-21-3	E420	0.10	mg/L	1.94	1.90	1.27	3.62	2.42	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, total	7440-23-5	E420	0.050	mg/L	14.2	14.4	43.4	2.22	26.7	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0771	0.0775	0.459	0.165	0.356	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	2.11	<0.50	<0.50	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00080	0.00089	<0.00030	0.00109	<0.00090 ^{DLM}	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0.000337	0.000020	0.000090	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00027	0.00027	<0.00020	0.00028	<0.00020	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.134	0.136	0.0118	0.0899	0.0217	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0.00015	0.00012	0.00010	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00041	0.00037	0.00083	0.00099	0.00192	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-07	SW-08 (DUP)	SW-09	SGW-01	SGW-02
Client sampling date / time					02-Jun-2022 09:43	02-Jun-2022 12:00	02-Jun-2022 12:56	02-Jun-2022 11:07	02-Jun-2022 01:47	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-001	VA22B2453-002	VA22B2453-003	VA22B2453-004	VA22B2453-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0138	0.0139	0.0486	0.0187	0.0316	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0.377	0.015	0.248	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000092	0.0000088	<0.0000050	0.0000143	0.0000065	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	11.9	11.8	75.0	30.3	62.6	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0.00019	0.00039	0.00067	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00133	0.00142	0.00058	0.00234	0.00040	
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.154	0.157	0.018	0.265	0.514	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.46	2.43	17.6	4.20	14.2	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00642	0.00678	0.0213	0.276	0.620	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0.000653	0.000251	0.000277	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00070	0.00069	0.00285	0.00151	0.00230	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.695	0.699	8.62	0.876	4.90	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00035	0.00034	0.00147	0.00046	0.00153	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000056	0.000050	0.000066	0.000094	0.000132	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.94	1.95	1.19	3.98	2.33	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	14.6	14.7	44.5	2.23	28.0	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0813	0.0809	0.505	0.161	0.390	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	1.94	<0.50	<0.50	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-07	SW-08 (DUP)	SW-09	SGW-01	SGW-02
Client sampling date / time					02-Jun-2022 09:43	02-Jun-2022 12:00	02-Jun-2022 12:56	02-Jun-2022 11:07	02-Jun-2022 01:47	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-001	VA22B2453-002	VA22B2453-003	VA22B2453-004	VA22B2453-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00150 ^{DLM}	<0.00150 ^{DLM}	<0.00030	0.00105	0.00058	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	0.000011	0.000409	0.000022	0.000126 ^{DTMF}	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	0.0015	<0.0010	0.0015	0.0011	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00032	0.00030	<0.00020	0.00040	<0.00020	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	53	50	33	54	74	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	82.3	86.2	86.1	87.9	90.1	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	102	101	102	101	102	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	<100	<100	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	<400	<400	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	<100	<100	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	81.4	110	98.9	109	97.6	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	71.3	75.9	89.6	91.1	98.5	



Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SGW-04	SGW-05	----	----	----
Client sampling date / time					02-Jun-2022 03:15	02-Jun-2022 12:07	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-006 Result	VA22B2453-007 Result	-----	-----	-----	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	269	200	----	----	----	
conductivity	----	E100	2.0	µS/cm	470	357	----	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	286	206	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	276	---	----	----	----	
pH	----	E108	0.10	pH units	8.58	8.49	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0452	0.103	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	2.23	1.29	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.058	0.070	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.853	0.699	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	0.0012	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	2.01	1.38	----	----	----	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	15.6	9.47	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	14.9	8.56	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	1.67	----	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00014	----	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00230	----	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.116	----	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	0.000102	----	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	----	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.000355	----	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	69.6	----	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000133	----	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00147	----	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00720	----	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	0.0196	----	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	9.90	----	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SGW-04	SGW-05	----	----	----
Client sampling date / time					02-Jun-2022 03:15	02-Jun-2022 12:07	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-006	VA22B2453-007	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
lead, total	7439-92-1	E420	0.000050	mg/L	0.00438	---	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0027	---	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	24.7	---	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	1.58	---	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0000510	---	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000262	---	---	---	---	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00876	---	---	---	---	
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.166	---	---	---	---	
potassium, total	7440-09-7	E420	0.050	mg/L	1.77	---	---	---	---	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00076	---	---	---	---	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000103	---	---	---	---	
silicon, total	7440-21-3	E420	0.10	mg/L	6.56	---	---	---	---	
silver, total	7440-22-4	E420	0.000010	mg/L	0.000014	---	---	---	---	
sodium, total	7440-23-5	E420	0.050	mg/L	4.78	---	---	---	---	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.628	---	---	---	---	
sulfur, total	7704-34-9	E420	0.50	mg/L	1.17	---	---	---	---	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	---	---	---	---	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000022	---	---	---	---	
thorium, total	7440-29-1	E420	0.00010	mg/L	0.00015	---	---	---	---	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	---	---	---	---	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00533	---	---	---	---	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	---	---	---	---	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000659	---	---	---	---	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00431	---	---	---	---	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0198	---	---	---	---	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00033	---	---	---	---	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0574	0.0185	---	---	---	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00012	<0.00010	---	---	---	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00137	0.00150	---	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0553	0.0425	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SGW-04	SGW-05	----	----	----
Client sampling date / time					02-Jun-2022 03:15	02-Jun-2022 12:07	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-006	VA22B2453-007	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.010	<0.010	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000300	0.0000207	----	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	74.8	60.2	----	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00212	0.00134	----	----	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00263	0.00126	----	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	2.66	0.944	----	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000057	<0.000050	----	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0013	<0.0010	----	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	24.2	13.4	----	----	----	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	1.41	1.06	----	----	----	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00237 ^{DTMF}	0.00155	----	----	----	
nickel, dissolved	7440-02-0	E421	0.000050	mg/L	0.00378	0.00219	----	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	----	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.39	1.08	----	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00021	0.00024	----	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000127	<0.000050	----	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.64	4.47	----	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	4.60	5.47	----	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.617	0.394	----	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	0.92	0.52	----	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00080	0.00037	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SGW-04	SGW-05	----	----	----
Client sampling date / time					02-Jun-2022 03:15	02-Jun-2022 12:07	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B2453-006	VA22B2453-007	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000633	0.000259	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	---	---	---	
dissolved metals filtration location	----	EP421	-	-	Field	Field	---	---	---	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	64	46	---	---	---	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	---	---	---	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	---	---	---	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	87.2	79.9	---	---	---	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	102	102	---	---	---	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	---	---	---	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	---	---	---	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	---	---	---	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	---	---	---	
VPHw	----	EC580A	100	µg/L	<100	<100	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	87.2	101	---	---	---	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	87.9	118	---	---	---	



Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B2453	Page	: 1 of 25
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Surface Water	Date Samples Received	: 03-Jun-2022 11:10
PO	: ----	Issue Date	: 07-Jul-2022 13:32
C-O-C number	: ----		
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Dissolved Metals	QC-522119-001	----	potassium, dissolved	7440-09-7	E421	0.057 ^B mg/L	0.05 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-01	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-02	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-04	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SGW-05	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-07	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-08 (DUP)	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-09	E559-L	02-Jun-2022	----	----	----		09-Jun-2022	28 days	7 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-01	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	13 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-05	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	13 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-07	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	13 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-08 (DUP)	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	13 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-09	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	13 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-02	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SGW-04	E298	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SGW-01	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SGW-04	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE SGW-05	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-07	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-08 (DUP)	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-09	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SGW-02	E235.Cl	02-Jun-2022	----	----	----		05-Jun-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SGW-01	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SGW-04	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SGW-05	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-07	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-08 (DUP)	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-09	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SGW-02	E235.F	02-Jun-2022	----	----	----		05-Jun-2022	28 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SGW-01	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SGW-04	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SGW-05	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SW-07	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SW-08 (DUP)	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SW-09	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SGW-02	E235.NO3-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	4 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-01	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-04	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-05	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-07	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-08 (DUP)	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-09	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	3 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SGW-02	E235.NO2-L	02-Jun-2022	----	----	----		05-Jun-2022	3 days	4 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-01	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-04	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-05	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-07	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-08 (DUP)	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-09	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	3 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SGW-02	E235.SO4	02-Jun-2022	----	----	----		05-Jun-2022	28 days	4 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-01	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-02	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-04	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SGW-05	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-07	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-08 (DUP)	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-09	E318	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-01	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-05	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-07	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-08 (DUP)	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	5 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-09	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	5 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-02	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	6 days	✓	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SGW-04	E509	02-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	6 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-01	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-02	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-04	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SGW-05	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-07	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-08 (DUP)	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-09	E421	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	180 days	14 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-07	E601A	02-Jun-2022	15-Jun-2022	14 days	13 days	✓	16-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-01	E601A	02-Jun-2022	16-Jun-2022	14 days	14 days	✓	17-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-02	E601A	02-Jun-2022	15-Jun-2022	14 days	14 days	✓	16-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-04	E601A	02-Jun-2022	15-Jun-2022	14 days	14 days	✓	16-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SGW-05	E601A	02-Jun-2022	16-Jun-2022	14 days	14 days	✓	17-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-08 (DUP)	E601A	02-Jun-2022	16-Jun-2022	14 days	14 days	✓	17-Jun-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-09	E601A	02-Jun-2022	16-Jun-2022	14 days	14 days	✓	17-Jun-2022	40 days	1 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-01	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-02	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	13 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-04	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	13 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SGW-05	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-07	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-08 (DUP)	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-09	E581.VH+F1	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-01	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	* EHT	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-05	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	* EHT	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-07	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	* EHT	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-08 (DUP)	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	* EHT	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-09	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-02	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	35 days	*	EHT
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SGW-04	E358-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	35 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-01	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-05	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-07	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-08 (DUP)	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-09	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	34 days	*	EHT
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-02	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	35 days	*	EHT



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SGW-04	E355-L	02-Jun-2022	30-Jun-2022	----	----		06-Jul-2022	28 days	35 days	*	EHT
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-01	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-05	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-07	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-08 (DUP)	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-09	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	6 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-02	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	7 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SGW-04	E290	02-Jun-2022	----	----	----		08-Jun-2022	14 days	7 days	✓	
Physical Tests : Conductivity in Water											
HDPE SGW-01	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Physical Tests : Conductivity in Water										
HDPE SGW-05	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-07	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-08 (DUP)	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-09	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE SGW-02	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE SGW-04	E100	02-Jun-2022	----	----	----		08-Jun-2022	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE SW-09	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	146 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE SGW-05	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	147 hrs	* EHTR-FM
Physical Tests : pH by Meter										
HDPE SW-08 (DUP)	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	147 hrs	* EHTR-FM



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
Rec	Actual	Rec		Actual							
Physical Tests : pH by Meter											
HDPE SGW-01	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	148 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-07	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	150 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SGW-04	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	156 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SGW-02	E108	02-Jun-2022	----	----	----		08-Jun-2022	0.25 hrs	157 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-01	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-04	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-07	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-08 (DUP)	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-09	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	6 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SGW-02	E508	02-Jun-2022	----	----	----		08-Jun-2022	28 days	7 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-01	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	14 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-08 (DUP)	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	14 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-09	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	14 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-02	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	15 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SGW-04	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	15 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-07	E420	02-Jun-2022	----	----	----		16-Jun-2022	180 days	15 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-01	E611A	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-02	E611A	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	13 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-04	E611A	02-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	14 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SGW-05	E611A	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-07	E611A	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-08 (DUP)	E611A	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-09	E611A	02-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	14 days	13 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	511875	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	525218	2	24	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	524606	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	517258	1	7	14.2	5.0	✓
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Conductivity in Water	E100	511874	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	514698	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	522119	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	545637	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
pH by Meter	E108	511873	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	515235	2	21	9.5	5.0	✓
Total Mercury in Water by CVAAS	E508	515979	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	523340	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	545639	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	524605	2	26	7.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	511875	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	525218	2	24	8.3	5.0	✓
BC PHCs - EPH by GC-FID	E601A	525293	2	24	8.3	5.0	✓
BTEX by Headspace GC-MS	E611A	524606	2	27	7.4	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	517258	1	7	14.2	5.0	✓
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Conductivity in Water	E100	511874	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	514698	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	522119	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	545637	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
pH by Meter	E108	511873	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	515235	2	21	9.5	5.0	✓
Total Mercury in Water by CVAAS	E508	515979	1	20	5.0	5.0	✓



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Metals in Water by CRC ICPMS	E420	523340	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	545639	1	20	5.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	524605	2	26	7.6	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	511875	1	14	7.1	5.0	✔
Ammonia by Fluorescence	E298	525218	2	24	8.3	5.0	✔
BC PHCs - EPH by GC-FID	E601A	525293	2	24	8.3	5.0	✔
BTEX by Headspace GC-MS	E611A	524606	2	27	7.4	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	517258	1	7	14.2	5.0	✔
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✔
Conductivity in Water	E100	511874	1	14	7.1	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	514698	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	522119	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	545637	1	20	5.0	5.0	✔
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✔
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	515235	2	21	9.5	5.0	✔
Total Mercury in Water by CVAAS	E508	515979	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	523340	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	545639	1	20	5.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	524605	2	26	7.6	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	525218	2	24	8.3	5.0	✔
BTEX by Headspace GC-MS	E611A	524606	2	27	7.4	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	517258	1	7	14.2	5.0	✔
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	514698	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	522119	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	545637	1	20	5.0	5.0	✔
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✔
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	515235	1	21	4.7	5.0	✖
Total Mercury in Water by CVAAS	E508	515979	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	523340	1	20	5.0	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	545639	1	20	5.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	524605	2	26	7.6	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Calgary - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order : **VA22B2453**
Client : Regional District of Kitimat-Stikine
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Surface Water
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 19
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 03-Jun-2022 11:10
Date Analysis Commenced : 05-Jun-2022
Issue Date : 07-Jul-2022 13:27

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

Page : 2 of 19
Work Order : VA22B2453
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 511873)											
FJ2201438-001	Anonymous	pH	----	E108	0.10	pH units	8.03	8.04	0.124%	4%	----
Physical Tests (QC Lot: 511874)											
FJ2201438-001	Anonymous	conductivity	----	E100	2.0	µS/cm	227	227	0.00%	10%	----
Physical Tests (QC Lot: 511875)											
FJ2201438-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	100	97.4	2.63%	20%	----
Anions and Nutrients (QC Lot: 511876)											
VA22B2224-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	<0.200	0.168	0.032	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511877)											
VA22B2224-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511878)											
VA22B2224-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511879)											
VA22B2224-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511880)											
VA22B2224-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	0.50	0.49	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 515235)											
RG2200415-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.20	1.20	0.351%	20%	----
Anions and Nutrients (QC Lot: 515236)											
VA22B2453-007	SGW-05	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.699	0.706	1.02%	20%	----
Anions and Nutrients (QC Lot: 525218)											
FJ2201494-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	5.00	mg/L	140	137	1.67%	20%	----
Anions and Nutrients (QC Lot: 525219)											
VA22B2453-004	SGW-01	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0144	0.0137	0.0007	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 545637)											
VA22B2453-001	SW-07	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	21.2	20.8	2.15%	20%	----
Organic / Inorganic Carbon (QC Lot: 545639)											
VA22B2453-001	SW-07	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	21.2	21.3	0.494%	20%	----
Total Metals (QC Lot: 515979)											
FJ2201432-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 523340)											
VA22B2453-001	SW-07	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.141	0.141	0.317%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 523340) - continued											
VA22B2453-001	SW-07	antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00043	0.00040	0.00003	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0165	0.0160	2.88%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000054	<0.0000050	0.0000004	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	11.8	11.6	2.02%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.000050	mg/L	0.00147	0.00143	0.00004	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.175	0.172	1.38%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	2.58	2.61	1.21%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00940	0.00875	7.09%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.000050	mg/L	0.00077	0.00080	0.00003	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.805	0.795	1.22%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00043	0.00044	0.000006	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000051	0.000093	0.000042	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.94	1.88	2.84%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	14.2	14.5	2.46%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0771	0.0745	3.40%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00080	0.00082	0.00003	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 523340) - continued											
VA22B2453-001	SW-07	vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00027	0.00027	0.0000006	Diff <2x LOR	----
Dissolved Metals (QC Lot: 514698)											
VA22B2451-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 522119)											
VA22B2445-006	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0042	0.0041	0.0001	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00036	0.00037	0.000009	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00462	0.00455	1.42%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.012	0.012	0.0002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	84.4	84.6	0.214%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00030	0.00031	0.000006	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00094	0.00094	0.000005	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.015	0.015	0.0002	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	8.49	8.30	2.30%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00974	0.00980	0.665%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00487	0.00466	4.37%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.851	0.861	1.14%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00069	0.00065	0.00004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000204	0.000170	0.000034	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.65	3.68	0.826%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	17.2	16.9	1.35%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.199	0.192	3.54%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	51.7	51.9	0.526%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 522119) - continued											
VA22B2445-006	Anonymous	tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000396	0.000393	0.713%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 517258)											
VA22B2453-001	SW-07	chemical oxygen demand [COD]	----	E559-L	10	mg/L	53	50	3	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 524606)											
VA22B2149-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	2.48	2.36	0.11	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	1.84	1.60	0.24	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	0.38	0.30	0.08	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 525385)											
KS2201948-024	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 524605)											
VA22B2149-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
Hydrocarbons (QC Lot: 525384)											
KS2201948-024	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 511874)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 511875)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.0	----
Anions and Nutrients (QCLot: 511876)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 511877)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 511878)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 511879)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 511880)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 515235)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 515236)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 525218)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 525219)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 545637)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 545639)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 515979)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 523340)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 523340) - continued						
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 514698)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 522119)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	# 0.057	B
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 522119) - continued						
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---
Aggregate Organics (QCLot: 517258)						
chemical oxygen demand [COD]	---	E559-L	10	mg/L	<10	---
Volatile Organic Compounds (QCLot: 524606)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	---
styrene	100-42-5	E611A	0.5	µg/L	<0.50	---
toluene	108-88-3	E611A	0.5	µg/L	<0.50	---
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	---
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	---
Volatile Organic Compounds (QCLot: 525385)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	---
styrene	100-42-5	E611A	0.5	µg/L	<0.50	---
toluene	108-88-3	E611A	0.5	µg/L	<0.50	---
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	---
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	---
Hydrocarbons (QCLot: 524605)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	---
Hydrocarbons (QCLot: 525293)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
Hydrocarbons (QCLot: 525384)						
VHw (C6-C10)	---	E581.VH+F1	100	µg/L	<100	---
Hydrocarbons (QCLot: 525615)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---

Qualifiers

Qualifier Description

B Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				Qualifier
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		
						Low	High		
Physical Tests (QCLot: 511873)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 511874)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 511875)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.8	85.0	115	----
Anions and Nutrients (QCLot: 511876)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 511877)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 511878)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 511879)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.5	90.0	110	----
Anions and Nutrients (QCLot: 511880)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 515235)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 515236)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 525218)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.0	85.0	115	----
Anions and Nutrients (QCLot: 525219)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	107	85.0	115	----
Organic / Inorganic Carbon (QCLot: 545637)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	107	80.0	120	----
Organic / Inorganic Carbon (QCLot: 545639)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	94.6	80.0	120	----
Total Metals (QCLot: 515979)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	90.1	80.0	120	----
Total Metals (QCLot: 523340)									



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 523340) - continued									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	95.3	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	92.0	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	93.4	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.0	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	111	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	96.9	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	94.3	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	98.8	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	109	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	97.5	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.1	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	105	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	94.7	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	84.4	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	96.4	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	93.1	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	97.1	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	102	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 523340) - continued									
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.6	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	95.9	80.0	120	----
Dissolved Metals (QCLot: 522119)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.0	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	97.5	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.5	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.8	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	113	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.1	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	96.1	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.5	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.5	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.6	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	99.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.7	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	98.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.6	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	98.4	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	91.8	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.4	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.4	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.3	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	96.4	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	94.9	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	106	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	99.3	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.2	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 522119) - continued									
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	110	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.2	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.8	80.0	120	----
Aggregate Organics (QCLot: 517258)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	112	85.0	115	----
Volatile Organic Compounds (QCLot: 524606)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	95.6	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	90.5	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	96.9	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	96.5	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	93.4	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	98.2	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	90.8	70.0	130	----
Volatile Organic Compounds (QCLot: 525385)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	97.4	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	82.8	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	103	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	91.8	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	92.1	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	104	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	89.8	70.0	130	----
Hydrocarbons (QCLot: 524605)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	82.9	70.0	130	----
Hydrocarbons (QCLot: 525293)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	111	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	112	70.0	130	----
Hydrocarbons (QCLot: 525384)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	85.2	70.0	130	----
Hydrocarbons (QCLot: 525615)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	112	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	115	70.0	130	----

Page : 15 of 19
Work Order : VA22B2453
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 511876)										
VA22B2224-002	Anonymous	fluoride	16984-48-8	E235.F	1.14 mg/L	1 mg/L	114	75.0	125	----
Anions and Nutrients (QCLot: 511877)										
VA22B2224-002	Anonymous	chloride	16887-00-6	E235.Cl	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 511878)										
VA22B2224-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.67 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 511879)										
VA22B2224-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.534 mg/L	0.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 511880)										
VA22B2224-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 515235)										
RG2200415-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.63 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 525218)										
FJ2201494-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 525219)										
VA22B2453-005	SGW-02	ammonia, total (as N)	7664-41-7	E298	0.106 mg/L	0.1 mg/L	106	75.0	125	----
Organic / Inorganic Carbon (QCLot: 545637)										
VA22B2453-001	SW-07	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 545639)										
VA22B2453-001	SW-07	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 515979)										
FJ2201432-003	Anonymous	mercury, total	7439-97-6	E508	0.0000934 mg/L	0.0001 mg/L	93.4	70.0	130	----
Total Metals (QCLot: 523340)										
VA22B2453-002	SW-08 (DUP)	aluminum, total	7429-90-5	E420	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		antimony, total	7440-36-0	E420	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		barium, total	7440-39-3	E420	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0372 mg/L	0.04 mg/L	93.1	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00985 mg/L	0.01 mg/L	98.5	70.0	130	----
		boron, total	7440-42-8	E420	0.091 mg/L	0.1 mg/L	91.0	70.0	130	----



Sub-Matrix: Water

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 523340) - continued										
VA22B2453-002	SW-08 (DUP)	cadmium, total	7440-43-9	E420	0.00389 mg/L	0.004 mg/L	97.2	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00975 mg/L	0.01 mg/L	97.5	70.0	130	----
		chromium, total	7440-47-3	E420	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		copper, total	7440-50-8	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		iron, total	7439-89-6	E420	1.91 mg/L	2 mg/L	95.7	70.0	130	----
		lead, total	7439-92-1	E420	0.0180 mg/L	0.02 mg/L	90.2	70.0	130	----
		lithium, total	7439-93-2	E420	0.0905 mg/L	0.1 mg/L	90.5	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		nickel, total	7440-02-0	E420	0.0395 mg/L	0.04 mg/L	98.9	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.6 mg/L	10 mg/L	106	70.0	130	----
		potassium, total	7440-09-7	E420	4.07 mg/L	4 mg/L	102	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		selenium, total	7782-49-2	E420	0.0376 mg/L	0.04 mg/L	94.1	70.0	130	----
		silicon, total	7440-21-3	E420	9.20 mg/L	10 mg/L	92.0	70.0	130	----
		silver, total	7440-22-4	E420	0.00380 mg/L	0.004 mg/L	94.9	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	19.4 mg/L	20 mg/L	97.1	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	----
		thallium, total	7440-28-0	E420	0.00346 mg/L	0.004 mg/L	86.5	70.0	130	----
		thorium, total	7440-29-1	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		tin, total	7440-31-5	E420	0.0191 mg/L	0.02 mg/L	95.7	70.0	130	----
		titanium, total	7440-32-6	E420	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0181 mg/L	0.02 mg/L	90.7	70.0	130	----
		uranium, total	7440-61-1	E420	0.00361 mg/L	0.004 mg/L	90.2	70.0	130	----
		vanadium, total	7440-62-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		zinc, total	7440-66-6	E420	0.389 mg/L	0.4 mg/L	97.2	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0426 mg/L	0.04 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 514698)										
VA22B2451-002	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000883 mg/L	0.0001 mg/L	88.3	70.0	130	----
Dissolved Metals (QCLot: 522119)										
VA22B2445-007	Anonymous	aluminum, dissolved	7429-90-5	E421	0.190 mg/L	0.2 mg/L	95.0	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 522119) - continued										
VA22B2445-007	Anonymous	antimony, dissolved	7440-36-0	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0158 mg/L	0.02 mg/L	79.3	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00903 mg/L	0.01 mg/L	90.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.090 mg/L	0.1 mg/L	89.6	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00380 mg/L	0.004 mg/L	95.1	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00960 mg/L	0.01 mg/L	96.0	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0179 mg/L	0.02 mg/L	89.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.89 mg/L	2 mg/L	94.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0377 mg/L	0.04 mg/L	94.4	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.69 mg/L	10 mg/L	96.9	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0194 mg/L	0.02 mg/L	97.3	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.40 mg/L	10 mg/L	94.0	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00337 mg/L	0.004 mg/L	84.3	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0170 mg/L	0.02 mg/L	85.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00413 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0979 mg/L	0.1 mg/L	97.9	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.382 mg/L	0.4 mg/L	95.6	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 522119) - continued										
VA22B2445-007	Anonymous	zirconium, dissolved	7440-67-7	E421	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
Aggregate Organics (QCLot: 517258)										
VA22B2453-002	SW-08 (DUP)	chemical oxygen demand [COD]	----	E559-L	104 mg/L	100 mg/L	104	75.0	125	----
Volatile Organic Compounds (QCLot: 524606)										
VA22B2149-002	Anonymous	benzene	71-43-2	E611A	109 µg/L	100 µg/L	109	60.0	140	----
		ethylbenzene	100-41-4	E611A	103 µg/L	100 µg/L	103	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	106 µg/L	100 µg/L	106	60.0	140	----
		styrene	100-42-5	E611A	108 µg/L	100 µg/L	108	60.0	140	----
		toluene	108-88-3	E611A	106 µg/L	100 µg/L	106	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	216 µg/L	200 µg/L	108	60.0	140	----
		xylene, o-	95-47-6	E611A	103 µg/L	100 µg/L	103	60.0	140	----
Volatile Organic Compounds (QCLot: 525385)										
KS2201948-024	Anonymous	benzene	71-43-2	E611A	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		ethylbenzene	100-41-4	E611A	84.0 µg/L	100 µg/L	84.0	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	103 µg/L	100 µg/L	103	60.0	140	----
		styrene	100-42-5	E611A	90.0 µg/L	100 µg/L	90.0	60.0	140	----
		toluene	108-88-3	E611A	92.9 µg/L	100 µg/L	92.9	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	213 µg/L	200 µg/L	107	60.0	140	----
		xylene, o-	95-47-6	E611A	91.0 µg/L	100 µg/L	91.0	60.0	140	----
Hydrocarbons (QCLot: 524605)										
VA22B2453-005	SGW-02	VHw (C6-C10)	----	E581.VH+F1	5200 µg/L	6310 µg/L	82.4	60.0	140	----
Hydrocarbons (QCLot: 525384)										
KS2201948-025	Anonymous	VHw (C6-C10)	----	E581.VH+F1	4710 µg/L	6310 µg/L	74.7	60.0	140	----



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nlavoie@rdks.bc.ca Email 3: eblaney@rdks.bc.ca		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular (R) <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply Priority (Business Day) <input type="checkbox"/> 4 day [P4-20%] <input type="checkbox"/> <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> Emergency <input type="checkbox"/> 1 Business day [E1 - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]																																																																																																																																																																																																																																																																																																																																																																																								
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca; hshinton@rdks.bc.ca Email 2: nlavoie@rdks.bc.ca		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <thead> <tr> <th></th> <th>P</th> <th>F/P</th> <th>F/P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> <th>P</th> </tr> </thead> <tbody> <tr> <td>Total Metals</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Dissolved Metals</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Alkalinity</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Dissolved Organic Carbon</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Chloride, Fluoride, sulphate, hardness</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Ammonia</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Nitrate</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Nitrite</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Total Kjeldahl Nitrogen</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>TOC</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>pH</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>COD</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Conductivity</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>EPH</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>BTEX / VPH</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>SAMPLES ON HOLD</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td colspan="18">Sample is hazardous (please provide further detail)</td> </tr> <tr> <td colspan="18">NUMBER OF CONTAINERS</td> </tr> </tbody> </table>																			P	F/P	F/P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Total Metals																			Dissolved Metals																			Alkalinity																			Dissolved Organic Carbon																			Chloride, Fluoride, sulphate, hardness																			Ammonia																			Nitrate																			Nitrite																			Total Kjeldahl Nitrogen																			TOC																			pH																			COD																			Conductivity																			EPH																			BTEX / VPH																			SAMPLES ON HOLD																			Sample is hazardous (please provide further detail)																		NUMBER OF CONTAINERS																	
	P	F/P	F/P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P																																																																																																																																																																																																																																																																																																																																																																										
Total Metals																																																																																																																																																																																																																																																																																																																																																																																												
Dissolved Metals																																																																																																																																																																																																																																																																																																																																																																																												
Alkalinity																																																																																																																																																																																																																																																																																																																																																																																												
Dissolved Organic Carbon																																																																																																																																																																																																																																																																																																																																																																																												
Chloride, Fluoride, sulphate, hardness																																																																																																																																																																																																																																																																																																																																																																																												
Ammonia																																																																																																																																																																																																																																																																																																																																																																																												
Nitrate																																																																																																																																																																																																																																																																																																																																																																																												
Nitrite																																																																																																																																																																																																																																																																																																																																																																																												
Total Kjeldahl Nitrogen																																																																																																																																																																																																																																																																																																																																																																																												
TOC																																																																																																																																																																																																																																																																																																																																																																																												
pH																																																																																																																																																																																																																																																																																																																																																																																												
COD																																																																																																																																																																																																																																																																																																																																																																																												
Conductivity																																																																																																																																																																																																																																																																																																																																																																																												
EPH																																																																																																																																																																																																																																																																																																																																																																																												
BTEX / VPH																																																																																																																																																																																																																																																																																																																																																																																												
SAMPLES ON HOLD																																																																																																																																																																																																																																																																																																																																																																																												
Sample is hazardous (please provide further detail)																																																																																																																																																																																																																																																																																																																																																																																												
NUMBER OF CONTAINERS																																																																																																																																																																																																																																																																																																																																																																																												
Project Information ALS Account # / Quote #: Job #: Hazelton Surface Water PO / AFE: LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		ALS Lab Work Order # (lab use only): ALS Contact: H. Shinton Sampler: H. Shinton																																																																																																																																																																																																																																																																																																																																																																																								
ALS Sample # (lab use only) Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy) Time (hh:mm) Sample Type		<table border="1"> <thead> <tr> <th></th> <th>Total Metals</th> <th>Dissolved Metals</th> <th>Alkalinity</th> <th>Dissolved Organic Carbon</th> <th>Chloride, Fluoride, sulphate, hardness</th> <th>Ammonia</th> <th>Nitrate</th> <th>Nitrite</th> <th>Total Kjeldahl Nitrogen</th> <th>TOC</th> <th>pH</th> <th>COD</th> <th>Conductivity</th> <th>EPH</th> <th>BTEX / VPH</th> <th>SAMPLES ON HOLD</th> <th>Sample is hazardous (please provide further detail)</th> <th>NUMBER OF CONTAINERS</th> </tr> </thead> <tbody> <tr> <td>SW-07</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SW-08 (DUP)</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SW-09</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SGW-01</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SGW-02</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SGW-04</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> <tr> <td>SGW-05</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td> </tr> </tbody> </table>																			Total Metals	Dissolved Metals	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, sulphate, hardness	Ammonia	Nitrate	Nitrite	Total Kjeldahl Nitrogen	TOC	pH	COD	Conductivity	EPH	BTEX / VPH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	SW-07	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SW-08 (DUP)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SW-09	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SGW-01	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SGW-02	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SGW-04	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				SGW-05	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																		
	Total Metals	Dissolved Metals	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, sulphate, hardness	Ammonia	Nitrate	Nitrite	Total Kjeldahl Nitrogen	TOC	pH	COD	Conductivity	EPH	BTEX / VPH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS																																																																																																																																																																																																																																																																																																																																																																										
SW-07	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SW-08 (DUP)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SW-09	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SGW-01	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SGW-02	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SGW-04	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
SGW-05	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																																																																																																																																																																																																																																																																																																													
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Add on report by clicking on the drop-down list below (electronic COC only). Water Quality Guidelines (MAY, 2015)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 100 FINAL COOLER TEMPERATURES °C: 21																																																																																																																																																																																																																																																																																																																																																																																								
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: June 2nd, 2022 Time:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <i>D. Macpherson</i> Date: June 21, 2022 Time: 12:30		FINAL SHIPMENT RECEPTION (lab use only) Received by: <i>Ice packs IC</i> Date: 3 JUN 2022 Time: 11:10 AM																																																																																																																																																																																																																																																																																																																																																																																								

Terrace Shipping
 # 2 Coolers Ground
 # 1 Cools Air
 SFX

Environmental Division
 Vancouver
 Work Order Reference
VA22B2453

Telephone: +1 604 253 4188



CERTIFICATE OF ANALYSIS

Work Order : **VA22B8570**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton Surface Water
PO : ----
C-O-C number : ----
Sampler : HS
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 11
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 10-Aug-2022 22:00
Date Analysis Commenced : 13-Aug-2022
Issue Date : 19-Aug-2022 10:11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
DLM	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
DTMF	<i>Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.</i>
RRV	<i>Reported result verified by repeat analysis.</i>



Analytical Results

Sub-Matrix: Water					Client sample ID	SW-05	SW-21	SW-02	SW-01	SW-09
(Matrix: Water)					Client sampling date / time	05-Aug-2022 14:20	05-Aug-2022 12:00	05-Aug-2022 10:55	05-Aug-2022 10:20	05-Aug-2022 12:07
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-001	VA22B8570-002	VA22B8570-003	VA22B8570-004	VA22B8570-005	
					Result	Result	Result	Result	Result	
Physical Tests										
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	26.4	25.2	73.5	23.7	342	
conductivity	----	E100	2.0	µS/cm	168	169	131	39.9	757	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	38.0	40.1	60.9	22.9	300	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	40.0	38.7	62.3	27.4	281	
pH	----	E108	0.10	pH units	7.03	7.07	7.70	6.59	8.48	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0152	0.0158	0.338	0.0486 ^{DLM}	0.0256	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.250 ^{DLDS}	
chloride	16887-00-6	E235.Cl	0.50	mg/L	32.4	32.3	<0.50	<0.50	67.4	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.036	0.035	0.062	0.025	<0.100 ^{DLDS}	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.26	1.25	1.00	15.2	1.17	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	<0.0050	0.0100	0.516	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050 ^{DLDS}	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	<0.30	<0.30	<1.50 ^{DLDS}	
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	35.6	33.2	17.7	19.5	17.1	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	31.9	33.4	18.0	62.2	20.0	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.299	0.306	0.0270	2.31	0.0171	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.00020	0.00021	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00109	0.00108	0.00060	0.00720	0.00144	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0255	0.0282	0.0205	0.0548	0.0446	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	0.000051	<0.000050	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	0.416	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000076	0.0000090	<0.0000050	0.000133	<0.0000050	
calcium, total	7440-70-2	E420	0.050	mg/L	12.1	11.7	17.6	7.76	79.3	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000017	0.000018	<0.000010	0.000183	<0.000010	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00055	0.00057	<0.00050	0.00267	<0.00050	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00077	0.00093	0.00037	0.0135	0.00025	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-02	SW-01	SW-09
Client sampling date / time					05-Aug-2022 14:20	05-Aug-2022 12:00	05-Aug-2022 10:55	05-Aug-2022 10:20	05-Aug-2022 12:07	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-001	VA22B8570-002	VA22B8570-003	VA22B8570-004	VA22B8570-005	
					Result	Result	Result	Result	Result	
Total Metals										
copper, total	7440-50-8	E420	0.00050	mg/L	0.00081	0.00083	<0.00050	0.00836	<0.00050	
iron, total	7439-89-6	E420	0.010	mg/L	1.86	2.14	1.14	25.6	0.030	
lead, total	7439-92-1	E420	0.000050	mg/L	0.000284	0.000290	<0.000050	0.00245	<0.000050	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	
magnesium, total	7439-95-4	E420	0.0050	mg/L	2.39	2.30	4.46	1.94	20.1	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.195	0.227	0.0443	2.46	0.0243	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000051	0.000073	0.000082	0.000797	0.00112	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.00124	0.00134	0.00059	0.00420	0.00459	
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.087	0.083	0.123	1.42	0.060	
potassium, total	7440-09-7	E420	0.050	mg/L	0.277	0.289	1.68	0.645	11.2	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00029	0.00032	0.00071	0.00208	0.00206	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000066	0.000088	0.000097	0.000195	0.000107	
silicon, total	7440-21-3	E420	0.10	mg/L	2.03	1.99	5.29	4.50	5.94	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000074	<0.000010	
sodium, total	7440-23-5	E420	0.050	mg/L	18.1	17.2	3.20	0.688	56.1	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0914	0.0911	0.113	0.0617	0.567	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	0.57	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	<0.000010	0.000016	<0.000010	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00311	0.00284	0.00060	0.0373	<0.00030	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	0.000011	<0.000010	0.000060	0.000356	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00082	0.00091	<0.00050	0.00801	<0.00050	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0058	0.0052	<0.0030	0.0192	<0.0030	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	<0.00020	0.00033	<0.00020	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.103	0.131	0.0158	0.160	0.0135	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00022	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-02	SW-01	SW-09
Client sampling date / time					05-Aug-2022 14:20	05-Aug-2022 12:00	05-Aug-2022 10:55	05-Aug-2022 10:20	05-Aug-2022 12:07	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-001	VA22B8570-002	VA22B8570-003	VA22B8570-004	VA22B8570-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00084	0.00101	0.00045	0.00077	0.00163	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0143	0.0183	0.0159	0.0118	0.0486	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	0.470	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000475	0.0000056	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	12.1	12.0	18.1	6.58	84.9	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00055	0.00068	0.00023	0.00063	0.00025	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00049	0.00071	0.00049	0.00184	0.00056	
iron, dissolved	7439-89-6	E421	0.010	mg/L	0.764	0.913	0.437	0.829	0.023	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000082	0.000079	<0.000050	0.000066	<0.000050	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.90	2.46	3.82	1.57	21.4	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.173	0.224	0.0293	0.0917	0.0238	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0.000054	0.000104	0.00116	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00072	0.00092	<0.00050	0.00114	0.00479	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0.052	0.075	0.073	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.337	0.428 ^{DTMF}	1.23	0.517	11.4	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00029	0.00035	0.00049	0.00065	0.00232	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000078	0.000096	0.000067	0.000062	0.000068	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.71	1.81	4.64	2.15	5.88	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	15.2	19.4	2.82	0.726	60.7	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0910	0.0908	0.120	0.0471	0.600	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	0.76	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-02	SW-01	SW-09
Client sampling date / time					05-Aug-2022 14:20	05-Aug-2022 12:00	05-Aug-2022 10:55	05-Aug-2022 10:20	05-Aug-2022 12:07	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-001	VA22B8570-002	VA22B8570-003	VA22B8570-004	VA22B8570-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00074	0.00091	0.00034	0.00168	<0.00030	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000352	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0028	0.0028	0.0016	0.0075	0.0010	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	0.00023	0.00023	<0.00020	0.00031	<0.00020	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field	
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	101	102	52	418	52	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	83.8	83.7	79.6	82.6	81.8	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	102	101	102	102	102	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	<250	<250	<250	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	<100	<100	
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	<400	<400	<400	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	<250	360	<250	
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	<250	380	<250	
VPHw	----	EC580A	100	µg/L	<100	<100	<100	<100	<100	
Hydrocarbons Surrogates										



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW-05	SW-21	SW-02	SW-01	SW-09
Client sampling date / time					05-Aug-2022 14:20	05-Aug-2022 12:00	05-Aug-2022 10:55	05-Aug-2022 10:20	05-Aug-2022 12:07	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-001	VA22B8570-002	VA22B8570-003	VA22B8570-004	VA22B8570-005	
					Result	Result	Result	Result	Result	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	87.1	78.6	86.6	106	92.6	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	106	91.9	83.3	109	85.7	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					05-Aug-2022	05-Aug-2022 16:11	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-006	VA22B8570-007	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
conductivity	---	E100	2.0	µS/cm	<2.0	<2.0	---	---	---	
hardness (as CaCO3), dissolved	---	EC100	0.60	mg/L	---	<0.60	---	---	---	
hardness (as CaCO3), from total Ca/Mg	---	EC100A	0.60	mg/L	<0.60	<0.60	---	---	---	
pH	---	E108	0.10	pH units	5.80	---	---	---	---	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	---	---	---	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	---	<0.0050	---	---	---	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	---	---	---	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	---	---	---	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	---	---	---	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	---	---	---	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	---	---	---	
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					05-Aug-2022	05-Aug-2022 16:11	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-006	VA22B8570-007	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<0.10	---	---	---	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	---	---	---	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	---	---	---	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	---	---	---	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	---	<0.0010	---	---	---	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	---	<0.00010	---	---	---	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	---	<0.00010	---	---	---	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	---	<0.00010	---	---	---	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	---	<0.000100	---	---	---	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	---	<0.000050	---	---	---	
boron, dissolved	7440-42-8	E421	0.010	mg/L	---	<0.010	---	---	---	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	---	<0.0000050	---	---	---	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	---	<0.050	---	---	---	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	---	<0.000010	---	---	---	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	---	<0.00050	---	---	---	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	---	<0.00010	---	---	---	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	---	<0.00020	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					05-Aug-2022	05-Aug-2022 16:11	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-006	VA22B8570-007	-----	-----	-----	
					Result	Result	---	---	---	
Dissolved Metals										
iron, dissolved	7439-89-6	E421	0.010	mg/L	---	<0.010	---	---	---	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	---	<0.000050	---	---	---	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	---	<0.0010	---	---	---	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	---	<0.0050	---	---	---	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	---	<0.00010	---	---	---	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	---	<0.0000050	---	---	---	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	---	<0.000050	---	---	---	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	---	<0.00050	---	---	---	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	---	<0.050	---	---	---	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	---	<0.050	---	---	---	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	---	<0.00020	---	---	---	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	---	<0.000050	---	---	---	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	---	<0.050	---	---	---	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	---	<0.000010	---	---	---	
sodium, dissolved	7440-23-5	E421	0.050	mg/L	---	<0.050	---	---	---	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	---	<0.00020	---	---	---	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	---	<0.50	---	---	---	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	---	<0.00020	---	---	---	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	---	<0.000010	---	---	---	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	---	<0.00010	---	---	---	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	---	<0.00010	---	---	---	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	---	<0.00030	---	---	---	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	---	<0.00010	---	---	---	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	---	<0.000010	---	---	---	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	---	<0.00050	---	---	---	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	---	<0.0010	---	---	---	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	---	<0.00020	---	---	---	
dissolved mercury filtration location	---	EP509	-	-	---	Field	---	---	---	
dissolved metals filtration location	---	EP421	-	-	---	Field	---	---	---	
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L	---	<0.50	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Travel Blank	Field Blank	---	---	---
Client sampling date / time					05-Aug-2022	05-Aug-2022 16:11	---	---	---	
Analyte	CAS Number	Method	LOR	Unit	VA22B8570-006	VA22B8570-007	-----	-----	-----	
					Result	Result	---	---	---	
Volatile Organic Compounds [Fuels]										
ethylbenzene	100-41-4	E611A	0.50	µg/L	---	<0.50	---	---	---	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	---	<0.50	---	---	---	
styrene	100-42-5	E611A	0.50	µg/L	---	<0.50	---	---	---	
toluene	108-88-3	E611A	0.50	µg/L	---	2.80 ^{RRV}	---	---	---	
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	---	1.14 ^{RRV}	---	---	---	
xylene, o-	95-47-6	E611A	0.30	µg/L	---	0.39 ^{RRV}	---	---	---	
xylenes, total	1330-20-7	E611A	0.50	µg/L	---	1.53	---	---	---	
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	---	82.6	---	---	---	
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	---	103	---	---	---	
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	---	<250	---	---	---	
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	---	<100	---	---	---	
EPH (C10-C32)	----	E601A	400	µg/L	---	<400	---	---	---	
EPH (C19-C32)	----	E601A	250	µg/L	---	<250	---	---	---	
TEH (C10-C30), BC	----	E601A	250	µg/L	---	<250	---	---	---	
VPHw	----	EC580A	100	µg/L	---	<100	---	---	---	
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	---	93.2	---	---	---	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	---	107	---	---	---	

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B8570	Page	: 1 of 24
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Surface Water	Date Samples Received	: 10-Aug-2022 22:00
PO	: ----	Issue Date	: 19-Aug-2022 10:11
C-O-C number	: ----		
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Total Metals	QC-MRG2-6007980 01	----	aluminum, total	7429-90-5	E420	0.0031 ^{MB-LOR} mg/L	0.003 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-01	E559-L	05-Aug-2022	----	----	----		18-Aug-2022	28 days	13 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-02	E559-L	05-Aug-2022	----	----	----		18-Aug-2022	28 days	13 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-05	E559-L	05-Aug-2022	----	----	----		18-Aug-2022	28 days	13 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-09	E559-L	05-Aug-2022	----	----	----		18-Aug-2022	28 days	13 days	✓	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)											
Amber glass total (sulfuric acid) SW-21	E559-L	05-Aug-2022	----	----	----		18-Aug-2022	28 days	13 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Field Blank	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-01	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-02	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-05	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-09	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SW-21	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) Travel Blank	E298	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	13 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-01	E235.Br-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-02	E235.Br-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-05	E235.Br-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-09	E235.Br-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SW-21	E235.Br-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-01	E235.Cl	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-02	E235.Cl	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-05	E235.Cl	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-09	E235.Cl	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SW-21	E235.Cl	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-01	E235.F	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-02	E235.F	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-05	E235.F	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-09	E235.F	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SW-21	E235.F	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE Field Blank	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-01	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-02	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-05	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-09	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrate in Water by IC (Low Level)											
HDPE SW-21	E235.NO3-L	05-Aug-2022	13-Aug-2022	3 days	8 days	* EHTR	13-Aug-2022	3 days	0 days	✓	
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-01	E235.NO2-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	3 days	8 days	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-02	E235.NO2-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	3 days	8 days	*	EHTR-FM
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-05	E235.NO2-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	3 days	8 days	*	EHTR-FM
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-09	E235.NO2-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	3 days	8 days	*	EHTR-FM
Anions and Nutrients : Nitrite in Water by IC (Low Level)											
HDPE SW-21	E235.NO2-L	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	3 days	8 days	*	EHTR-FM
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-01	E235.SO4	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-02	E235.SO4	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-05	E235.SO4	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-09	E235.SO4	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE SW-21	E235.SO4	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	28 days	8 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-01	E318	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-02	E318	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-05	E318	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-09	E318	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) SW-21	E318	05-Aug-2022	16-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) Field Blank	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-01	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-02	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✔	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-05	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-09	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Dissolved Metals : Dissolved Mercury in Water by CVAAS											
Glass vial dissolved (hydrochloric acid) SW-21	E509	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) Field Blank	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	7 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-05	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	7 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-01	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	8 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-02	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	8 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-09	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	8 days	✓	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS											
HDPE dissolved (nitric acid) SW-21	E421	05-Aug-2022	13-Aug-2022	----	----		13-Aug-2022	180 days	8 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	05-Aug-2022	16-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-05	E601A	05-Aug-2022	16-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-09	E601A	05-Aug-2022	16-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-21	E601A	05-Aug-2022	16-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-01	E601A	05-Aug-2022	14-Aug-2022	14 days	9 days	✓	15-Aug-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-02	E601A	05-Aug-2022	14-Aug-2022	14 days	9 days	✓	15-Aug-2022	40 days	1 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-01	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-02	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-05	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-09	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-21	E581.VH+F1	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-02	E358-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-05	E358-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-09	E358-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-21	E358-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-01	E358-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-01	E355-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-02	E355-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-05	E355-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-09	E355-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-21	E355-L	05-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	28 days	11 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-01	E290	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	14 days	9 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-02	E290	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	14 days	9 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-05	E290	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	14 days	9 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-09	E290	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	14 days	9 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-21	E290	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	14 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE Field Blank	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Conductivity in Water											
HDPE SW-01	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-02	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-05	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-09	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-21	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE Travel Blank	E100	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	28 days	9 days	✓	
Physical Tests : pH by Meter											
HDPE SW-01	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SW-02	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE SW-05	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	* EHTR-FM	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE SW-09	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-21	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE Travel Blank	E108	05-Aug-2022	13-Aug-2022	----	----		14-Aug-2022	0.25 hrs	23.25 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-01	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-02	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-05	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-09	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-21	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) Travel Blank	E508	05-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	12 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-01	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-02	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-05	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-09	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-21	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	10 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE - total (lab preserved) Travel Blank	E420	05-Aug-2022	14-Aug-2022	----	----		15-Aug-2022	180 days	11 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Field Blank	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-01	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-02	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-05	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-09	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) SW-21	E611A	05-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	11 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHTR: Exceeded ALS recommended hold time prior to sample receipt.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	601270	2	33	6.0	5.0	✓
Ammonia by Fluorescence	E298	605277	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	601275	2	20	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	607899	2	26	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	601274	2	26	7.6	5.0	✓
Conductivity in Water	E100	601271	2	35	5.7	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	606887	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	599145	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605280	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	601273	2	32	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	601276	2	27	7.4	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	601277	2	32	6.2	5.0	✓
pH by Meter	E108	601269	2	34	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	601278	2	26	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	605279	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	606410	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	600798	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605281	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	601270	2	33	6.0	5.0	✓
Ammonia by Fluorescence	E298	605277	1	20	5.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	601985	3	51	5.8	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	601275	2	20	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	607899	2	26	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	601274	2	26	7.6	5.0	✓
Conductivity in Water	E100	601271	2	35	5.7	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	606887	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	599145	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605280	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	601273	2	32	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	601276	2	27	7.4	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	601277	2	32	6.2	5.0	✓
pH by Meter	E108	601269	2	34	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	601278	2	26	7.6	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	605279	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	606410	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	600798	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605281	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	601270	2	33	6.0	5.0	✓
Ammonia by Fluorescence	E298	605277	1	20	5.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	601985	3	51	5.8	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	601275	2	20	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	607899	2	26	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	601274	2	26	7.6	5.0	✓
Conductivity in Water	E100	601271	2	35	5.7	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	606887	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	599145	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605280	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	601273	2	32	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	601276	2	27	7.4	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	601277	2	32	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	601278	2	26	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	605279	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	606410	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	600798	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605281	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	605277	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	601275	2	20	10.0	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	607899	2	26	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	601274	2	26	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	606887	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	599145	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605280	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	601273	2	32	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	601276	2	27	7.4	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	601277	2	32	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	601278	2	26	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	605279	1	13	7.6	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Total Mercury in Water by CVAAS	E508	606410	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	600798	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605281	1	11	9.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO ₃ .



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22B8570	Page	: 1 of 22
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton Surface Water	Date Samples Received	: 10-Aug-2022 22:00
PO	: ----	Date Analysis Commenced	: 13-Aug-2022
C-O-C number	: ----	Issue Date	: 19-Aug-2022 10:11
Sampler	: HS		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Inorganics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

Page : 2 of 22
Work Order : VA22B8570
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 601269)											
VA22B8605-004	Anonymous	pH	----	E108	0.10	pH units	7.39	7.41	0.270%	4%	----
Physical Tests (QC Lot: 601270)											
VA22B8605-004	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	12.8	13.3	3.83%	20%	----
Physical Tests (QC Lot: 601271)											
VA22B8605-004	Anonymous	conductivity	----	E100	2.0	µS/cm	63.3	63.5	0.315%	10%	----
Physical Tests (QC Lot: 601426)											
FJ2202119-003	Anonymous	pH	----	E108	0.10	pH units	8.41	8.41	0.00%	4%	----
Physical Tests (QC Lot: 601427)											
FJ2202119-003	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	309	310	0.0323%	20%	----
Physical Tests (QC Lot: 601428)											
FJ2202119-003	Anonymous	conductivity	----	E100	2.0	µS/cm	1450	1450	0.0690%	10%	----
Anions and Nutrients (QC Lot: 601273)											
VA22B8570-001	SW-05	fluoride	16984-48-8	E235.F	0.020	mg/L	0.036	0.035	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601274)											
VA22B8570-001	SW-05	chloride	16887-00-6	E235.Cl	0.50	mg/L	32.4	32.4	0.0487%	20%	----
Anions and Nutrients (QC Lot: 601275)											
VA22B8570-001	SW-05	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601276)											
VA22B8570-001	SW-05	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601277)											
VA22B8570-001	SW-05	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601278)											
VA22B8570-001	SW-05	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601429)											
FJ2202119-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601430)											
FJ2202119-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601431)											
FJ2202119-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601432)											
FJ2202119-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 601433)											
FJ2202119-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 601434)											
FJ2202119-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	254	256	0.657%	20%	----
Anions and Nutrients (QC Lot: 605277)											
FJ2202115-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	1.00	mg/L	236	247	4.55%	20%	----
Anions and Nutrients (QC Lot: 605279)											
FJ2202115-007	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.112	0.130	0.017	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 605280)											
VA22B8570-001	SW-05	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	35.6	39.0	8.91%	20%	----
Organic / Inorganic Carbon (QC Lot: 605281)											
VA22B8570-001	SW-05	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	31.9	32.9	3.23%	20%	----
Total Metals (QC Lot: 600798)											
VA22B8546-001	Anonymous	aluminum, total	7429-90-5	E420	0.0150	mg/L	0.115	0.117	0.0023	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00050	mg/L	0.0244	0.0236	3.23%	20%	----
		arsenic, total	7440-38-2	E420	0.00050	mg/L	0.0280	0.0277	1.14%	20%	----
		barium, total	7440-39-3	E420	0.00050	mg/L	0.0363	0.0347	4.29%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.050	mg/L	0.311	0.305	0.005	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000250	mg/L	0.000638	0.000621	2.70%	20%	----
		calcium, total	7440-70-2	E420	0.250	mg/L	407	402	1.29%	20%	----
		cesium, total	7440-46-2	E420	0.000050	mg/L	0.000764	0.000761	0.389%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	0.00054	<0.00050	0.00004	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00250	mg/L	0.00920	0.00895	0.00025	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.050	mg/L	0.107	0.106	0.001	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0050	mg/L	0.0087	0.0087	0.00002	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0250	mg/L	39.1	38.1	2.53%	20%	----
		manganese, total	7439-96-5	E420	0.00050	mg/L	0.0200	0.0188	6.11%	20%	----
		molybdenum, total	7439-98-7	E420	0.000250	mg/L	0.233	0.226	3.12%	20%	----
		nickel, total	7440-02-0	E420	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.250	mg/L	111	106	4.43%	20%	----
		rubidium, total	7440-17-7	E420	0.00100	mg/L	0.0625	0.0594	5.08%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 600798) - continued											
VA22B8546-001	Anonymous	selenium, total	7782-49-2	E420	0.000250	mg/L	0.0186	0.0182	2.02%	20%	----
		silicon, total	7440-21-3	E420	0.50	mg/L	5.38	5.35	0.504%	20%	----
		silver, total	7440-22-4	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.250	mg/L	1260	1220	2.93%	20%	----
		strontium, total	7440-24-6	E420	0.00100	mg/L	8.38	8.13	3.10%	20%	----
		sulfur, total	7704-34-9	E420	2.50	mg/L	1440	1380	3.82%	20%	----
		tellurium, total	13494-80-9	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00270	mg/L	<0.00270	<0.00270	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00050	mg/L	0.00270	0.00263	0.00007	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000050	mg/L	0.000680	0.000648	4.72%	20%	----
		vanadium, total	7440-62-2	E420	0.00250	mg/L	0.00596	0.00579	0.00017	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0150	mg/L	<0.0150	<0.0150	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Total Metals (QC Lot: 606410)											
KS2202952-009	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 599145)											
VA22B8546-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0300	0.0316	0.0015	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00050	mg/L	0.0246	0.0244	0.773%	20%	----
		arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.0290	0.0291	0.395%	20%	----
		barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0367	0.0367	0.00848%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.050	mg/L	0.364	0.366	0.002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.000110	mg/L	<0.000110	<0.000110	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.250	mg/L	422	434	2.70%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000050	mg/L	0.000796	0.000779	2.17%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00100	mg/L	0.00497	0.00469	0.00028	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0050	mg/L	0.0093	0.0094	0.00006	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 599145) - continued											
VA22B8546-001	Anonymous	magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	39.7	40.4	1.72%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00050	mg/L	0.0170	0.0170	0.248%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.229	0.230	0.0321%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.250	mg/L	108	108	0.603%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00100	mg/L	0.0618	0.0625	1.07%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000250	mg/L	0.0178	0.0191	6.77%	20%	----
		silicon, dissolved	7440-21-3	E421	0.250	mg/L	5.23	5.20	0.459%	20%	----
		silver, dissolved	7440-22-4	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.250	mg/L	1310	1310	0.360%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00100	mg/L	8.77	8.83	0.654%	20%	----
		sulfur, dissolved	7704-34-9	E421	2.50	mg/L	1460	1500	2.53%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00150	mg/L	<0.00150	<0.00150	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00050	mg/L	0.00271	0.00268	0.00003	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.000660	0.000643	2.56%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	0.00584	0.00553	0.00031	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 606887)											
VA22B8558-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 607899)											
KS2202900-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	61	65	3	Diff <2x LOR	----
Aggregate Organics (QC Lot: 607900)											
VA22B8570-003	SW-02	chemical oxygen demand [COD]	----	E559-L	10	mg/L	52	46	6	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 603603)											
VA22B8570-001	SW-05	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----

Page : 7 of 22
 Work Order : VA22B8570
 Client : Regional District of Kitimat-Stikine
 Project : Hazelton Surface Water



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Volatile Organic Compounds (QC Lot: 603603) - continued											
VA22B8570-001	SW-05	xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 603602)											
VA22B8570-001	SW-05	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 601270)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 601271)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 601427)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.2	----
Physical Tests (QCLot: 601428)						
conductivity	----	E100	1	µS/cm	1.4	----
Anions and Nutrients (QCLot: 601273)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 601274)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 601275)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 601276)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 601277)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 601278)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 601429)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 601430)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 601431)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 601432)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 601433)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 601434)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 605277)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 605279)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Organic / Inorganic Carbon (QCLot: 605280)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 605281)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 600798)						
aluminum, total	7429-90-5	E420	0.003	mg/L	# 0.0031	MB-LOR
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 600798) - continued						
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 606410)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 599145)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 599145) - continued						
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 606887)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 607899)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Aggregate Organics (QCLot: 607900)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 603603)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 601985)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 603602)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 605179)						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 605179) - continued						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	---
Hydrocarbons (QCLot: 605543)						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
TEH (C10-C30), BC	---	E601A	250	µg/L	<250	---

Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 601269)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 601270)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 601271)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.6	90.0	110	----
Physical Tests (QCLot: 601426)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 601427)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 601428)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	94.5	90.0	110	----
Anions and Nutrients (QCLot: 601273)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 601274)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 601275)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	92.4	85.0	115	----
Anions and Nutrients (QCLot: 601276)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 601277)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 601278)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 601429)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 601430)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 601431)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	95.6	85.0	115	----
Anions and Nutrients (QCLot: 601432)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 601433)									



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 601433) - continued									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 601434)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 605277)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.6	85.0	115	----
Anions and Nutrients (QCLot: 605279)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	92.7	75.0	125	----
Organic / Inorganic Carbon (QCLot: 605280)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.9	80.0	120	----
Organic / Inorganic Carbon (QCLot: 605281)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	107	80.0	120	----
Total Metals (QCLot: 600798)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	106	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	110	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	96.2	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	104	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	108	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	115	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 600798) - continued									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	109	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	114	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	90.4	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Total Metals (QCLot: 606410)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 599145)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	96.8	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	92.0	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	96.4	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	89.6	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	91.3	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.0	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	89.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	94.2	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	93.8	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	97.3	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	94.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	91.7	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	91.7	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.7	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	90.8	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	89.7	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Dissolved Metals (QCLot: 599145) - continued									
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.3	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	96.8	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	93.4	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	90.9	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	91.6	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	98.0	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	93.6	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	90.9	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	82.0	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	94.4	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	93.8	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	89.7	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	94.0	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	94.7	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	93.8	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	93.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	89.7	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	94.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	95.5	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.9	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	90.6	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	108	80.0	120	----
Aggregate Organics (QCLot: 607899)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	106	85.0	115	----
Aggregate Organics (QCLot: 607900)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	103	85.0	115	----
Volatile Organic Compounds (QCLot: 603603)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	92.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	96.0	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	93.0	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	90.8	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	97.9	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	94.3	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 601985)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	112	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	113	70.0	130	----
Hydrocarbons (QCLot: 603602)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	89.2	70.0	130	----
Hydrocarbons (QCLot: 605179)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	116	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	115	70.0	130	----
Hydrocarbons (QCLot: 605543)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	116	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	9202 µg/L	114	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 601273)										
VA22B8570-002	SW-21	fluoride	16984-48-8	E235.F	1.06 mg/L	1 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 601274)										
VA22B8570-002	SW-21	chloride	16887-00-6	E235.Cl	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 601275)										
VA22B8570-002	SW-21	bromide	24959-67-9	E235.Br-L	0.505 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 601276)										
VA22B8570-002	SW-21	nitrate (as N)	14797-55-8	E235.NO3-L	2.67 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 601277)										
VA22B8570-002	SW-21	nitrite (as N)	14797-65-0	E235.NO2-L	0.523 mg/L	0.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 601278)										
VA22B8570-002	SW-21	sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 601429)										
FJ2202119-002	Anonymous	fluoride	16984-48-8	E235.F	4.66 mg/L	5 mg/L	93.3	75.0	125	----
Anions and Nutrients (QCLot: 601430)										
FJ2202119-002	Anonymous	chloride	16887-00-6	E235.Cl	500 mg/L	500 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 601431)										
FJ2202119-002	Anonymous	bromide	24959-67-9	E235.Br-L	2.43 mg/L	2.5 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 601432)										
FJ2202119-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	12.6 mg/L	12.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 601433)										
FJ2202119-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.50 mg/L	2.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 601434)										
FJ2202119-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	494 mg/L	500 mg/L	98.8	75.0	125	----
Anions and Nutrients (QCLot: 605277)										
FJ2202115-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 605279)										
FJ2202115-008	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.48 mg/L	2.5 mg/L	99.0	70.0	130	----
Organic / Inorganic Carbon (QCLot: 605280)										



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 605280) - continued										
VA22B8570-002	SW-21	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 605281)										
VA22B8570-002	SW-21	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 600798)										
VA22B8546-002	Anonymous	aluminum, total	7429-90-5	E420	0.961 mg/L	1 mg/L	96.1	70.0	130	----
		antimony, total	7440-36-0	E420	0.0997 mg/L	0.1 mg/L	99.7	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0952 mg/L	0.1 mg/L	95.2	70.0	130	----
		barium, total	7440-39-3	E420	0.0918 mg/L	0.1 mg/L	91.8	70.0	130	----
		beryllium, total	7440-41-7	E420	0.187 mg/L	0.2 mg/L	93.3	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0434 mg/L	0.05 mg/L	86.7	70.0	130	----
		boron, total	7440-42-8	E420	0.420 mg/L	0.5 mg/L	84.0	70.0	130	----
		cadmium, total	7440-43-9	E420	0.0185 mg/L	0.02 mg/L	92.4	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0503 mg/L	0.05 mg/L	100	70.0	130	----
		chromium, total	7440-47-3	E420	0.191 mg/L	0.2 mg/L	95.6	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0924 mg/L	0.1 mg/L	92.4	70.0	130	----
		copper, total	7440-50-8	E420	0.0877 mg/L	0.1 mg/L	87.7	70.0	130	----
		iron, total	7439-89-6	E420	9.36 mg/L	10 mg/L	93.6	70.0	130	----
		lead, total	7439-92-1	E420	0.0876 mg/L	0.1 mg/L	87.6	70.0	130	----
		lithium, total	7439-93-2	E420	0.470 mg/L	0.5 mg/L	94.1	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	5 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0941 mg/L	0.1 mg/L	94.1	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.185 mg/L	0.2 mg/L	92.4	70.0	130	----
		phosphorus, total	7723-14-0	E420	51.5 mg/L	50 mg/L	103	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0940 mg/L	0.1 mg/L	94.0	70.0	130	----
		selenium, total	7782-49-2	E420	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		silicon, total	7440-21-3	E420	50.5 mg/L	50 mg/L	101	70.0	130	----
		silver, total	7440-22-4	E420	0.0190 mg/L	0.02 mg/L	94.9	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	100 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.207 mg/L	0.2 mg/L	103	70.0	130	----
		thallium, total	7440-28-0	E420	0.0173 mg/L	0.02 mg/L	86.7	70.0	130	----
		thorium, total	7440-29-1	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 600798) - continued										
VA22B8546-002	Anonymous	tin, total	7440-31-5	E420	0.0986 mg/L	0.1 mg/L	98.6	70.0	130	----
		titanium, total	7440-32-6	E420	0.198 mg/L	0.2 mg/L	98.9	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0942 mg/L	0.1 mg/L	94.2	70.0	130	----
		uranium, total	7440-61-1	E420	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		vanadium, total	7440-62-2	E420	0.488 mg/L	0.5 mg/L	97.6	70.0	130	----
		zinc, total	7440-66-6	E420	1.83 mg/L	2 mg/L	91.5	70.0	130	----
		zirconium, total	7440-67-7	E420	0.208 mg/L	0.2 mg/L	104	70.0	130	----
Total Metals (QCLot: 606410)										
KS2202952-010	Anonymous	mercury, total	7439-97-6	E508	0.0000993 mg/L	0.0001 mg/L	99.3	70.0	130	----
Dissolved Metals (QCLot: 599145)										
VA22B8546-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.999 mg/L	1 mg/L	99.9	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0976 mg/L	0.1 mg/L	97.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0980 mg/L	0.1 mg/L	98.0	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.197 mg/L	0.2 mg/L	98.5	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0429 mg/L	0.05 mg/L	85.8	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0507 mg/L	0.05 mg/L	101	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.186 mg/L	0.2 mg/L	92.8	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0922 mg/L	0.1 mg/L	92.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0881 mg/L	0.1 mg/L	88.1	70.0	130	----
		iron, dissolved	7439-89-6	E421	9.16 mg/L	10 mg/L	91.6	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0897 mg/L	0.1 mg/L	89.7	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.511 mg/L	0.5 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.183 mg/L	0.2 mg/L	91.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	50.1 mg/L	50 mg/L	100	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.207 mg/L	0.2 mg/L	104	70.0	130	----
		silicon, dissolved	7440-21-3	E421	48.7 mg/L	50 mg/L	97.3	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.0169 mg/L	0.02 mg/L	84.3	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 599145) - continued										
VA22B8546-002	Anonymous	sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.196 mg/L	0.2 mg/L	98.3	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.0176 mg/L	0.02 mg/L	87.9	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0960 mg/L	0.1 mg/L	96.0	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.190 mg/L	0.2 mg/L	95.0	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0948 mg/L	0.1 mg/L	94.8	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.503 mg/L	0.5 mg/L	101	70.0	130	----
		zinc, dissolved	7440-66-6	E421	1.87 mg/L	2 mg/L	93.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 606887)										
VA22B8558-002	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000740 mg/L	0.0001 mg/L	74.0	70.0	130	----
Aggregate Organics (QCLot: 607899)										
KS2202900-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	86 mg/L	100 mg/L	86.0	75.0	125	----
Aggregate Organics (QCLot: 607900)										
VA22B8570-004	SW-01	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----
Volatile Organic Compounds (QCLot: 603603)										
VA22B8570-001	SW-05	benzene	71-43-2	E611A	101 µg/L	100 µg/L	101	60.0	140	----
		ethylbenzene	100-41-4	E611A	98.0 µg/L	100 µg/L	98.0	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		styrene	100-42-5	E611A	94.6 µg/L	100 µg/L	94.6	60.0	140	----
		toluene	108-88-3	E611A	96.7 µg/L	100 µg/L	96.7	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	208 µg/L	200 µg/L	104	60.0	140	----
		xylene, o-	95-47-6	E611A	99.3 µg/L	100 µg/L	99.3	60.0	140	----
Hydrocarbons (QCLot: 603602)										
VA22B8570-002	SW-21	VHw (C6-C10)	----	E581.VH+F1	5380 µg/L	6310 µg/L	85.2	60.0	140	----

Qualifiers

Qualifier *Description*

MS-B *Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

Page : 22 of 22
Work Order : VA22B8570
Client : Regional District of Kitimat-Stikine
Project : Hazelton Surface Water





Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number

Environmental Division
Vancouver
Work Order Reference
VA22B8570



Telephone : +1 604 253 4188

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM																				
Company: Regional District of Kitimat-Stikine		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by																				
Contact: Hannah Shinton		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>			3 day [P3-25%] <input type="checkbox"/>			2 day [P2-50%] <input type="checkbox"/>			1 Business Day Same Date (Laboratory)											
Phone: 250-641-4141		<input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			Date and Time Required for all E&P TATs:																				
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			For tests that can not be performed according to the service level:																				
Street: 4545 Lazelle Avenue		Email 1 or Fax hshinton@rdks.bc.ca			Analysis																				
City/Province: Terrace/BC		Email 2 nlavoie@rdks.bc.ca			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																				
Postal Code: V8G4E1		Email 3 eblaney@rdks.bc.ca			P F/P F/P P P P P P P P P P P P P																				
Invoice To		Invoice Distribution																							
Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																							
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax anne-maries@rdks.bc.ca, nlavoie@rdks.bc.ca																							
Company: Regional District of Kitimat-Stikine		Email 2																							
Contact: Nicole Lavoie																									
Project Information				Oil and Gas Required Fields (client use)																					
ALS Account # / Quote #: VA-19-RDKS100-001				AFE/Cost Center:			PO#																		
Job #: Hazelton Surface Water				Major/Minor Code:			Routing Code:																		
PO / AFE:				Requisitioner:																					
LSD:				Location:																					
ALS Lab Work Order # (lab use only):				ALS Contact:			Sampler:			H. Shinton															
ALS Sample # (lab use only)	Sample Identification and/or Cr (This description will appear on)			Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals	Dissolved Metals	Alkalinity	Dissolved Organic Carbon	Chloride, Fluoride, sulphate, hardness	Ammonia	Nitrate	Nitrite	Total Kjeldahl Nitrogen	TOC	pH	COD	Conductivity	EPH	BTEX / VPH	SAMPLES ON HOLD	Sample is hazardous (please provide further detail)	NUMBER OF CONTAINERS	
SW-05	AUG 5 2022			14:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10
SW-21	AUG 5 2022			12:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10
SW-02	AUG 5 2022			10:55	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10
SW-01	AUG 5 2022			10:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10
SW-09	AUG 5 2022			12:07	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10
Travel Blank	AUG 5				Water	R						R					R		R						4
Field Blank	AUG 5			16:11	Water	R	R					R	R						R	R	R				10
Drinking Water (DW) Samples¹ (client use)				Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)									SAMPLE CONDITION AS RECEIVED (lab use only)												
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)									Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>												
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO													Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>												
													Cooling Initiated <input type="checkbox"/>												
													INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C							
													6.3 9.8					3 (Avg of 2 cool)							
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)									FINAL SHIPMENT RECEPTION (lab use only)												
Released by: N. LAVOIE		Date: Aug 10 2022		Time:		Received by: Chris		Date: 10 Aug 22		Time: 1045		Received by: RJ		Date: Aug-10		Time: 2200									

Terrace Shipping
2 Coolers Ground
1 Carboys Air SFX

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order : **VA22B5770**
Client : **Regional District of Kitimat-Stikine**
Contact : Hannah Shinton
Address : # 300 - 4545 Lazelle Avenue
 Terrace BC Canada V8G 4E1
Telephone : ----
Project : Hazelton WMF Treated Leachate at Wetland 4
PO : ----
C-O-C number : ----
Sampler : H. Shinton
Site :
Quote number : Default Water Testing (Q62338)
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Vancouver - Environmental
Account Manager : Amber Springer
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 08-Jul-2022 13:00
Date Analysis Commenced : 11-Jul-2022
Issue Date : 22-Jul-2022 17:30

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Anthony Calero	Team Leader - Inorganics	Organics, Calgary, Alberta
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Nguyen Tran	Laboratory Analyst	Organics, Calgary, Alberta
Parnian Sane	Analyst	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
RRV	Reported result verified by repeat analysis.



Analytical Results

Sub-Matrix: Effluent

Client sample ID

(Matrix: Water)

					Wetland 4 @ Outlet	SW-21	Travel Blank	Field Blank	----
					06-Jul-2022 01:17	06-Jul-2022 12:00	06-Jul-2022	06-Jul-2022 14:02	----
Analyte	CAS Number	Method	LOR	Unit	VA22B5770-001	VA22B5770-002	VA22B5770-003	VA22B5770-004	-----
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	322	339	<1.0	<1.0	----
conductivity	----	E100	2.0	µS/cm	752	774	----	<2.0	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	293	291	<0.60	<0.60	----
pH	----	E108	0.10	pH units	8.32	8.34	----	5.69	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	1.32	1.47	0.0075 ^{RRV}	<0.0050	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	64.2	63.3	<0.50	<0.50	----
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.100 ^{DLDS}	<0.100 ^{DLDS}	<0.020	<0.020	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	2.92	2.67	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.167	0.164	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0282	0.0283	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	2.46	2.68	<0.030	<0.030	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0055	0.0064	<0.0010	<0.0010	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<1.50 ^{DLDS}	<1.50 ^{DLDS}	<0.30	<0.30	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	15.3	15.7	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	15.5	16.1	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0282	0.0124	<0.0030	<0.0030	----
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00039	0.00037	<0.00010	<0.00010	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00842	0.00867	<0.00010	<0.00010	----
barium, total	7440-39-3	E420	0.00010	mg/L	0.0775	0.0811	<0.00010	<0.00010	----
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	<0.000100	<0.000100	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
boron, total	7440-42-8	E420	0.010	mg/L	0.528	0.533	<0.010	<0.010	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000108	0.0000077	<0.0000050	<0.0000050	----
calcium, total	7440-70-2	E420	0.050	mg/L	82.2	81.3	<0.050	<0.050	----
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000033	0.000026	<0.000010	<0.000010	----
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00060	0.00050	<0.00050	<0.00050	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00079	0.00076	<0.00010	<0.00010	----
copper, total	7440-50-8	E420	0.00050	mg/L	0.00063	<0.00050	<0.00050	<0.00050	----



Analytical Results

Sub-Matrix: Effluent

Client sample ID

(Matrix: Water)

					Wetland 4 @ Outlet	SW-21	Travel Blank	Field Blank	----	
					06-Jul-2022 01:17	06-Jul-2022 12:00	06-Jul-2022	06-Jul-2022 14:02	----	
Analyte	CAS Number	Method	LOR	Unit	Client sampling date / time	VA22B5770-001	VA22B5770-002	VA22B5770-003	VA22B5770-004	-----
						Result	Result	Result	Result	----
Total Metals										
iron, total	7439-89-6	E420	0.010	mg/L		0.684	0.684	<0.010	<0.010	----
lead, total	7439-92-1	E420	0.000050	mg/L		0.000050	<0.000050	<0.000050	<0.000050	----
lithium, total	7439-93-2	E420	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
magnesium, total	7439-95-4	E420	0.0050	mg/L		21.3	21.3	<0.0050	<0.0050	----
manganese, total	7439-96-5	E420	0.00010	mg/L		1.38	1.43	<0.00010	<0.00010	----
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.00170	0.00150	<0.000050	<0.000050	----
nickel, total	7440-02-0	E420	0.00050	mg/L		0.00503	0.00490	<0.00050	<0.00050	----
phosphorus, total	7723-14-0	E420	0.050	mg/L		0.051	0.057	<0.050	<0.050	----
potassium, total	7440-09-7	E420	0.050	mg/L		13.3	13.3	<0.050	<0.050	----
rubidium, total	7440-17-7	E420	0.00020	mg/L		0.00238	0.00237	<0.00020	<0.00020	----
selenium, total	7782-49-2	E420	0.000050	mg/L		0.000088	0.000080	<0.000050	<0.000050	----
silicon, total	7440-21-3	E420	0.10	mg/L		4.72	4.81	<0.10	<0.10	----
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
sodium, total	7440-23-5	E420	0.050	mg/L		61.5	61.1	<0.050	<0.050	----
strontium, total	7440-24-6	E420	0.00020	mg/L		0.607	0.589	<0.00020	<0.00020	----
sulfur, total	7704-34-9	E420	0.50	mg/L		0.83	0.75	<0.50	<0.50	----
tellurium, total	13494-80-9	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
thorium, total	7440-29-1	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
titanium, total	7440-32-6	E420	0.00030	mg/L		0.00053	<0.00030	<0.00030	<0.00030	----
tungsten, total	7440-33-7	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
uranium, total	7440-61-1	E420	0.000010	mg/L		0.000246	0.000244	<0.000010	<0.000010	----
vanadium, total	7440-62-2	E420	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, total	7440-66-6	E420	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	----
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Aggregate Organics										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L		2.8	2.9	----	<2.0	----
chemical oxygen demand [COD]	----	E559-L	10	mg/L		62	53	----	----	----
Volatile Organic Compounds [Fuels]										
benzene	71-43-2	E611A	0.50	µg/L		<0.50	<0.50	----	<0.50	----



Analytical Results

Sub-Matrix: Effluent

(Matrix: Water)

					Client sample ID	Wetland 4 @ Outlet	SW-21	Travel Blank	Field Blank	----
					Client sampling date / time	06-Jul-2022 01:17	06-Jul-2022 12:00	06-Jul-2022	06-Jul-2022 14:02	----
Analyte	CAS Number	Method	LOR	Unit	VA22B5770-001	VA22B5770-002	VA22B5770-003	VA22B5770-004	-----	-----
					Result	Result	Result	Result	-----	-----
Volatile Organic Compounds [Fuels]										
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	102	89.9	----	90.2	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	94.2	94.0	----	95.0	----	----
Hydrocarbons										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	<250	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	<100	----	----
EPH (C10-C32)	----	E601A	400	µg/L	<400	<400	----	<400	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	<250	----	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	<250	----	<250	----	----
VPHw	----	EC580A	100	µg/L	<100	<100	----	<100	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	80.0	74.9	----	74.3	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	110	105	----	106	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B5770	Page	: 1 of 16
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 08-Jul-2022 13:00
PO	: ----	Issue Date	: 22-Jul-2022 17:30
C-O-C number	: ----		
Sampler	: H. Shinton		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Field Blank	E550	06-Jul-2022	----	----	----		11-Jul-2022	3 days	5 days	* EHT
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] SW-21	E550	06-Jul-2022	----	----	----		11-Jul-2022	3 days	5 days	* EHT
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT 3d] Wetland 4 @ Outlet	E550	06-Jul-2022	----	----	----		11-Jul-2022	3 days	6 days	* EHT
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) SW-21	E559-L	06-Jul-2022	----	----	----		18-Jul-2022	28 days	12 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E559-L	06-Jul-2022	----	----	----		18-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Field Blank	E298	06-Jul-2022	14-Jul-2022	----	----		20-Jul-2022	28 days	14 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW-21	E298	06-Jul-2022	14-Jul-2022	----	----		20-Jul-2022	28 days	14 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Travel Blank	E298	06-Jul-2022	14-Jul-2022	----	----		20-Jul-2022	28 days	14 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E298	06-Jul-2022	14-Jul-2022	----	----		20-Jul-2022	28 days	14 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Field Blank	E235.CI	06-Jul-2022	----	----	----		11-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Travel Blank	E235.CI	06-Jul-2022	----	----	----		12-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-21	E235.CI	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Wetland 4 @ Outlet	E235.CI	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Field Blank	E378-U	06-Jul-2022	----	----	----		11-Jul-2022	3 days	5 days	* EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE SW-21	E378-U	06-Jul-2022	----	----	----		11-Jul-2022	3 days	5 days	* EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Travel Blank	E378-U	06-Jul-2022	----	----	----		11-Jul-2022	3 days	5 days	* EHT



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Wetland 4 @ Outlet	E378-U	06-Jul-2022	----	----	----		11-Jul-2022	3 days	6 days	* EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE Field Blank	E235.F	06-Jul-2022	----	----	----		11-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Travel Blank	E235.F	06-Jul-2022	----	----	----		12-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-21	E235.F	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Wetland 4 @ Outlet	E235.F	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SW-21	E235.NO3-L	06-Jul-2022	----	----	----		12-Jul-2022	3 days	6 days	* EHT
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Wetland 4 @ Outlet	E235.NO3-L	06-Jul-2022	----	----	----		12-Jul-2022	3 days	6 days	* EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE SW-21	E235.NO2-L	06-Jul-2022	----	----	----		12-Jul-2022	3 days	6 days	* EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Wetland 4 @ Outlet	E235.NO2-L	06-Jul-2022	----	----	----		12-Jul-2022	3 days	6 days	* EHT



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Sulfate in Water by IC										
HDPE Field Blank	E235.SO4	06-Jul-2022	----	----	----		11-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Travel Blank	E235.SO4	06-Jul-2022	----	----	----		12-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW-21	E235.SO4	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Wetland 4 @ Outlet	E235.SO4	06-Jul-2022	----	----	----		12-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) SW-21	E318	06-Jul-2022	14-Jul-2022	----	----		21-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E318	06-Jul-2022	14-Jul-2022	----	----		21-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Field Blank	E366	06-Jul-2022	14-Jul-2022	----	----		15-Jul-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) SW-21	E366	06-Jul-2022	14-Jul-2022	----	----		15-Jul-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Travel Blank	E366	06-Jul-2022	14-Jul-2022	----	----		15-Jul-2022	28 days	9 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Total Nitrogen by Colourimetry											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E366	06-Jul-2022	14-Jul-2022	----	----		15-Jul-2022	28 days	9 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Field Blank	E601A	06-Jul-2022	19-Jul-2022	14 days	13 days	✓	20-Jul-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) SW-21	E601A	06-Jul-2022	19-Jul-2022	14 days	13 days	✓	20-Jul-2022	40 days	1 days	✓	
Hydrocarbons : BC PHCs - EPH by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) Wetland 4 @ Outlet	E601A	06-Jul-2022	19-Jul-2022	14 days	14 days	✓	20-Jul-2022	40 days	1 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Field Blank	E581.VH+F1	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) SW-21	E581.VH+F1	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓	
Hydrocarbons : VH and F1 by Headspace GC-FID											
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E581.VH+F1	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) SW-21	E358-L	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)											
Amber glass dissolved (sulfuric acid) Wetland 4 @ Outlet	E358-L	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	28 days	8 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) SW-21	E355-L	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	28 days	8 days	✓	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)											
Amber glass total (sulfuric acid) Wetland 4 @ Outlet	E355-L	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	28 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Field Blank	E290	06-Jul-2022	----	----	----		13-Jul-2022	14 days	7 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE SW-21	E290	06-Jul-2022	----	----	----		14-Jul-2022	14 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Travel Blank	E290	06-Jul-2022	----	----	----		14-Jul-2022	14 days	8 days	✓	
Physical Tests : Alkalinity Species by Titration											
HDPE Wetland 4 @ Outlet	E290	06-Jul-2022	----	----	----		14-Jul-2022	14 days	9 days	✓	
Physical Tests : Conductivity in Water											
HDPE Field Blank	E100	06-Jul-2022	----	----	----		13-Jul-2022	28 days	7 days	✓	
Physical Tests : Conductivity in Water											
HDPE SW-21	E100	06-Jul-2022	----	----	----		14-Jul-2022	28 days	8 days	✓	
Physical Tests : Conductivity in Water											
HDPE Wetland 4 @ Outlet	E100	06-Jul-2022	----	----	----		14-Jul-2022	28 days	9 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter											
HDPE Field Blank	E108	06-Jul-2022	----	----	----		13-Jul-2022	0.25 hrs	173 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE SW-21	E108	06-Jul-2022	----	----	----		14-Jul-2022	0.25 hrs	199 hrs	*	EHTR-FM
Physical Tests : pH by Meter											
HDPE Wetland 4 @ Outlet	E108	06-Jul-2022	----	----	----		14-Jul-2022	0.25 hrs	210 hrs	*	EHTR-FM
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Field Blank	E508	06-Jul-2022	----	----	----		21-Jul-2022	28 days	15 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) SW-21	E508	06-Jul-2022	----	----	----		21-Jul-2022	28 days	15 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Travel Blank	E508	06-Jul-2022	----	----	----		21-Jul-2022	28 days	15 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Wetland 4 @ Outlet	E508	06-Jul-2022	----	----	----		21-Jul-2022	28 days	15 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Field Blank	E420	06-Jul-2022	----	----	----		17-Jul-2022	180 days	11 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) SW-21	E420	06-Jul-2022	----	----	----		17-Jul-2022	180 days	11 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Travel Blank	E420	06-Jul-2022	----	----	----		17-Jul-2022	180 days	11 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Wetland 4 @ Outlet	E420	06-Jul-2022	----	----	----		17-Jul-2022	180 days	11 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Field Blank	E611A	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-21	E611A	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Wetland 4 @ Outlet	E611A	06-Jul-2022	14-Jul-2022	----	----		14-Jul-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	557799	2	30	6.6	5.0	✓
Ammonia by Fluorescence	E298	562077	1	18	5.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	557974	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	562001	1	16	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	567317	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	557806	2	22	9.0	5.0	✓
Conductivity in Water	E100	557801	2	25	8.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	562078	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	557809	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	557805	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	558194	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	558195	1	18	5.5	5.0	✓
pH by Meter	E108	557800	2	25	8.0	5.0	✓
Sulfate in Water by IC	E235.SO4	557802	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	562073	1	10	10.0	5.0	✓
Total Mercury in Water by CVAAS	E508	571455	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	561941	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	562075	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	562074	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	562003	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	557799	2	30	6.6	5.0	✓
Ammonia by Fluorescence	E298	562077	1	18	5.5	5.0	✓
BC PHCs - EPH by GC-FID	E601A	568227	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	557974	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	562001	1	16	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	567317	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	557806	2	22	9.0	5.0	✓
Conductivity in Water	E100	557801	2	25	8.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	562078	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	557809	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	557805	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	558194	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	558195	1	18	5.5	5.0	✓
pH by Meter	E108	557800	2	25	8.0	5.0	✓
Sulfate in Water by IC	E235.SO4	557802	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	562073	1	10	10.0	5.0	✓



Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Mercury in Water by CVAAS	E508	571455	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	561941	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	562075	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	562074	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	562003	1	3	33.3	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	557799	2	30	6.6	5.0	✓
Ammonia by Fluorescence	E298	562077	1	18	5.5	5.0	✓
BC PHCs - EPH by GC-FID	E601A	568227	1	20	5.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	557974	1	5	20.0	5.0	✓
BTEX by Headspace GC-MS	E611A	562001	1	16	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	567317	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	557806	2	22	9.0	5.0	✓
Conductivity in Water	E100	557801	2	25	8.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	562078	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	557809	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	557805	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	558194	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	558195	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	557802	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	562073	1	10	10.0	5.0	✓
Total Mercury in Water by CVAAS	E508	571455	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	561941	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	562075	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	562074	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	562003	1	3	33.3	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	562077	1	18	5.5	5.0	✓
BTEX by Headspace GC-MS	E611A	562001	1	16	6.2	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	567317	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	557806	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	562078	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	557809	2	24	8.3	5.0	✓
Fluoride in Water by IC	E235.F	557805	2	30	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	558194	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	558195	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	557802	2	30	6.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	562073	1	10	10.0	5.0	✓
Total Mercury in Water by CVAAS	E508	571455	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	561941	1	20	5.0	5.0	✓



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	562075	1	12	8.3	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	562074	1	19	5.2	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
VH and F1 by Headspace GC-FID	E581.VH+F1 Calgary - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BC PHCs - EPH by GC-FID	E601A Calgary - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Calgary - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
VPH: VH-BTEX-Styrene	EC580A Calgary - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
VOCs Preparation for Headspace Analysis	EP581 Calgary - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Calgary - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: VA22B5770	Page	: 1 of 15
Client	: Regional District of Kitimat-Stikine	Laboratory	: Vancouver - Environmental
Contact	: Hannah Shinton	Account Manager	: Amber Springer
Address	: # 300 - 4545 Lazelle Avenue Terrace BC Canada V8G 4E1	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ---	Telephone	: +1 604 253 4188
Project	: Hazelton WMF Treated Leachate at Wetland 4	Date Samples Received	: 08-Jul-2022 13:00
PO	: ---	Date Analysis Commenced	: 11-Jul-2022
C-O-C number	: ---	Issue Date	: 22-Jul-2022 17:30
Sampler	: H. Shinton		
Site	:		
Quote number	: Default Water Testing (Q62338)		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Anthony Calero	Team Leader - Inorganics	Calgary Organics, Calgary, Alberta
Brianna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Nguyen Tran	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia

Page : 2 of 15
Work Order : VA22B5770
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 557799)											
VA22B5758-003	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	117	114	2.16%	20%	----
Physical Tests (QC Lot: 557800)											
VA22B5767-001	Anonymous	pH	----	E108	0.10	pH units	8.22	8.23	0.122%	4%	----
Physical Tests (QC Lot: 557801)											
VA22B5767-001	Anonymous	conductivity	----	E100	2.0	µS/cm	227	226	0.442%	10%	----
Physical Tests (QC Lot: 558188)											
VA22B5770-001	Wetland 4 @ Outlet	pH	----	E108	0.10	pH units	8.32	8.33	0.0841%	4%	----
Physical Tests (QC Lot: 558189)											
VA22B5770-001	Wetland 4 @ Outlet	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	322	322	0.0310%	20%	----
Physical Tests (QC Lot: 558190)											
VA22B5770-001	Wetland 4 @ Outlet	conductivity	----	E100	2.0	µS/cm	752	760	1.06%	10%	----
Anions and Nutrients (QC Lot: 557802)											
VA22B5758-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	29.0	29.0	0.148%	20%	----
Anions and Nutrients (QC Lot: 557805)											
VA22B5758-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.061	0.059	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 557806)											
VA22B5758-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 557809)											
VA22B5770-004	Field Blank	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 558191)											
VA22B5784-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.034	0.037	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 558192)											
VA22B5784-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	6.12	6.23	1.87%	20%	----
Anions and Nutrients (QC Lot: 558194)											
VA22B5784-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0436	0.0431	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 558195)											
VA22B5784-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 558196)											
VA22B5784-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.37	3.42	1.20%	20%	----
Anions and Nutrients (QC Lot: 558198)											
VA22B5770-001	Wetland 4 @ Outlet	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0055	0.0065	0.0010	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 562073)											
VA22B5640-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 562075)											
VA22B5640-002	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 562077)											
VA22B5640-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0063	0.0068	0.0005	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 562074)											
VA22B5640-002	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 562078)											
VA22B5770-001	Wetland 4 @ Outlet	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	15.3	15.5	1.06%	20%	----
Total Metals (QC Lot: 561941)											
VA22B5766-014	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0175	0.0177	0.0003	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00016	0.00015	0.00001	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0493	0.0493	0.0482%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000060	<0.0000050	0.0000010	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	10.7	10.7	0.113%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.000050	mg/L	0.00282	0.00285	0.00004	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.014	0.015	0.0006	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	1.21	1.24	2.05%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00090	0.00091	0.00001	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00129	0.00125	2.59%	20%	----
		nickel, total	7440-02-0	E420	0.000050	mg/L	<0.000050	0.000052	0.00002	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.121	0.120	0.002	Diff <2x LOR	----
		rubidium, total	7440-17-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000210	0.000226	0.000017	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	2.67	2.71	1.66%	20%	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 561941) - continued											
VA22B5766-014	Anonymous	silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	0.858	0.871	1.53%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0832	0.0828	0.472%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	2.03	1.79	0.23	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00039	0.00045	0.00006	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000030	0.000025	0.000004	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 571455)											
VA22B5770-001	Wetland 4 @ Outlet	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 557974)											
VA22B5770-004	Field Blank	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 567317)											
FJ2201856-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	14	14	1.0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 562001)											
CG2209085-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 562003)											
VA22B5770-001	Wetland 4 @ Outlet	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 557799)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.1	----
Physical Tests (QCLot: 557801)						
conductivity	----	E100	1	µS/cm	1.5	----
Physical Tests (QCLot: 558189)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 558190)						
conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 557802)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 557805)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 557806)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 557809)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 558191)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 558192)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 558194)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 558195)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 558196)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 558198)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 562073)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 562075)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 562077)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 562074)						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 562078)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 561941)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 561941) - continued						
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 571455)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 557974)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 567317)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 562001)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 562003)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 568227)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
TEH (C10-C30), BC	----	E601A	250	µg/L	<250	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 557799)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Physical Tests (QCLot: 557800)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 557801)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 558188)									
pH	----	E108	----	pH units	7 pH units	99.9	98.0	102	----
Physical Tests (QCLot: 558189)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 558190)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.7	90.0	110	----
Anions and Nutrients (QCLot: 557802)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 557805)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 557806)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 557809)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	98.5	80.0	120	----
Anions and Nutrients (QCLot: 558191)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	93.4	90.0	110	----
Anions and Nutrients (QCLot: 558192)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 558194)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 558195)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100.0	90.0	110	----
Anions and Nutrients (QCLot: 558196)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 558198)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	95.0	80.0	120	----
Anions and Nutrients (QCLot: 562073)									



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Anions and Nutrients (QCLot: 562073) - continued									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.4	75.0	125	----
Anions and Nutrients (QCLot: 562075)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 562077)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 562074)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	93.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 562078)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.0	80.0	120	----
Total Metals (QCLot: 561941)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.8	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.9	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.1	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	99.3	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.3	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.3	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	103	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	99.6	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 561941) - continued									
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.8	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	96.7	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	101	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	93.9	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	96.0	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.1	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	97.8	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	100	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	98.7	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	93.6	80.0	120	----
Total Metals (QCLot: 571455)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.6	80.0	120	----
Aggregate Organics (QCLot: 557974)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	85.6	85.0	115	----
Aggregate Organics (QCLot: 567317)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	112	85.0	115	----
Volatile Organic Compounds (QCLot: 562001)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	128	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	107	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	110	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	113	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	114	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	111	70.0	130	----
Hydrocarbons (QCLot: 562003)									
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	115	70.0	130	----
Hydrocarbons (QCLot: 568227)									
EPH (C10-C19)	----	E601A	250	µg/L	6638.596 µg/L	98.9	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3614.035 µg/L	96.3	70.0	130	----
TEH (C10-C30), BC	----	E601A	250	µg/L	10238.59 µg/L	90.6	70.0	130	----

Page : 12 of 15
Work Order : VA22B5770
Client : Regional District of Kitimat-Stikine
Project : Hazelton WMF Treated Leachate at Wetland 4





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1x$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 557802)										
VA22B5758-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	107 mg/L	100 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 557805)										
VA22B5758-002	Anonymous	fluoride	16984-48-8	E235.F	1.04 mg/L	1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 557806)										
VA22B5758-002	Anonymous	chloride	16887-00-6	E235.Cl	107 mg/L	100 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 557809)										
VA22B5777-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0367 mg/L	0.03 mg/L	122	70.0	130	----
Anions and Nutrients (QCLot: 558191)										
VA22B5784-002	Anonymous	fluoride	16984-48-8	E235.F	0.943 mg/L	1 mg/L	94.3	75.0	125	----
Anions and Nutrients (QCLot: 558192)										
VA22B5784-002	Anonymous	chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 558194)										
VA22B5784-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.56 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 558195)										
VA22B5784-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.482 mg/L	0.5 mg/L	96.4	75.0	125	----
Anions and Nutrients (QCLot: 558196)										
VA22B5784-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 558198)										
VA22B5770-002	SW-21	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0382 mg/L	0.03 mg/L	127	70.0	130	----
Anions and Nutrients (QCLot: 562073)										
VA22B5648-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.59 mg/L	2.5 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 562075)										
VA22B5648-001	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 562077)										
VA22B5648-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Organic / Inorganic Carbon (QCLot: 562074)										
VA22B5648-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.16 mg/L	5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 562078)										



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 562078) - continued										
VA22B5770-002	SW-21	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 561941)										
VA22B5766-015	Anonymous	aluminum, total	7429-90-5	E420	0.184 mg/L	0.2 mg/L	91.9	70.0	130	----
		antimony, total	7440-36-0	E420	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00989 mg/L	0.01 mg/L	98.9	70.0	130	----
		boron, total	7440-42-8	E420	0.099 mg/L	0.1 mg/L	99.4	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00384 mg/L	0.004 mg/L	96.0	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00967 mg/L	0.01 mg/L	96.7	70.0	130	----
		chromium, total	7440-47-3	E420	0.0389 mg/L	0.04 mg/L	97.3	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		copper, total	7440-50-8	E420	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		iron, total	7439-89-6	E420	1.93 mg/L	2 mg/L	96.4	70.0	130	----
		lead, total	7439-92-1	E420	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		lithium, total	7439-93-2	E420	0.0974 mg/L	0.1 mg/L	97.4	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		nickel, total	7440-02-0	E420	0.0384 mg/L	0.04 mg/L	96.1	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.14 mg/L	10 mg/L	91.4	70.0	130	----
		potassium, total	7440-09-7	E420	3.75 mg/L	4 mg/L	93.8	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.0384 mg/L	0.04 mg/L	96.1	70.0	130	----
		silicon, total	7440-21-3	E420	9.01 mg/L	10 mg/L	90.1	70.0	130	----
		silver, total	7440-22-4	E420	0.00387 mg/L	0.004 mg/L	96.8	70.0	130	----
		sodium, total	7440-23-5	E420	1.94 mg/L	2 mg/L	97.1	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	19.0 mg/L	20 mg/L	95.0	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0365 mg/L	0.04 mg/L	91.3	70.0	130	----
		thallium, total	7440-28-0	E420	0.00379 mg/L	0.004 mg/L	94.7	70.0	130	----
		thorium, total	7440-29-1	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E420	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		titanium, total	7440-32-6	E420	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 561941) - continued										
VA22B5766-015	Anonymous	tungsten, total	7440-33-7	E420	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		uranium, total	7440-61-1	E420	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0966 mg/L	0.1 mg/L	96.6	70.0	130	----
		zinc, total	7440-66-6	E420	0.387 mg/L	0.4 mg/L	96.8	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
Total Metals (QCLot: 571455)										
VA22B5770-002	SW-21	mercury, total	7439-97-6	E508	0.000110 mg/L	0.0001 mg/L	110	70.0	130	----
Aggregate Organics (QCLot: 567317)										
FJ2201856-002	Anonymous	chemical oxygen demand [COD]	----	E559-L	110 mg/L	100 mg/L	110	75.0	125	----
Volatile Organic Compounds (QCLot: 562001)										
CG2209085-001	Anonymous	benzene	71-43-2	E611A	126 µg/L	100 µg/L	126	70.0	130	----
		ethylbenzene	100-41-4	E611A	100 µg/L	100 µg/L	100	70.0	130	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	105 µg/L	100 µg/L	105	70.0	130	----
		styrene	100-42-5	E611A	105 µg/L	100 µg/L	105	70.0	130	----
		toluene	108-88-3	E611A	109 µg/L	100 µg/L	109	70.0	130	----
		xylene, m+p-	179601-23-1	E611A	218 µg/L	200 µg/L	109	70.0	130	----
		xylene, o-	95-47-6	E611A	106 µg/L	100 µg/L	106	70.0	130	----



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here

(lab use only)

COC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: Regional District of Kitimat-Stikine Contact: Hannah Shinton Phone: 250-641-4141 Company address below will appear on the final report Street: 4545 Lazelle Avenue City/Province: Terrace/BC Postal Code: V8G4E1		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: hshinton@rdks.bc.ca Email 2: nlavoi@rdks.bc.ca Email 3: eblaney@rdks.bc.ca;		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply Emergency [E] <input type="checkbox"/> 1 Business day [E1 - 100%] Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs: _____ For tests that can not be performed according to the service level selected, you will be contacted.																																																																																											
Invoice To Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Company: Regional District of Kitimat-Stikine Contact: Nicole Lavoie		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: anne-maries@rdks.bc.ca Email 2: hshinton@rdks.bc.ca, nlavoi@rdks.bc.ca		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <tr> <td>P</td><td></td><td></td><td></td><td></td><td>P</td><td></td><td>F/P</td><td>P</td><td></td><td>P</td><td>F/P</td><td>P</td><td>P</td><td>P</td> </tr> <tr> <td>Total Metals</td><td>Alkalinity</td><td>Chloride, Fluoride, Sulphate, Hardness</td><td>Total Nitrogen</td><td>Ammonia</td><td>Nitrate, Nitrite</td><td>Dissolved Organic Carbon</td><td>TOC</td><td>Orthophosphorus</td><td>COD</td><td>DOC</td><td>BOD, Conductivity, pH</td><td>Total Kjeldahl Nitrogen</td><td>EPH</td><td>BTEX/VPH</td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td>R</td><td></td><td>R</td><td>R</td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td>R</td><td></td><td>R</td><td>R</td> </tr> </table>		P					P		F/P	P		P	F/P	P	P	P	Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	DOC	BOD, Conductivity, pH	Total Kjeldahl Nitrogen	EPH	BTEX/VPH	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				R			R		R	R	R	R	R	R	R				R			R		R	R
P					P		F/P	P		P	F/P	P	P	P																																																																																	
Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	DOC	BOD, Conductivity, pH	Total Kjeldahl Nitrogen	EPH	BTEX/VPH																																																																																	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																	
R	R	R	R	R				R			R		R	R																																																																																	
R	R	R	R	R				R			R		R	R																																																																																	
Project Information ALS Account # / Quote #: _____ Job #: Hazelton WMF Treated Leachate at Wetland 4 PO / AFE: _____ LSD: _____		Oil and Gas Required Fields (client use) AFE/Cost Center: _____ PO#: _____ Major/Minor Code: _____ Routing Code: _____ Requisitioner: _____ Location: _____		ALS Lab Work Order # (lab use only): 5770 ALS Contact: _____ Sampler: H. Shinton																																																																																											
ALS Sample # (lab use only) 1 2 3 4	Sample Identification and/or Coordinates (This description will appear on the report) Wetland 4 @ Outlet SW-21 Travel Blank Field Blank	Date (dd-mm-yy) 6-Jul-22 6-Jul-22 6-Jul-22 6-Jul-22	Time (hh:mm) 13:17 12:00 - 14:02	Sample Type Effluent Effluent Water Water	<table border="1"> <tr> <td>Total Metals</td><td>Alkalinity</td><td>Chloride, Fluoride, Sulphate, Hardness</td><td>Total Nitrogen</td><td>Ammonia</td><td>Nitrate, Nitrite</td><td>Dissolved Organic Carbon</td><td>TOC</td><td>Orthophosphorus</td><td>COD</td><td>DOC</td><td>BOD, Conductivity, pH</td><td>Total Kjeldahl Nitrogen</td><td>EPH</td><td>BTEX/VPH</td><td>SAMPLES ON HOLD</td><td>NUMBER OF CONTAINERS</td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td>R</td><td></td><td>R</td><td>R</td><td></td><td></td> </tr> <tr> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td></td><td></td><td></td><td>R</td><td></td><td></td><td>R</td><td></td><td>R</td><td>R</td><td></td><td></td> </tr> </table>	Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	DOC	BOD, Conductivity, pH	Total Kjeldahl Nitrogen	EPH	BTEX/VPH	SAMPLES ON HOLD	NUMBER OF CONTAINERS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			R	R	R	R	R				R			R		R	R			R	R	R	R	R				R			R		R	R							
Total Metals	Alkalinity	Chloride, Fluoride, Sulphate, Hardness	Total Nitrogen	Ammonia	Nitrate, Nitrite	Dissolved Organic Carbon	TOC	Orthophosphorus	COD	DOC	BOD, Conductivity, pH	Total Kjeldahl Nitrogen	EPH	BTEX/VPH	SAMPLES ON HOLD	NUMBER OF CONTAINERS																																																																															
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																	
R	R	R	R	R	R	R	R	R	R	R	R	R	R	R																																																																																	
R	R	R	R	R				R			R		R	R																																																																																	
R	R	R	R	R				R			R		R	R																																																																																	
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)		Terrace Shipping # _____ Coolers Ground <input type="checkbox"/> # _____ Carboys Air <input checked="" type="checkbox"/> SFX <input type="checkbox"/>																																																																																											
SHIPMENT RELEASE (client use) Released by: Hannah Shinton Date: Thursday, July 7th, 2022 Time: _____		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Chris Date: 7 July 22 Time: 1050		FINAL SHIPMENT RECEPTION (lab use only) Received by: RL Date: July 8, 2022 Time: 1:00																																																																																											
SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 7.6 FINAL COOLER TEMPERATURES °C: 7.0		REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.		1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.																																																																																											

Environmental Division
 Vancouver
 Work Order Reference
VA22B5770

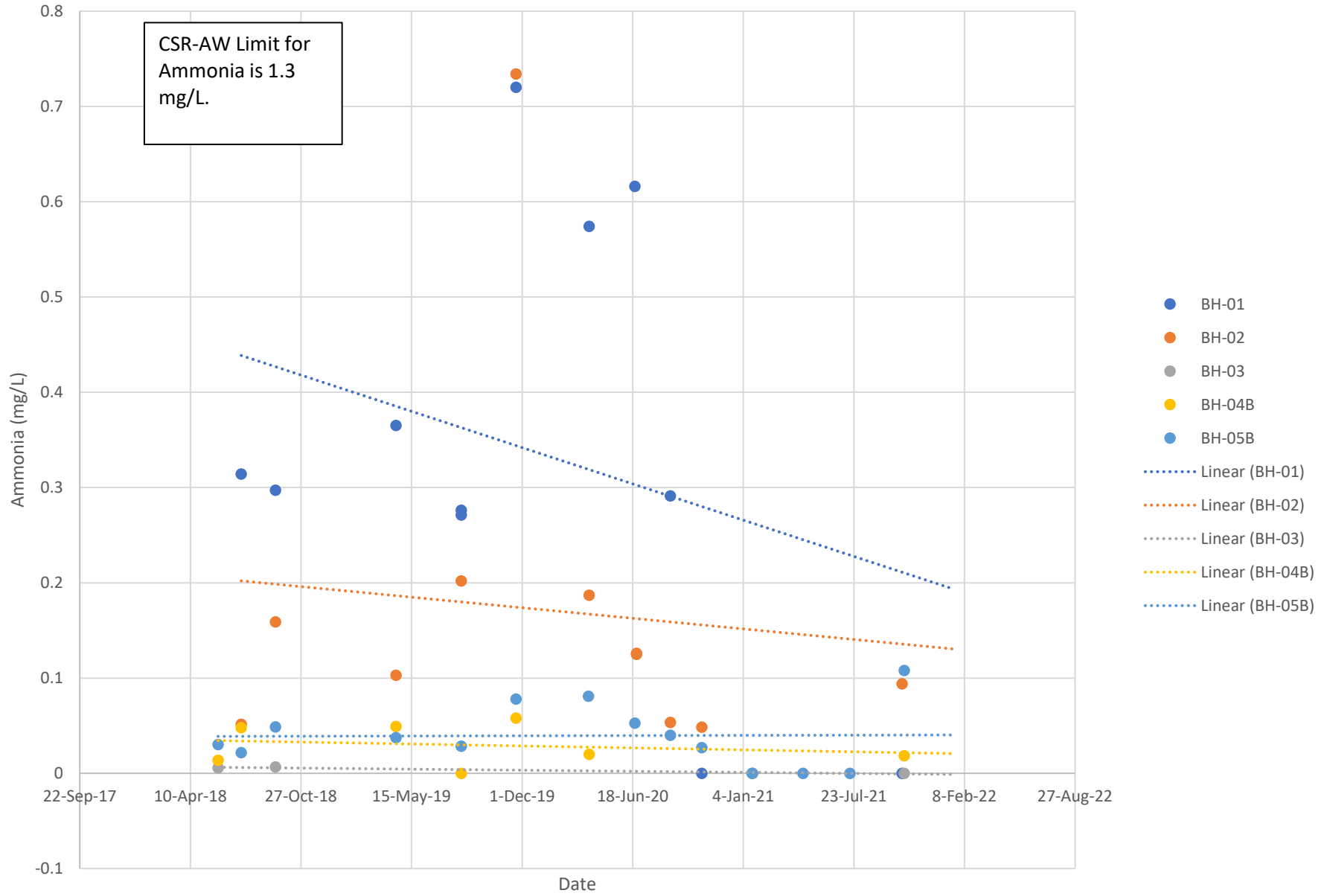


Telephone : +1 604 263 4188

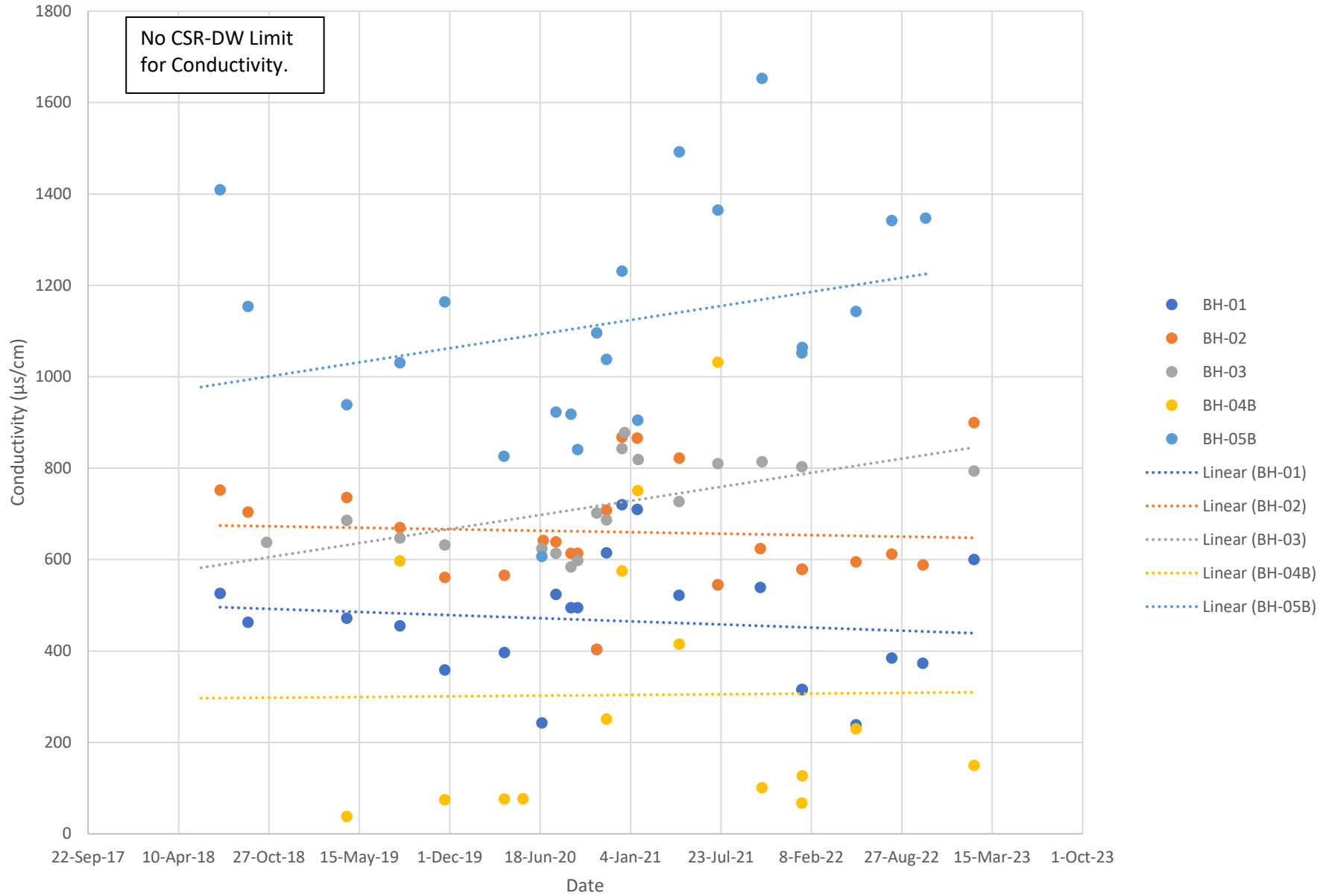
Appendix H Trend Analysis



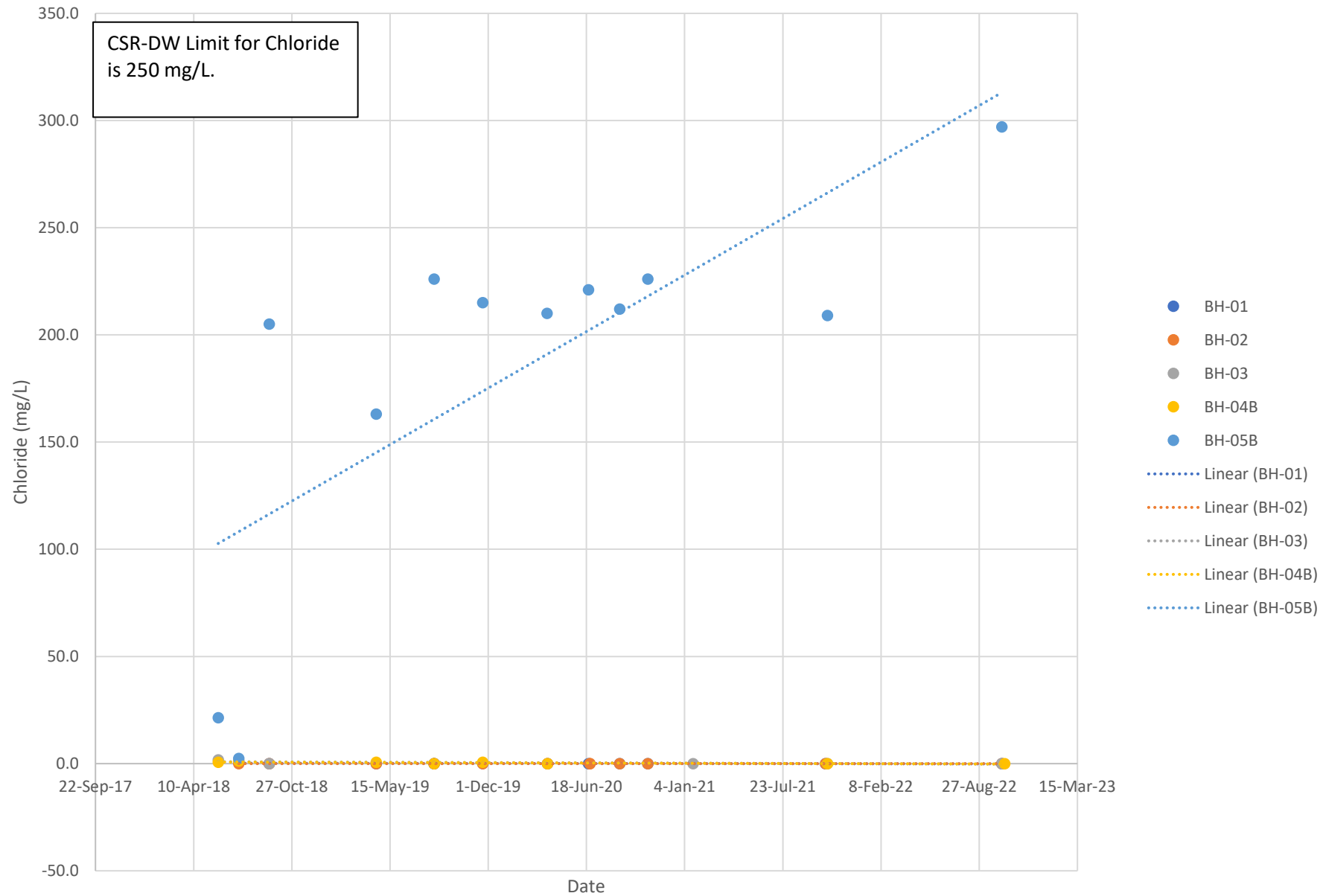
Ammonia



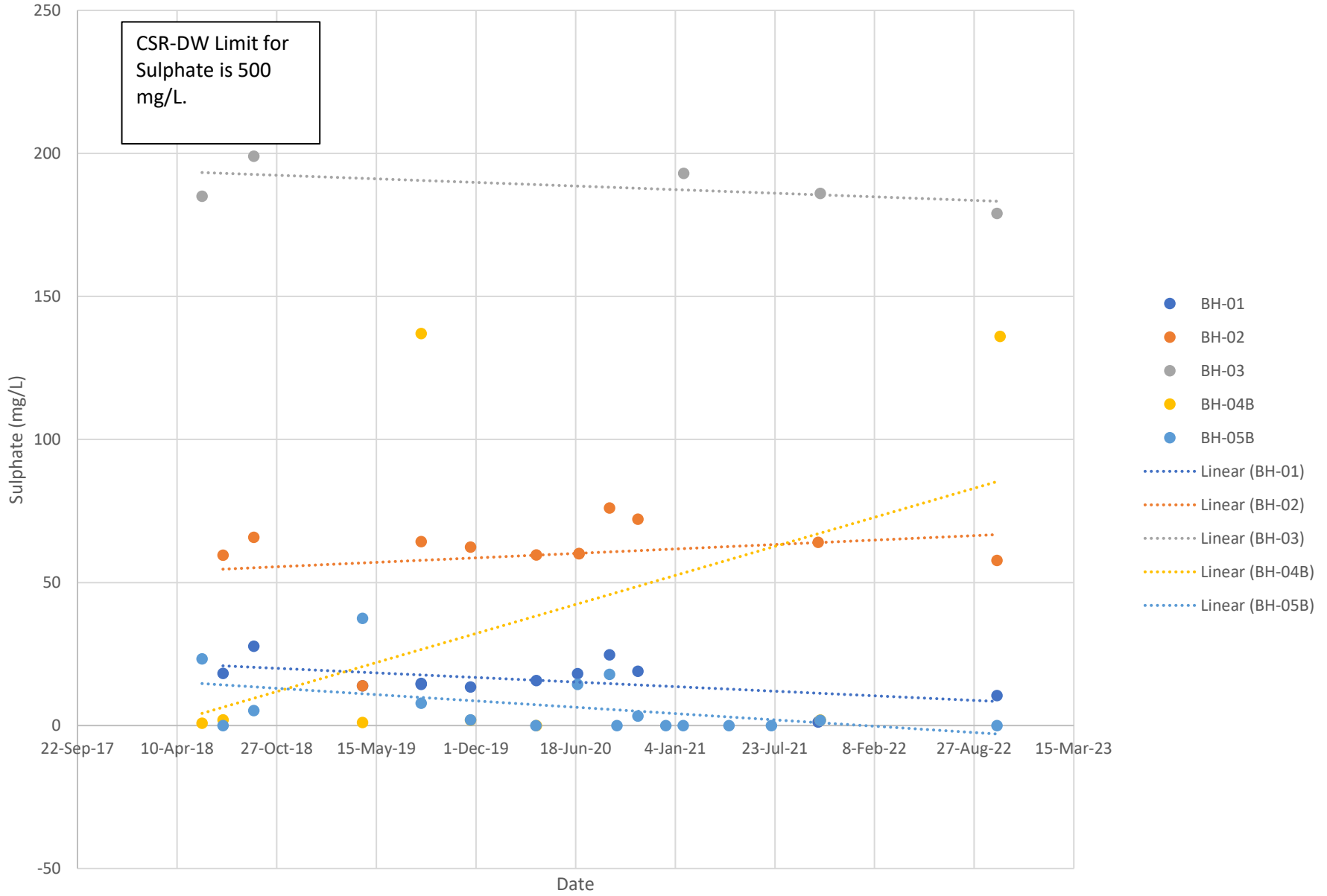
Conductivity



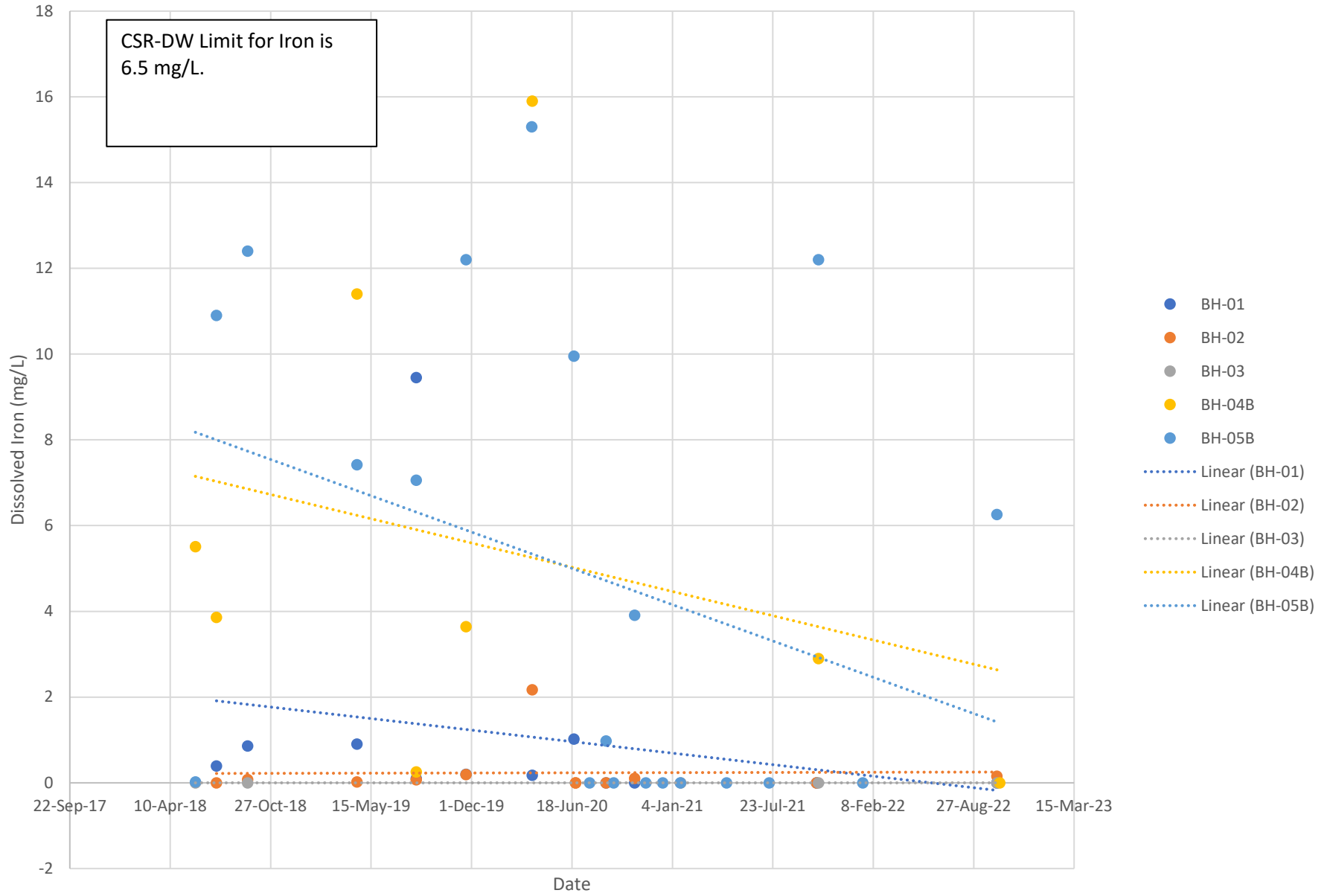
Chloride



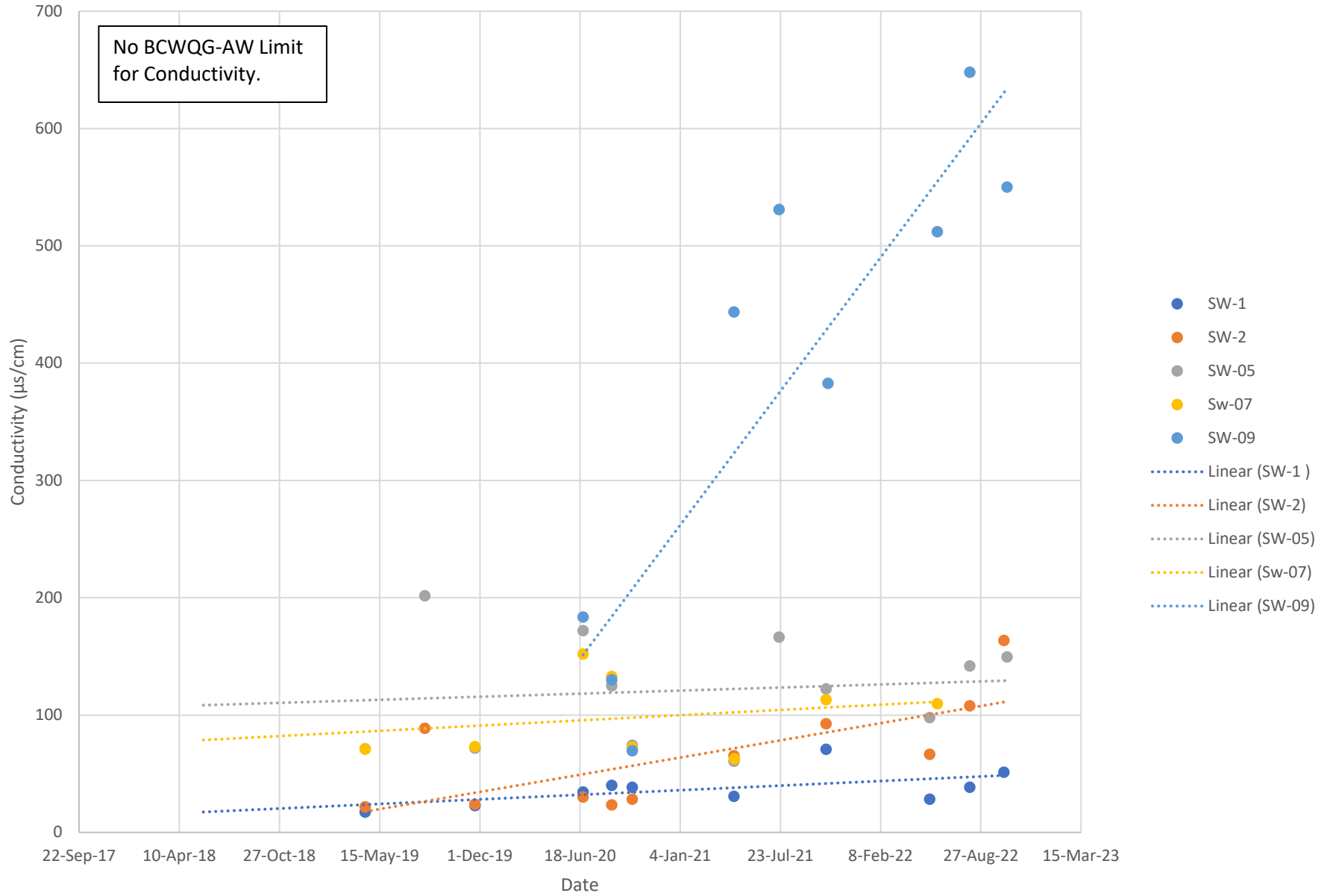
Sulphate



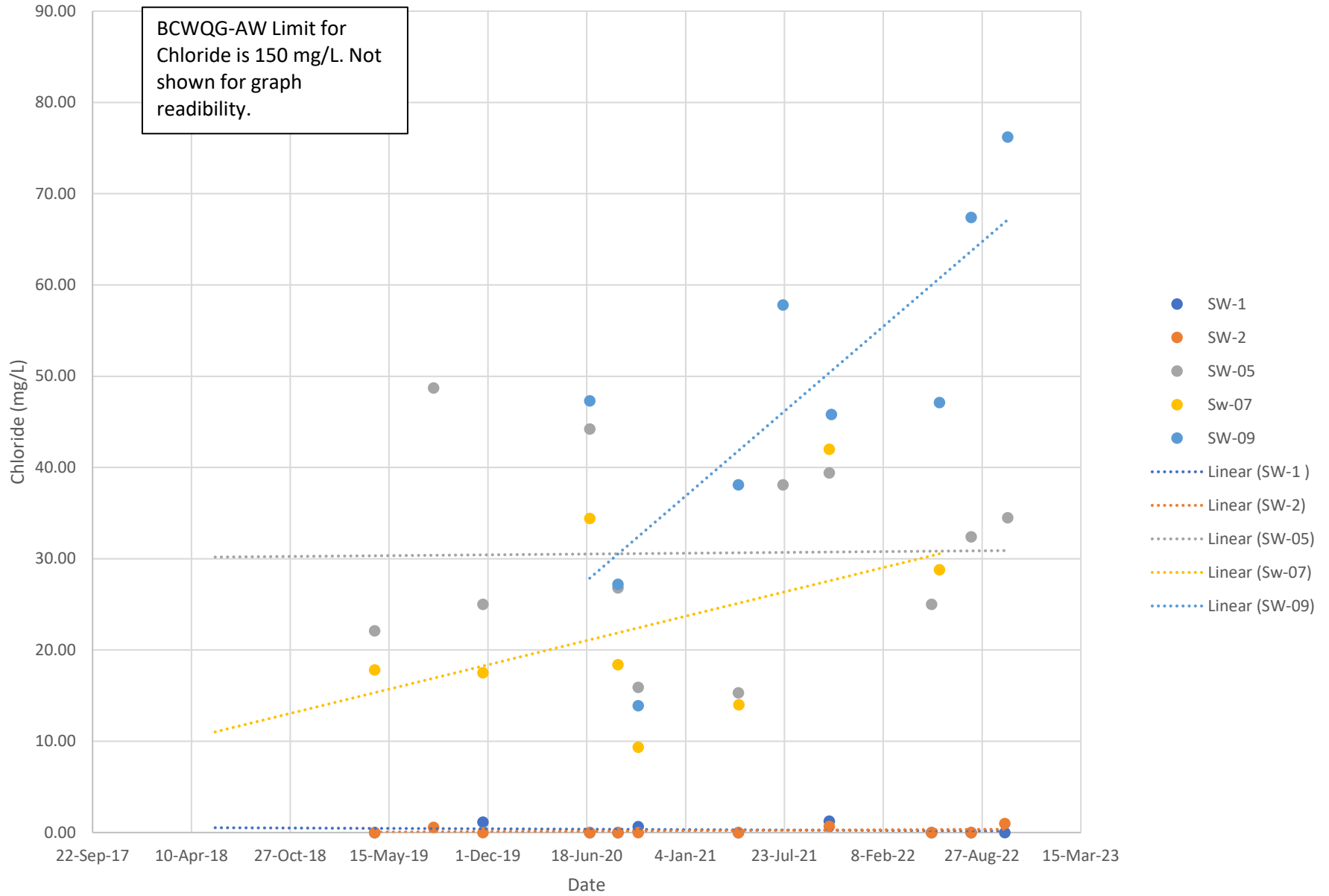
Dissolved Iron



Conductivity

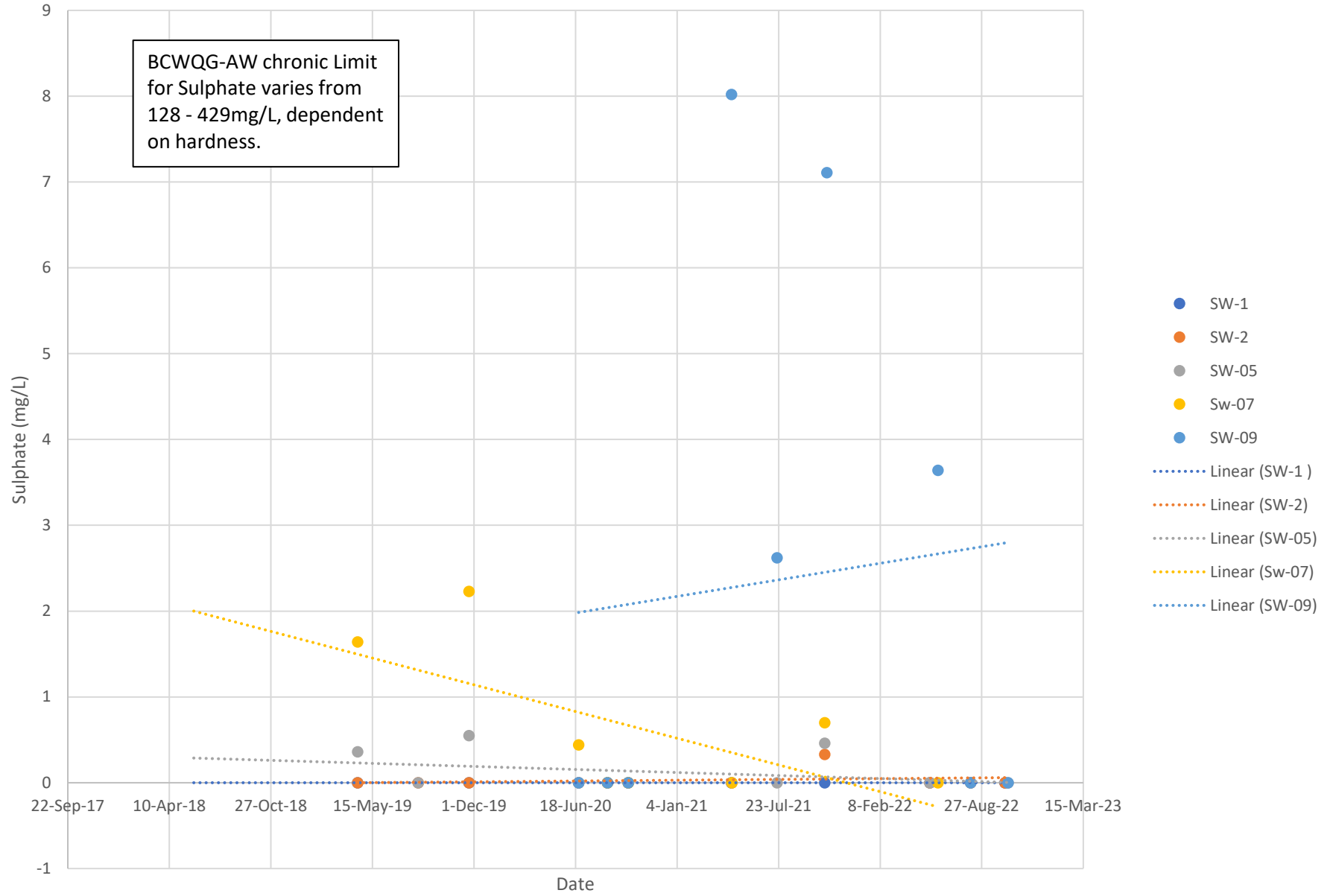


Chloride

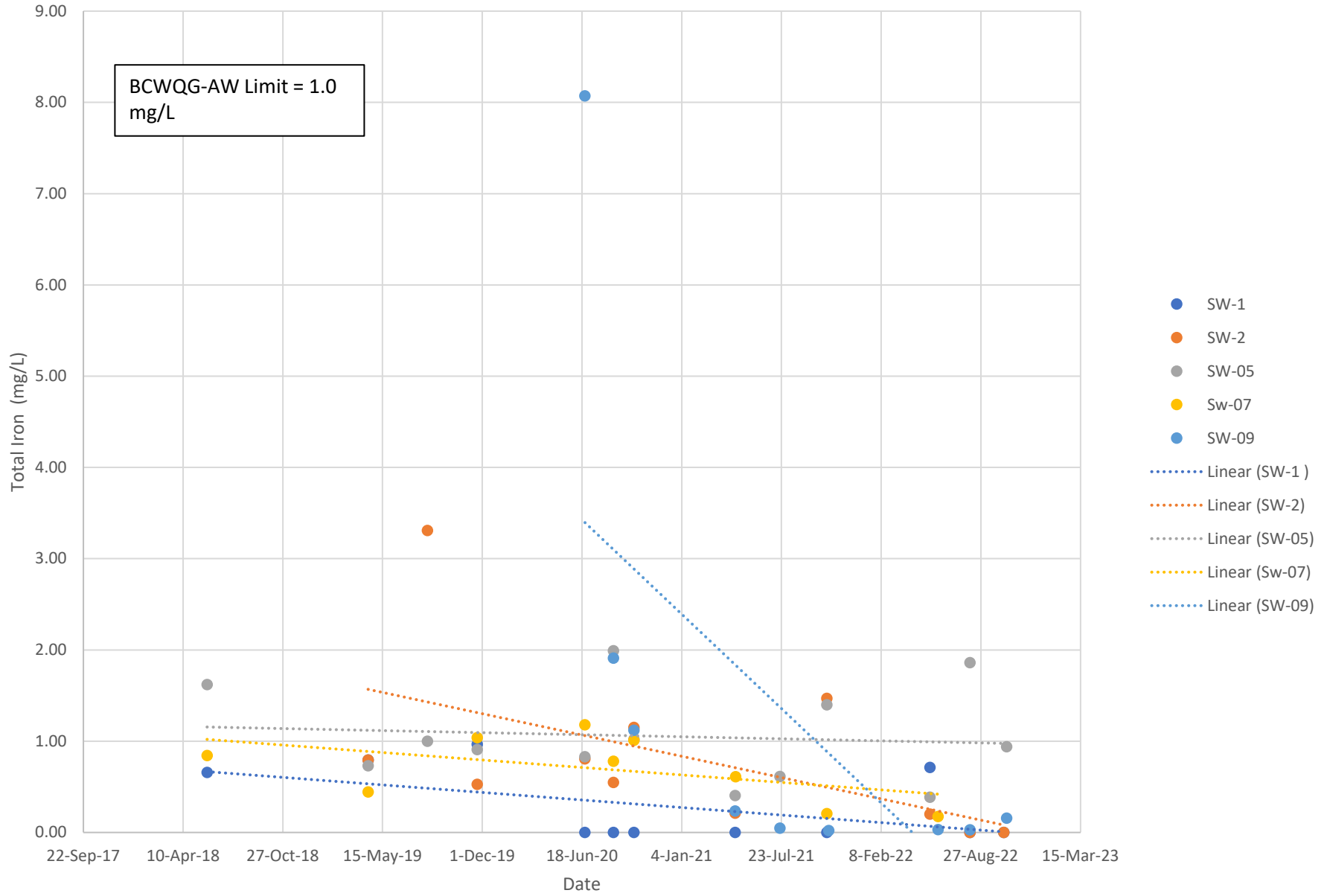


Sulphate

BCWQG-AW chronic Limit
for Sulphate varies from
128 - 429mg/L, dependent
on hardness.



Total Iron





Regional District of
Kitimat-Stikine

Appendix C OC Temporary Authorisations



File: 17226

June 29, 2022

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

VIA EMAIL: Nicole Lavoie nlavoie@rdks.bc.ca

Dear Nicole:

RE: Temporary Amendment of Operational Certificate 17226 -Extension of Annual Report Submission deadline.

This letter is in response to your email dated June 28, 2022, to temporarily extend the annual report submission deadline from June 30th to July 6th for 2022 only. You have indicated that the reason for applying for extension is that you need more time to work on the operational end of the report.

Therefore, I hereby amend section 12.2 of operational certificate 17226, to extend the annual report submission deadline to July 6th, 2022, pursuant to section 16 of the *Environmental Management Act*.

This authorization is only valid for the period specified above. This authorization does not affect any other requirements of operational certificate 17226, which will remain in full force and effect.

This decision may also be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered 30 days from the date that the notice of this decision is given. For further information, please contact the Environmental Appeal Board at 250-387-3464.

June 29, 2022

Authorization Number: 17226

If you have any questions please contact Prashanth Subburam, Environmental Protection Technician at Prashanth.Subburam@gov.bc.ca

Yours truly,



Karen Moores
A/Director, Authorizations North
Environmental Protection Division
Ministry of Environment and Climate Change Strategy



December 1, 2022

Tracking Number: 419984
Authorization Number: 17226

REGIONAL DISTRICT OF KITIMAT-STIKINE
300 4545 LAZELLE AVENUE
TERRACE, BC
V8G 4E1

Attention: Erin Blaney, *Solid Waste Manager*, Regional District of Kitimat Stikine

RE: Hazardous Waste Substitution Letter: Carcasses Infected with Avian Influenza

In response to the potential need to manage Avian Influenza Disease (AI) infected mortalities at the Hazelton Landfill east of Hazelton BC, authorized under Operational Certificate No. 17226, I have reviewed the request you submitted to the ministry on November 29, 2022.

Pursuant to the Environmental Management Act (EMA) section 16(4), I amend OC 17226 section 1.1.2. Characteristics of the Discharge, to also allow for Avian Influenza Disease (AI) infected carcasses in compliance with the Hazardous Waste Regulation (HWR).

Pursuant to the Environmental Management Act (EMA) and the Hazardous Waste Regulation (HWR) and under provisions of Section 2(9), I am hereby substituting the requirements in Parts 3, 4 and Sections 43 and 44 of the HWR for the requirements listed below:

1. This Letter of Substitution under HWR Section 2(9) expires 90 days from the date of issuance. Request for extension may be submitted in writing and addressed to the undersigned.
2. The landfill operates under an approved Waste Management Plan and has a valid Operational Certificate (OC-17226).
3. The waste stream authorized comprises AI-infected waste.
4. The waste is confined during handling, storage, and transportation by packing in a 6-millimetre-thick plastic bag placed within a second 6 mil plastic bag and then sealed.
5. The waste materials are disposed of at the landfill by being immediately buried within a minimum of 0.5 m of cover material.
6. A means of identifying the area of burial and ensuring it remains undisturbed must be in place and immediately available to all persons with access to the site.

7. The owner of the facility must keep for inspection by an officer an operating record at his or her facility and must record in a written or retrievable electronic form the following information:
- a. The quantity in kilograms received,
 - b. The method and date received,
 - c. Identifying information from a shipping document such as a bill of lading if available,
 - d. The date and location of burial.

Please note that although a revised Authorization Document has not been produced at this time a copy of this letter is being placed on the Authorization file, as an addendum to the Authorization, to formally reflect the change.

This Authorization does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This Authorization is issued pursuant to the provisions of the *Environmental Management Act* to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Yours truly,



Douglas J. Hill, P.Eng.
for Director, Environmental Management Act

ENCL: None