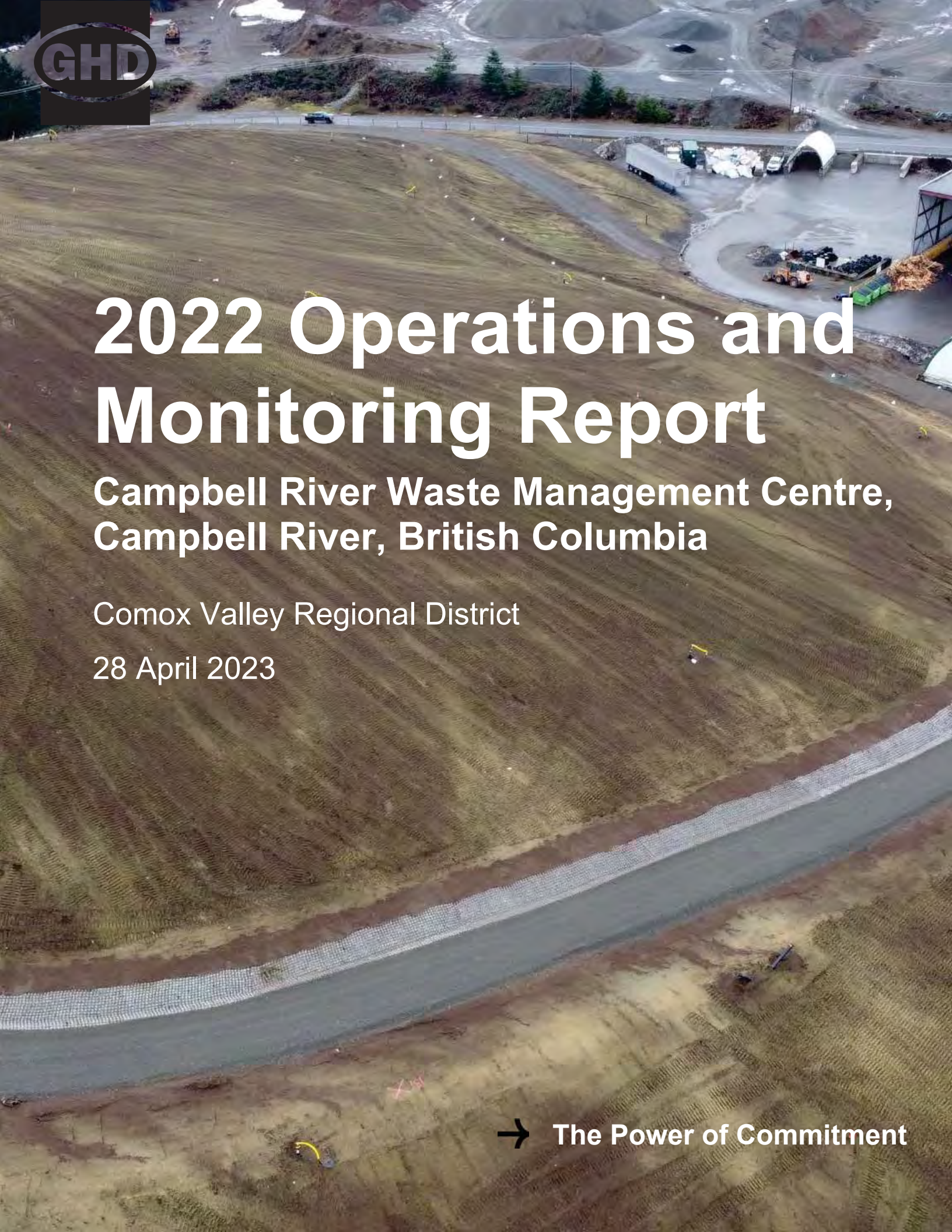

2022 Operations and Monitoring Report

Campbell River Waste Management Centre, Campbell River, British Columbia

Comox Valley Regional District

28 April 2023

→ The Power of Commitment

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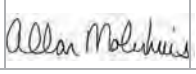
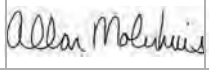
S4	01	David R. Barton	Allan Molenhuis		Allan Molenhuis		April 28, 2023

Executive Summary

GHD Limited (GHD) was retained by Comox Strathcona Waste Management (CSWM), a function of the Comox Valley Regional District (CVRD), to complete the 2022 water quality monitoring and prepare this Annual Operations and Monitoring Report (Annual Report) for the Campbell River Waste Management Centre (Site or CRWMC). The objective of this Annual Report is to summarize the developmental progress and environmental monitoring for the Site during the 2022 calendar year (Reporting Period). The Annual Report contains the information required by Section 10.6 of the Landfill Criteria for Municipal Solid Waste (Landfill Criteria), Section 25.3 of the 2012 Comox Strathcona Solid Waste Management Plan (SWMP), and Section 3.2 of the Operational Certificate (OC) MR-02401.

The Site is located on Crown Lands within the city limits of Campbell River, British Columbia (BC) at 6700 Argonaut Road approximately 7.5 kilometres (km) west of the city centre. The Site is owned by the CVRD and operated by Berry & Vale Contracting Ltd. under contract with the CVRD. The authorized works include the municipal solid waste landfill and related appurtenances.

Site Operations and Development

The CRWMC Sanitary Landfill (Landfill) reached capacity as of May 6, 2022. The Site now operates as a transfer station, with all MSW transferred to the Comox Valley Waste Management Centre (CVWMC) for disposal.

During the 2022 calendar year, approximately 23,910 tonnes of waste were brought to the Site for disposal, resulting in a per capita disposal rate estimate of 0.50 tonnes/year. Most of the waste brought for disposal, 21,709 tonnes, was transferred to the CVWMC for disposal, with the remaining 2,201 tonnes disposed at the CRWMC Landfill. Approximately 4,963 tonnes of waste were diverted from the Landfill.

Using the 2,201 tonnes of waste discharged to the Landfill in 2022, the apparent waste density (mass of waste landfilled/volume of airspace consumed) from January 1 to May 6, 2022, is approximately 0.54 tonnes/m^3.

Construction for final closure of the Landfill at the Site was completed in 2022. Installation of an LFG collection system and enclosed LFG flare was underway in 2022 and will be completed in 2023. A regional organics composting facility was under construction in 2022 on the lot adjacent to the Landfill and is expected to be in operation in 2023.

Environmental Monitoring

Groundwater was observed to flow towards the east across the Site based on water levels measured during the Reporting Period, which is consistent with previous years. Groundwater elevations across the Site showed a decreasing trend between 2017 and 2019, but have since stabilized. Groundwater elevations at the Site in 2022 were consistent with the elevations observed in 2021 and 2020. The Site water table was found to fluctuate seasonally between 0.41 to 5.91 m with a median fluctuation of 1.55 m over the four monitoring events conducted in 2022.

Analytical results for groundwater and surface water samples (SWM Pond only) are compared to the BC Contaminated Sites Regulation (CSR) (BC Reg. 375/96 including amendments up to BC Reg. 179/2021, July 7, 2021) Schedule 3.2 Column 3 (Aquatic Life Freshwater) (FAW) and Schedule 3.2 Column 6 (Drinking Water) (DW).

Surface water analytical results (excluding SWM Pond) are compared to the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (BC ENV, 2021), BC Source Drinking Water Quality Guidelines (ENV, 2020), and BC Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (BC Ministry of Environment [MOE], 2021) (WQGs) for drinking water (DW) and the protection of freshwater aquatic life (FWAL).

No Landfill-derived impacts were observed in groundwater quality at background monitoring wells AM02-1 and MW01-16. Groundwater quality at monitoring wells AM02-1 and MW01-16 are considered to be representative of background groundwater quality at the Site.

Leachate impacts continue to be observed in groundwater at the Landfill Vicinity monitoring wells EBA04-6, EBA04-7, HBT94-1, and HBT94-2. Dissolved manganese concentrations were greater than the CSR DW standard during one or more monitoring events in 2022 at HBT94-1.

Concentrations of leachate indicator parameters at EBA11-1 are significantly elevated relative to background groundwater quality and the other Block J monitoring wells. Groundwater quality at EBA11-1 is likely affected by the infiltration of leachate impacted surface water in the SWM Pond.

With the exception of EBA11-1, groundwater quality results from the Block J Vicinity wells are stable and do not show landfill-derived groundwater impacts.

Overall, the 2022 monitoring results from the Downgradient Off-Site well MW02-18 shows that Landfill-derived impacts remain present at the shallow monitoring well. Results from the remaining wells show that minor impacts may be present but are limited and are not worsening. Ammonia and dissolved manganese concentrations at MW02-18 were greater than the applicable CSR standards throughout 2022. It is noted that monitoring well MW02-18 is located adjacent to a historic dumping ground, therefore, impacts noted at MW02-18 may be from a combination of the Landfill and historical dumping.

Deep downgradient groundwater quality southeast of the Site at AG99-01, AG99-02, AG99-04, and AG99-05 remains generally stable over time with minimal leachate impacts observed. With the exception of dissolved vanadium concentrations at AG99-02, concentrations of analysed parameters were below the applicable CSR standards in 2022. The source of vanadium in groundwater quality at AG99-02 is not known at this time but is unlikely related to Landfill activities.

Based on the results of surface water quality monitoring conducted in 2022 at SW-1 (tributary of Cold Creek), and SW03-17 (unnamed pond upstream of SW-1) the presence of leachate impacts is not suspected.

The SWM Pond was sampled once in November of 2022. Water quality in the SWM Pond appears to be impacted by Landfill activities, with concentrations of several leachate indicator parameters similar to typical MSW leachate. Water quality in the SWM Pond is impacted by discharge from the side slope seeps which had been re-routed from Argonaut Road.

It is anticipated that surface water quality in the SWM Pond and groundwater quality at EBA11-1 will improve now that the final cover has been applied to the Landfill. These measures will minimize precipitation infiltration to the Landfill, resulting in a significantly lower rate of leachate generation. The final cover will also significantly increase the clean surface water runoff from the landfill footprint that flows to the SWM Pond resulting in increased infiltration of clean surface water upgradient of EBA11-1.

Recommendations

Continue the groundwater and surface water monitoring programs (Appendix K) on a quarterly basis. Install the LFG blower and flare and commission the LFG collection and management system. Complete the landfill gas monitoring program as described in the Closure Plan.

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1. Introduction

GHD Limited (GHD) was retained by Comox Strathcona Waste Management (CSWM), a function of the Comox Valley Regional District (CVRD), to complete the 2022 water quality monitoring and prepare this Annual Operations and Monitoring Report (Annual Report) for the Campbell River Waste Management Centre (CRWMC or Site).

1.1 Objectives and Scope

The purpose of this Annual Report is to summarize the Site operations and development activities carried out during the 2022 calendar year (Reporting Period) and to provide and assess the Site environmental monitoring data. The Annual Report contains the following information in accordance with Section 10.6 of the Landfill Criteria for Municipal Solid Waste (Landfill Criteria) (BC MOE, 2016), Section 25.3 of the 2012 Comox Strathcona Solid Waste Management Plan (SWMP) (AECOM, 2013), and Section 3.2 of the Site's Operational Certificate (OC) OC-2401 (Appendix A):

- A review of the preceding year of operation, plans for the next year and any new information or proposed changes relating to the facility.
- A summary of the landfill operation equipment.
- Closure works completed.
- Summary of complaints received, and the actions taken as a result of the complaint.
- Identification of non-compliance items and proposed action plan and schedule to reach compliance (if applicable).
- Progress report on efforts to resolve previously identified non-compliance items (if applicable).
- Landfill gas quantities collected, flared, and utilized.
- The tonnage of each type of waste discharged into the landfill or diverted.
- An updated estimate of the municipal solid waste (MSW) per capita disposal rate.
- A waste area population table including adjusted projected population for the estimated facility life.
- A survey including volume changes, on required frequency.
- The remaining Site life and capacity update.
- Update to the closure and post closure liability fund estimate.
- Comparison of the water quality monitoring data with the performance criteria in Section 4 of the Landfill Criteria for Municipal Solid Waste and the Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills, interpretation of the monitoring data, identification and interpretation or irregularities and trends, recommendations, and any proposed changes to the monitoring program.

1.2 Scope and Limitations

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

1.3 Regulatory Settings

The CRWMC sanitary landfill (Landfill) currently operates under Operational Certificate 2401 (OC-2401), issued on December 2, 2003, by the British Columbia Ministry of Environment (MOE), and last amended on May 19, 2020. OC-2401 replaced the original permit, which was issued in November 1973 and last amended in July 1992 (CH2MHILL, 2009). A copy of the OC with the amendment letter are provided in Appendix A. Refuse authorized for disposal at the Site is characterized as "municipal solid waste as defined under the Waste Management Act".

Groundwater quality for the Site has been historically compared to the BC Contaminated Sites Regulation (CSR) (BC Reg. 375/96 including amendments) Schedule 10 (Schedule 10) Column V (Drinking Water) (DW) and Schedule 6 (Schedule 6) Column II (Aquatic Life, Freshwater) (FAW) and Column V (Drinking Water) (DW). On November 1, 2017, the Stage 10 (Omnibus) and Stage 11 (Housekeeping) amendments came into effect, thus replacing the CSR Standards listed above. The CSR standards applied in this Annual Report are:

– Schedule 3.2 Generic Numerical Water Standards Column 3 for Freshwater Aquatic Life (FAW)
– Schedule 3.2 Generic Numerical Water Standards Column 6 for Drinking Water (DW)

The appropriate groundwater standards that apply to the Site depend on the current and future potential groundwater and surface water uses in the vicinity of the Site and the potential for groundwater or surface water at the Site to flow to surface water bodies that support aquatic life in the vicinity of the Site. The BC Ministry of Environment and Climate Change Strategy (ENV) (formerly the BC MOE) Protocol 21 Water Use Determination (Protocol 21) provides the criteria for selecting the appropriate CSR standards for water quality.

Protocol 21 specifies that Aquatic Life standards apply to groundwater quality at sites located within a 500 metre (m) radius of a surface water body. According to iMapBC, accessed April 6, 2023, the Site is located less than 500 m from two fresh surface water bodies: McIvor Lake and an ephemeral tributary of Cold Creek. McIvor Lake is upgradient of the Site and is not a receptor of any groundwater discharge from the Site. The tributary of Cold Creek is downgradient of the Site and may potentially be a receptor of groundwater discharge from the Site. Therefore, FAW standards apply to groundwater at the Site.

Based on the information obtained from iMapBC, accessed April 6, 2023, five water supply wells are located within a 500 m radius from the Site listed for Private Domestic use. Additionally, based on GHD's correspondence with the owner of the adjacent property, located at 5900 Argonaut Road, there is an unregistered shallow dug well located on the 5900 Argonaut Road property, which is located less than 500 m from the Site. GHD understands the well is used for domestic purposes at this time. The CSR DW standards have been applied to the Site in accordance with Protocol 21.

Surface water analytical results are also compared to the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (ENV, 2021), BC Source Drinking Water Quality Guidelines (ENV, 2020), and BC Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture (BC MOE, 2021) (collectively defined as WQGs) for drinking water (DW) the protection of freshwater aquatic life (FAW).

1.4 Annual Report Organization

The Annual Report is organized into the following sections:

– Executive Summary
– Section 1 Introduction
– Section 2 Site Background
– Section 3 Site Operations and Development
– Section 4 Environmental Monitoring Program

– Section 5 Environmental Monitoring Results
– Section 6 Compliance Assessment
– Section 7 Summary
– Section 8 Recommendations
– References

2. Site Background

2.1 Site Location

A Site location map is presented on Figure 1 and a Site Plan is presented on Figure 2. Figure 3 presents the land zoning uses in the area surrounding the Site.

The Site is located on Crown Lands within the city limits of Campbell River, BC at 6700 Argonaut Road, approximately 7.5 kilometres (km) west of the city centre. The legal description for the southern half of the Site is Block M, all part of District Lot 85, Sayward District. The legal description of the northern portion of the Site is Block J, all part of District Lot 85, Sayward District. The previous legal land description for Block m was “Block C, together with that part of Block A, and that part of Block K, all part of District Lot 85, Sayward District”. The aforementioned lands were all combined into Block M as per Land Lease V934579 dated January 8, 2019, from the Ministry of Forests, Lands and Natural Resource Operations.

A portion of Block M and a majority of Block J are located within the Agricultural Land Reserve (ALR) as set out by the Agricultural Land Commission (ALC). The CVRD has received a variance from the ALC with regards to the current location of the Landfill and surface water management pond where they overlap with ALR lands. The ALR boundary also includes land parcels located north and east of the Site as illustrated in Figure 4.

The total Site area is 29.7 hectares. The Site is currently zoned as Industrial Four (I 4) under the City of Campbell River Bylaw No. 3250, 2006, consolidated to bylaw 3743, 2019 (last amended November 4, 2019).

Island Ready Mix is located immediately to the west of the Site and houses operations and equipment for concrete manufacturing and a gravel pit. West Shore Aggregates Ltd. operates a gravel pit immediately to the south of the Site. The West Shore Aggregates property also has a landfill permitted to discharge refuse from “dryland log sorting, land clearing, construction and demolition operations” under permit PR 07730.

Mature forests situated on Crown Land are located to the north and east of the Site. There are three residential dwellings located approximately 500 m to the northeast of the Landfill footprint. The property immediately to the east of Block J is occupied by a single dwelling residential lot.

There are also several active and historical industrial operations in the vicinity of the Site. Active industrial operations include an auto scrap yard, three construction waste landfills (permits PR 07730, PR 10807, and PR 9081), aggregate extraction pits, an asphalt paving plant, and an Emcon facility, which includes a salt storage shed. Historical operations in the area include a crane operation, which housed facilities for cleaning copper coated fish farm nets, and a metal scrap yard.

2.2 Landfill Development

Prior to waste disposal operations at the Site, the Site operated as an aggregate extraction facility in the 1950s. According to CH2M HILL’s 2009 closure plan, the Site was then used as an unregulated dump site prior to the 1970s. Waste burning took place at the Site as well as disposal of liquid wastes (EBA, 2014). The City of Campbell River took over Site operations in the mid 1970’s until ownership was transferred to the CVRD in 1999 (EBA, 2014). A private

contractor, Berry & Vale Contracting Ltd. (Berry & Vale), has operated the Site under contract with the CVRD since 1996.

According to the SWMP, the Site was projected to reach its capacity in early 2012. A transfer station was constructed in 2011 to divert certain incoming waste streams to the Comox Valley Waste Management Centre (CVWMC). In 2014, a mechanically stabilized earth wall (MSE wall) was constructed along the southeastern Site boundary with the aim of addressing slope stability concerns and adding additional capacity.

Prior to closure of the landfill in May 2022, landfilling occurred on Block M. Block J is primarily used for extraction of sand and gravel for use as cover material within the Landfill. An updated 2017 Design, Operations, and Closure Plan (2017 DOCP) (GHD, 2017) was prepared in 2017 and was submitted to ENV in March 2018. The 2017 DOCP provides final contours and a closure plan for the Site. The 2017 DOCP includes updated plans for the management of landfill gas and surface water. In 2018 construction began on a surface water management pond (SWM Pond) in Block J and was completed in 2019. An updated Closure Plan was prepared and submitted to ENV October 1, 2020.

The Landfill reached capacity and ceased landfilling of waste on May 4, 2022. The Landfill closure was designed by GHD and was completed in 2022. Installation of an enclosed LFG flare was underway in 2022 and will be completed in 2023. A regional organics composting facility designed by Sperling Hansen began construction in 2022 on the adjacent lot to the Landfill (Block J) and is expected to be in operation early 2023.

Figure 2 presents a site plan for the Site.

2.3 Topography and Drainage

Topography in the vicinity of the Site generally slopes downward to the east from McIvor Lake, (approximately 400 m to the west of the Landfill footprint), flattening out approximately 500 m to the east of the Site. The Site is located on the north side of a local valley. The narrow valley floor slopes to the east/northeast following the course of Argonaut Road. The valley appears to have been expanded laterally by historical soil extraction operations at the Site and to the southwest of the Site across Argonaut Road.

There are no natural watercourses on the Site. A constructed surface water infiltration swale is located along the southeast boundary of the Landfill footprint, which collects surface runoff from the southeast side of the Landfill footprint. During periods of heavy rainfall, surface water has been observed to flow northeast along the swale infiltrating into the ground within approximately 500 m of the Landfill footprint.

The closest natural surface water channel is located 400 m northeast of the Site and is one of several ephemeral tributaries of Cold Creek. Cold Creek discharges into the Quinsam River approximately 3 km northeast of the Site. Quinsam Hatchery, a salmon hatchery, is located at the confluence of Cold Creek and the Quinsam River. Quinsam River ultimately drains into the Campbell River approximately 2.3 km downstream of the confluence of Cold Creek and Quinsam River.

McIvor Lake, which is contiguous with Campbell Lake, is located approximately 400 m to the west of the Site with a lake elevation of approximately 180 metres above mean sea level (m AMSL) well above the inferred original ground surface elevation of the Site (140 m AMSL). A drainage map illustrating surface water drainage in the area of the Site is presented in Figure 5.

2.4 Geologic Setting

2.4.1 Regional Geology

Vancouver Island is part of the Wrangellia Terrane, which includes most of Vancouver Island, Haida Gwaii, and parts of central Alaska. The Wrangellia Terrane is composed mostly of widespread, late Triassic aged flood basalts (Greene, Scoates and Weis, 2005). Regional bedrock geology in the vicinity of the Site is composed of the Vancouver Group of mid to late Triassic age (Guthrie, 2003). The Vancouver Group is composed of undivided sedimentary rocks, marine sedimentary volcanic rocks, and small amounts of siltstones.

At several time periods during the Pleistocene Epoch, Vancouver Island was believed to be glaciated with ice thicknesses up to 2,000 m. During the recession of the last glaciation approximately 14,000-years ago, glacial and glaciofluvial sediments were deposited, and in some cases reworked and redeposited, to make up many of the present surficial deposits of Vancouver Island. These deposits consist of till, which is deposited directly by glacial activity and consist of larger clasts supported in a matrix of fine-grained sediment, and of glacial outwash, which consists primarily of poorly sorted, coarse grained (sand and gravel) sediments deposited by glacial melt water (Greene, Scoates and Weis, 2005). The overburden at the Site consists of glaciofluvial and outwash deposits of sand and gravel.

2.4.2 Site Geology

The understanding of the Site geology presented in the following sections is based on existing Site borehole logs for the monitoring wells, provided in Appendix B, regional mapping, previous reports, and well completion logs from nearby private wells.

Overburden Geology

Overburden geology at the Site is relatively homogeneous and is primarily composed of deposits of fine to medium grained sand interbedded with deposits of fine to medium grained sand and medium subrounded gravel. Lenses of silt and fine-grained sand up to 4 m in thickness are present in an irregular distribution across the Site. Decommissioned monitoring well EBA04-5 was the deepest boring within the Site boundaries with a depth of 67 metres below ground surface (m BGS). Bedrock was not encountered at monitoring well EBA04-5. The boring locations (monitoring wells) are illustrated on Figure 2.

Bedrock Geology

Based on Site borehole logs, bedrock has not been encountered in any boreholes advanced within the Site or immediately to the north and west of the Site, which are up to 67 m deep. Bedrock is also not encountered at private water supply wells, which are approximately 60 m deep and located approximately 3 km to the northeast to the Site. Bedrock is encountered at a depth of approximately 1.8 m BGS approximately 1.5 km to the southwest of the Site based on well stratigraphy log for private water supply well (well tag 98020) adjacent to McIvor Lake. The bedrock lithology was not indicated on the well log.

From review of bedrock geology maps of the area, it appears the Karmutsen formation is the bedrock unit in the vicinity of the Site. The Karmutsen formation is comprised of volcanic basalts and breccias.

2.5 Hydrogeologic Setting

The BC aquifer classification system lists Aquifer 975 to be evident over the extent of the Site. Aquifer 975 is classified as a sand and gravel aquifer of moderate productivity, high vulnerability, and low demand.

The Site is located on an unconfined aquifer primarily composed of sands and gravels. Groundwater within this aquifer flows to the east/northeast across the Site. From the mid-1990s to the early 2000s an overall decrease in groundwater elevations within the sand and gravel aquifer by 2 to 4 m is apparent based on historical Site groundwater elevation measurements. The cause of this decrease in groundwater elevations is unknown, however, this phenomenon is not suspected to be related to the Site.

The Site monitoring wells are generally screened at depths ranging from approximately 1 to 25 m below the top of the water table within the overburden aquifer. Wells screened less than 15 m below the top of the water table are intended to monitor the shallow portion of the overburden aquifer. Wells screened greater than 15 m below the top of the water table are intended to monitor the deep portion of the overburden aquifer.

Figures 6 and 7 present groundwater contours for the May and November 2022 monitoring events. Details of the results of the 2022 hydraulic monitoring program at the Site are presented in Section 5.1.

2.6 Potential Receptors

Surface water bodies located within a 500 m radius of the Site are McIvor Lake and Cold Creek. Based on the local topography and interpreted groundwater flow direction, McIvor Lake is located upgradient from the Site; therefore, it is an unlikely receptor of groundwater or surface water from the Site. The ephemeral tributary of Cold Creek is located northeast of the Site boundary (750 m northeast of the waste footprint). Based on local topography, groundwater, and surface water elevations and hydrogeologic conditions (i.e., unconfined sand and gravel aquifer) of the area, the nearest tributary of Cold Creek is downgradient of the Site. There are no surface water drainages from the Site to the tributary. Groundwater discharge to this tributary is not confirmed as groundwater elevations in the vicinity of the ephemeral tributary is not known. Surface water sampling is carried out on the Cold Creek tributaries east and northeast of the Site. (SW-1 located on a tributary of Cold Creek located approximately 1,100 m east of the Site and SW03-17 located approximately 1000 m east of the Site on a pond).

Based on a search of the iMapBC (accessed April 6, 2022), there are twelve water wells within a 500 m radius of the Site. Five of the water wells are listed as water supply wells for Private Domestic use, five are listed as water supply wells for Commercial/Industrial use, one is listed as a water supply well for unknown use and one is listed as a decommissioned monitoring well (Well tag 110853 assigned as monitoring well GLL93-1) in 2013. The well licenses and a map indicating the locations of the water wells are included in Appendix C.

Well tag 84136 was included in the 2020 environmental monitoring program (EMP) under the label EBA04-1. It should be noted the BC Water Resource Atlas indicates that well tag 84136 (labeled EBA04-1) is located at the southeast side of the Landfill footprint, however, it is actually located at the southwest corner of the Site.

Well tag 109728 was installed in January 2015 and appears to be located southeast of the Landfill footprint on the south side of Argonaut Road.

Well tags 122464, 122450, 39950, 73577, 74191, 74207, 93413, and 103257 appear to be located hydraulically upgradient from the Site; therefore, it is unlikely that MSW leachate from the Site will migrate to these well locations.

GHD understands an unregistered well is located on the 5900 Argonaut Road property approximately 70 m east of the Block J property line. GHD understands the well is a dug well currently used for domestic purposes. The well is approximately 7.9 m (26 feet) deep.

3. Site Operations and Development

3.1 Site Operations

The Site operates 7-days a week from 8:30 a.m. to 5:30 p.m. and is closed on all statutory holidays. The authorized works includes entrance facilities, sanitary landfill, recycling, and waste drop off/storage areas, and related appurtenances.

3.1.1 Entrance Facilities

The Site entrance is equipped with a lockable and electrified gate system, posted signs, power, and phone connection. The Site receives waste primarily from the Campbell River waste shed, which includes the City of Campbell River and the surrounding communities. Waste collected from transfer stations in Gold River and Cortes Island is also transferred to the Site. A weigh scale and scale house with a full-time attendant is located near the entrance.

3.1.2 Landfill

The Landfill is located to the northeast of the entrance facilities. As of May 4, 2022, the Landfill is closed and only accepts waste to be transferred to the CVWMC. It is a single-cell unlined natural attenuation landfill.

3.1.3 Transfer Station

The transfer station at the Site currently accepts the following types of waste:

– Household waste (non-recyclable)
– Construction and demolition materials
– Clean wood waste
– Yard waste
– Recyclable drywall

Non-recyclable household waste and construction and demolition waste received at the transfer station is discharged to the Landfill. Clean wood waste and yard waste received at the transfer station is diverted from the Landfill at off-Site facilities.

3.1.4 Management of Recyclable Materials

The selected recyclables that are accepted at the Site are:

– Glass containers
– Foam packaging
– Cartons and paper cups
– Plastic film
– Other flexible plastic packaging
– Metal containers
– Hard plastic containers
– Paper and cardboard
– Household batteries (excluding vehicle batteries)
– Residential small appliance and power tools
– Larger residential product packaging (e.g., hard plastic pots and trays)
– Scrap metal
– Drywall
– Refrigerant containing items
– Commercial recyclable hard plastics
– Tires off of rims (commercial and residential)
– Light bulbs (commercial and residential)
– Yard waste and grass clippings
– Clean wood waste
– Cooking oil
– Thermostats
– Polychlorinated biphenyls (PCBs) ballasts
– Smoke alarms and carbon monoxide detectors
– Commercial and residential motor oil and antifreeze
– Propane cylinders

3.1.5 Fencing

The entrance facilities and Landfill area are surrounded by an electric fence operated year-round.

3.2 Changes from Approved Reports, Plans, and Specifications

3.2.1 CRWMC Closure

The Landfill closure and updating plan and conceptual landfill gas design were submitted to the ENV October 1, 2020 and was accepted on February 2, 2021. The final issued for tender drawings for the landfill gas system and closure design, completed by GHD, were submitted to the ENV, as requested, on April 5, 2022.

An application for an OC amendment will also be submitted to reflect the closed status of the Landfill within 2023.

There were no other changes to approved reports, plans and specifications in 2022.

3.3 Site Development

3.3.1 Closure Works

Following closure of the Landfill in May 2022, a geomembrane and final cover were applied. The final cover is currently establishing vegetative cover. As part of the closure works, monitoring well EBA04-2 was decommissioned on July 6, 2022.

3.3.2 Composting Facility

A regional organics composting facility designed by Sperling Hansen began construction in 2022 on the adjacent lot to the Landfill (Block J) and is expected to be in operation early 2023.

3.3.3 Maintenance and Repairs

Ongoing maintenance and repairs of Site equipment was completed as scheduled and required.

3.3.4 Inspections

There were no formal documented inspections in 2022. Landfill cover is native sands and gravels with limited grass growing and there were no signs of significant settlement, burrowing animals or erosion identified during regular operations.

3.4 Complaints

No complaints were received in 2022 for the Site.

3.5 Emergencies, Incidents and Non-Compliance Items

No emergencies, incidents, or non-compliance issues occurred at the Site in 2022.

3.6 Landfill Gas Collection

As part of the 2017 DOCP (GHD, 2018), GHD updated the most recent Landfill Gas Generation Assessment (Conestoga-Rovers and Associates, 2010) to assist the development of the conceptual design of the landfill gas (LFG) collection system for the Site. The updated LFG generation assessment (GHD 2017) predicted that the Site will produce approximately 1,536 tonnes of methane in 2020 (GHD, 2017). The detailed design of the LFG collection system occurred in 2021. Construction of the LFG collection system was completed in 2022, with 31 vertical LFG wells and 13 probes installed. The blower and flare will be installed in 2023.

3.7 Waste Tonnage

Table 1 presents tonnages of each type of waste received and discharged to the Landfill in 2022. Approximately 25,303 tonnes of material were received from the Campbell River wasteshed, of which, 1,393 tonnes of non-MSW materials were diverted by customers, and 23,910 tonnes of MSW accepted. Of that, 21,209 tonnes of MSW were transferred to the CVWMC, and 2,201 tonnes of MSW were landfilled at the CRWMC in 2022. An additional 4,963 tonnes of recycled/diverted materials and 1,067 tonnes of clean fill were received, as measured over the scale.

3.7.1 Estimate of MSW Disposal Per Capita

Table 2 presents the current and projected population of the Campbell River wasteshed until the estimated date of Site closure. Based on 23,910 tonnes of waste generated and a population of 47,761 in the Campbell River wasteshed in 2022, the updated 2022 municipal solid waste per capita estimate is 0.50 tonnes.

3.8 Volume Survey

The annual airspace consumption estimate for 2022 was calculated based on topographic surveys completed of the Site by McElhanney Associates Ltd. on December 15, 2021 and May 6, 2022. The calculated airspace used between each survey is presented below:

– December 15, 2021 to May 6, 2022: 4,625 m^3
  - Prorated to January 1 to May 6, 2022: 4,108 m^3
– Total estimated airspace consumed in 2022: 4,108 m^3

3.9 Remaining Capacity and Estimated Site Life

The Landfill reached capacity and stopped accepting waste as of May 4, 2022.

The apparent waste density (mass of waste landfilled/volume of airspace consumed) in 2022 was 0.54 tonnes per m^3.

3.10 Closure and Post-Closure Fund Estimate

The CRWMC closed in spring 2022 and had an anticipated closure cost of $10,548,575. Forecasted closure and post-closure costs for the Site were prepared for the CVRD under separate cover. A copy of the memorandum including the information pertinent to the Site is included in Appendix D.

3.11 Operational Plan for the Next 12-Months

Operational plans for 2023 includes the following activities:

– The Landfill is now closed, and the Site operates as a transfer station.
– Installation of the flare and blower skid, and commissioning of the landfill gas collection system
– Completion of construction of the regional organics composting facility on the adjacent lot to the Landfill (Block J). The facility will be in operation in early 2023.
– The recycling facility will be upgraded in the summer of 2023.

4. Environmental Monitoring Program

The water quality monitoring program for the Site was developed based on previous water quality monitoring reports and the requirements for monitoring municipal landfills as provided in Guidelines for Environmental Monitoring and Municipal Solid Waste Landfills (BC MOE, 1996). The objective of the program is to identify potential impacts (if any) the Landfill has on the receiving groundwater and surface water.

Four water quality monitoring events were conducted during the Reporting Period: February, May, August, and November.

During the Reporting Period, water quality monitoring was conducted by GHD personnel with analytical services provided by Canadian Association for Laboratory Accreditation (CALA) accredited laboratory ALS Canada Ltd (ALS), located in Burnaby, BC. Additionally, a CVRD technician was trained during the third and fourth quarters to take over the field component of the EMP. Water quality monitoring locations are presented on Figure 2. Monitoring specifications including analytical parameters and monitoring frequency for 2022 are included in Appendix E.

5. Groundwater Monitoring Program

The objective of the groundwater monitoring program is to monitor groundwater quality within the Site area and to identify, if any, the extent, magnitude, and temporal trends of Landfill-derived impacts to groundwater quality.

The field component of the groundwater monitoring program consists of both hydraulic monitoring and groundwater sampling at 22 locations in the Site area. Groundwater monitoring wells (MWs) are located as shown in Figure 2. The 2022 groundwater monitoring program included sampling individual monitoring wells as follows:

– Background wells:
  - Shallow: AM02-01
  - Deep: MW01-16
– Landfill Vicinity wells, which are located within the Landfill footprint or on/near the Site boundary adjacent to the Landfill footprint. For the purpose of discussion in this Annual Report, the Landfill Vicinity wells are further divided between their screened locations in the shallow (<15 metres below the water table) or deep portions (>15 metres below the water table) of the overburden aquifer:
  - Shallow: EBA04-7, HBT94-1, HBT94-3
  - Deep: EBA04-1, EBA04-6, HBT94-2

It should be noted that EBA04-1 is sampled from a tap near the Site scale house located upgradient of the estimated limit of waste, however it has been grouped with the Landfill Vicinity wells for assessment purposes due to its proximity to the estimated limit of waste of the Landfill.

– Block J Vicinity wells, which are located northeast and cross-gradient of the Landfill. The Block J Vicinity wells are further divided between their screen locations in the shallow or deep portions of the overburden aquifer:
    - Shallow: AG99-06, EBA11-1, EBA11-3, EBA11-4
    - Deep: MW04-19, MW08-21
– Downgradient Off-Site wells, which are located east and southeast of the Landfill. The Downgradient Off-Site wells are further divided between their screen locations in the shallow or deep portions of the overburden aquifer:
    - Shallow: MW02-18, MW03-18, MW06-21, MW07-21
    - Deep: AG99-01, AG99-02, AG99-04, AG99-05

Groundwater samples were collected quarterly in 2022, with the following exceptions:

- HBT94-3 was dry during all monitoring events.
- HBT94-1 was dry in the February event.
- AM02-01 was dry during the February, May and November monitoring events. AM02-01 has historically been dry during most monitoring events.

Well completion details including screened intervals for each groundwater monitoring well are included in Table 3.

5.1 Surface Water Monitoring Program

The objective of the surface water monitoring program is to identify the extent, magnitude (if any) and temporal trends of potential Landfill-derived impacts to surface water quality.

Surface water monitoring locations are located downstream from the Site, as shown on Figure 2. The 2022 surface water monitoring program included sampling of three surface water monitoring locations as follows:

– SW-1 is located on an ephemeral tributary of Cold Creek, which drains into the Quinsam River. SW-1 was sampled during the February, May, and November monitoring events.
    - SW-1 was not sampled in August 2022 as it was dry.
– SW03-17 is located on a pond approximately 1 km east of the Site. This pond sometimes drains into to the same ephemeral tributary of Cold Creek that SW-1 is located on. SW03-17 was sampled during the May, August, and November sampling events.
    - SW03-17 was not sampled in February 2022 as it was frozen.
– SWM Pond is located on Site in Block J, northeast of the Landfill. The SWM Pond was only sampled during the November sampling event. Sampling was not possible during the February, May, and August sampling events as the location was dry.

5.2 Leachate Monitoring Program

As there is no leachate collection system at the Site, no leachate monitoring program is currently in place. The Site was originally developed as a natural attenuation landfill.

5.3 Sampling Methodology

Groundwater sampling was conducted in general accordance with BC Field Sampling Manual (MOE, 2013) and consisted of the following methodology:

– Well identification and inspection.
– Water level monitoring followed by well volume calculation.
– Well purging and stabilization monitoring. Purging was completed using a dedicated bailer or dedicated Waterra™ tubing. A minimum three well volumes were purged at wells with good recovery. Wells with insufficient

yield were purged dry and allowed to recover followed by sample collection. Field measurements included pH, conductivity, temperature, turbidity, and oxidation-reduction potential.

– Sample collection using dedicated sampling equipment (bailer or Waterra™).
– Equipment decontamination.

Surface water samples were collected by directly dipping a pre-cleaned unpreserved sample container below the water surface and then transferring to the appropriate preserved container when necessary. Field measurements included pH, conductivity, temperature, turbidity, oxidation-reduction potential, and dissolved oxygen.

Sampling of the domestic well on Site was completed by purging for a period of 20-minutes from an outside tap followed by direct sample collection. Field measurements collected included pH, conductivity, temperature, turbidity, and oxidation-reduction potential.

All samples were collected in the appropriate laboratory-supplied sample containers, preserved as required, packaged in an ice-chilled cooler, and delivered to the laboratory under chain-of-custody protocol. Groundwater samples designated for dissolved metals analysis were field filtered when possible.

5.4 Quality Assurance/Quality Control

In order to ensure adequate quality control for water quality samples, the following quality assurance/quality control (QA/QC) practices were employed during the Reporting Period:

– Activities performed by qualified and trained personnel.
– Daily field equipment calibration.
– Field QA/QC practices included field duplicate, field blank and trip blank analysis.

5.5 Laboratory Program

Analytical services for the EMP were provided by ALS of Burnaby, BC. ALS is accredited by the Canadian Association for Laboratory Accreditation (CALA) to perform the analytical tests required as part of the EMP. Field sample keys (FSK) and laboratory reports for each monitoring event are provided in Appendix F.

5.6 Data Quality Assessment and Verification

A qualified chemist completed data verification to assess laboratory and field QA/QC measures. The QA/QC memorandum presented in Appendix G indicates that data exhibited acceptable levels of accuracy and precision with the qualifications noted. All data reported for the 2022 EMP program has been determined to be acceptable for use in support of further analysis and interpretation in this Annual Report.

6. Environmental Monitoring Program Results and Trend Analysis

6.1 Water Level Monitoring

Results of the groundwater monitoring program (as detailed in Section 4.1) are presented in Table 3. Groundwater elevation data between 2014 and 2022 are presented as hydrographs in Appendix H. Groundwater contours for May and November 2022 are presented on Figures 6 and 7 and represent the dry and wet seasons, respectively.

Site water table was found to fluctuate seasonally between 19.98 to 21.55 m below top of riser (BTOR) with a median fluctuation of 1.55 m over the four monitoring events.

Consistent with historical inferred groundwater flow, groundwater was inferred to flow towards the east across the Site.

Vertical groundwater gradients were calculated for nested well pairs EBA04-6/EBA04-7 and MW03-18/AG99-05. A slight downward gradient during all four 2022 monitoring events at nested well pair EBA04-6/EBA04-7. At well pair MW03-18/AG99-05, a slight downward gradient was observed in February and May, and a slight upward gradient was observed in August and November.

Groundwater was observed to flow towards the east across the Site based on water levels measured during the Reporting Period, which is consistent with previous years. Site water table was found to fluctuate seasonally between 0.41 to 5.91 m with a median fluctuation of 1.55 m over the four monitoring events conducted in 2022. Groundwater elevations at the Site in 2022 were consistent with the elevations observed in 2021 and 2020. Groundwater elevations across the Site showed a decreasing trend between 2017 and 2019 but have since stabilized. Hydrographs showing groundwater elevation across the Site between 2014 and 2022 are presented in Appendix H.

6.2 Typical Leachate Indicator Parameters

The results of the water quality monitoring program are discussed in the following sections. Groundwater quality is assessed in terms of evidence of Landfill-related water quality impacts. This is accomplished through an assessment of the temporal and spatial trends in water quality and a comparison of water quality between each location, typical leachate concentrations, and background concentrations.

Assessment of groundwater and surface water quality at the Site employs indicator parameters that are indicative of leachate-impacted waters. As the Site does not have a leachate collections system or leachate monitoring wells to sample directly, the indicator parameters and their respective concentrations ranges are estimated using leachate quality monitoring data from MSW landfills of similar age ranges (approximately 10 to 15-years old).

Typical leachate indicator parameters concentration ranges for older MSW landfills are presented in Table 6.1 below.

Table 6.1 Typical Leachate Indicator Parameters Concentration Range

Parameter	Older MSW Landfills
Alkalinity	71 – 3,340(1)
Ammonia	84.3 – 449(1)
Boron	3.2 – 4.68(1)
Chloride	500(2)
Conductivity (µS/cm)	161 – 8,126(1)
Sulphate	50(2)
Iron	100 – 500(2)
Manganese	0.03 – 7.9(2)
TDS	2,000(2)

All concentrations in mg/L unless otherwise specified.
TDS – total dissolved solids; mg/L – milligrams per litre; µS/cm – microSiemens per centimetre.
[1] CRA, 2015.
[2] Mulamoottil, et. al, 1999.

Based on GHD's experience with similar MSW landfills, we consider the above values to be a realistic estimate of potential parameter concentrations in leachate at the Site. However, leachate characteristics can vary widely between landfills as well as landfill age, therefore, the example values are for comparison purposes only and cannot be used to definitively determine whether leachate impacts are present or not.

6.3 Groundwater Quality

The groundwater monitoring well network includes Background, Landfill Vicinity, Block J Vicinity, and Downgradient Off-Site monitoring wells.

Groundwater samples were collected from all monitoring wells quarterly in 2022, except dry or inaccessible wells. The monitoring events occurred February 21-22, May 23-24, August 22-23, and November 21-22, 2022.

Groundwater analytical results are presented in Tables 4 and 5. Analytical table notes are presented in Table 7. Summary tables of the leachate indicator parameter concentration ranges at each location are included in Appendix I.

Concentration versus time (C. vs. T) plots of select leachate indicator parameters and vanadium, used to support a temporal assessment of leachate impacts, are presented in Appendix J. Vanadium is included in the C vs. T plots to visualize its temporal trends, which includes seasonal exceedances of the applicable CSR standard.

The following sections provide an analysis of water quality following an upgradient to downgradient pattern, divided by geographic areas.

6.3.1 Background Groundwater Quality Results

Based on groundwater flow direction and historical groundwater chemistry, background monitoring wells include AM02-01 and MW01-16. Both monitoring wells are located upgradient, west of the Landfill footprint (Figure 2) and are screened in the shallow and deep portion of the overburden aquifer, respectively.

The 2022 analytical results for samples collected from the background monitoring wells are summarized in Tables 4 and 5. Summary tables including current leachate indicator parameter concentration ranges are included in Appendix I (Table I-1). C vs. T plots of the leachate indicator parameters were used to support this assessment and are presented in Appendix J (Figures J-1 and J-2).

Background water quality in both the shallow and deep portions of the overburden aquifer is characterized by low concentrations of the leachate indicator parameters. The following observations of background groundwater quality are made based on historic and current analytical data as well as the C vs. T plots:

– Water quality in the shallow aquifer appears to have an increase in alkalinity, chloride, and conductivity concentrations and a decrease in sulphate concentrations. AM02-1 has limited analytical data to date, as such it is unknown if this will be a long-term trend.
– Leachate indicator parameter concentrations are, overall, stable in the deep portion of the overburden aquifer.

Samples collected from AM02-01 and MW01-16 are inferred to be representative of background groundwater quality.

6.3.2 Landfill Vicinity Groundwater Quality Results

The Landfill Vicinity wells are installed at the property boundary in the immediate vicinity of the Landfill and immediately downgradient of the Landfill footprint (Figure 3). These monitoring wells represent Site compliance with respect to Landfill-derived impacts migrating off-Site.

The Landfill Vicinity wells network includes:

– Shallow: EBA04-7, HBT94-1, HBT94-3
– Deep: EBA04-1 (tap), EBA04-6, HBT94-2

The 2022 analytical results for samples collected from these monitoring wells are summarized in Tables 4 and 5. Based on the concentrations of leachate indicator parameters (Appendix I, Table I-2) and C vs. T plots (Appendix J, Figures J-3 and J-4), the following is inferred:

– Leachate indicator parameter concentrations in the Landfill Vicinity wells are, with the exception of EBA04-1, consistently greater than background which indicates the presence of Landfill-derived impacts.

– Concentration of leachate indicator parameters at EBA04-01 are generally comparable to background, with the only exceptions being dissolved iron and vanadium concentrations.
– The C vs. T plots show recent increasing trends of conductivity, dissolved manganese, and sulphate at EBA04-07. All other parameters are, overall, consistent with no clear increasing or decreasing trends.

Overall, impacts are most pronounced at EBA04-07, located in shallow portion of the aquifer northeast of the waste mound. Impacts are generally more pronounced in the shallow monitoring well in each nested pair.

6.3.3 Block J Vicinity Groundwater Quality Results

The Block J Vicinity wells are installed at the Site's property boundary in the immediate vicinity of Block J (Figure 3). These monitoring wells are located in a cross-gradient position to the Landfill. These monitoring wells represent Site compliance with respect to Landfill-derived impacts migrating off-Site.

The Block J Vicinity wells network includes:

– Shallow: AG99-06, EBA11-1, EBA11-2, EBA11-3, EBA11-4
– Deep: MW04-19, MW08-21

The 2022 analytical results for samples collected from these monitoring wells are summarized in Tables 4 and 5. Based on the concentration of leachate indicator parameters (Appendix I, Tables I-3 and I-4) and C vs. T plots (Appendix J, Figures J-5 to J-8), the following is inferred:

– Concentrations of leachate indicator parameters at EBA11-1 are significantly elevated relative to background groundwater quality and the other Block J monitoring wells. Groundwater quality at EBA11-1 is likely affected by the infiltration of leachate impacted surface water in the SWM Pond.
– Non-metal leachate indicator parameters at the remaining Block J Vicinity wells were slightly elevated above background in 2022. The concentration of vanadium has consistently been above background at MW04-19.
– Concentrations of sulphate spiked notability in late 2022 in EBA11-4. No other leachate indicator parameters showed a comparable trend at EBA11-4 during this time.
– With the exception of EBA11-1, leachate indicator parameter concentrations at the Block J Vicinity wells have been consistent over time and are similar to background groundwater quality.

Concentrations of leachate indicator parameters increased significantly at EBA11-1 in late 2019 following the commissioning of the SWM Pond. Surface water that has been impacted by leachate seeps is directed to the SWM Pond where it infiltrates to the subsurface. Prior to construction of the pond in 2019, leachate impacted surface water travelled down the surface water ditch adjacent to Argonaut Road. As shown in Figures 6 and 7, the Block J Vicinity wells are located cross-gradient to the inferred groundwater flow path from the landfill, but are directly downgradient from the SWM Pond.

Continued monitoring is recommended to observe the evolution of water quality at the Block J monitoring wells. It is anticipated that groundwater quality at EBA11-1 will improve now that the final cover has been applied to the Landfill. These measures will minimize precipitation infiltration to the Landfill, resulting in a significantly lower rate of leachate generation. The final cover will also significantly increase the clean surface water runoff from the landfill footprint that flows to the pond resulting in increased infiltration of clean surface water upgradient of EBA11-1.

6.3.4 Downgradient Off-Site Groundwater Quality Results

The Downgradient Off-Site wells are the monitoring wells installed outside of the Site's property boundary and downgradient, east, and southeast, of the Landfill (Figure 3). These monitoring wells represent Site compliance with respect to Landfill-derived impacts migrating off-Site.

The Downgradient Off-Site wells network includes:

– Shallow: MW02-18, MW03-18, MW06-21, MW07-21
– Deep: AG99-01, AG99-02, AG99-04, AG99-05

The 2022 analytical results for samples collected from these monitoring wells are summarized in Tables 4 and 5. Based on the concentration of leachate indicator parameters (Appendix I, Tables I-5 and I-6) and C vs. T plots (Appendix J, Figures J-9 to J12) the following is inferred:

– Elevated leachate indicator parameter concentrations are most apparent at shallow monitoring well, MW02-18. Concentrations of alkalinity, chloride, conductivity, TDS, iron, and manganese are elevated well above background.
– Concentrations of alkalinity, conductivity, TDS, and vanadium are slightly elevated at the remaining Downgradient Off-Site wells while concentrations of chloride, iron, manganese, and sulphate are generally comparable.
– Leachate indicator parameter concentrations at MW02-18 have been variable over the past several years but do not show any obvious increasing or decreasing trends.
– Concentrations are generally consistent at the remaining Downgradient Off-Site wells.

Overall, the monitoring results from the Downgradient Off-Site wells show Landfill-derived impacts are present at the shallow monitoring well MW02-18. Results from the remaining wells show that minor impacts may be present but are generally limited and are not worsening.

Figure 2 illustrates the approximate location of an historical dumping area. MW02-18 is located within the dumping area. Impacts noted at MW02-18 may be from a combination of the Landfill and historical dumping.

6.4 Groundwater Geochemical Characteristics

Figure 10 presents a trilinear piper plot for groundwater and surface water monitoring locations using analytical data from the November 2022 monitoring event.

The plot provides a means of comparing geochemical fingerprints between monitoring locations. Major cation and anion concentrations are plotted on trilinear (triangular) diagrams as percentages and geochemical patterns can be discerned by comparing the relative locations of samples on the plot. Locations that plot close to one another are characterized by similar major ion geochemistry and vice versa.

For the purposes of this assessment, the piper plot has been employed as an additional line of evidence to support identification of regions where potential MSW Landfill-derived impacts on groundwater may have occurred. Based on GHD's experience with similar MSW landfills, leachate typically plots in the central portion of a piper plot. Conversely, unimpacted groundwater typically plots in the left corner.

The following observations are drawn based on Figure 10:

– Background monitoring wells and the majority of the groundwater monitoring wells plot in the leftmost corner of the diamond. This is inferred to represent un-impacted groundwater and shows that the major ion chemistry of the majority of locations are similar to background.
– Block J Vicinity monitoring well EBA11-1 plots is upwards and to the right of cluster of un-impacted wells. This indicates that the geochemical fingerprint of this well has been altered. Based on the location of EBA11-1, cross-gradient of the landfill and downgradient of the SWM POND, groundwater impacts are inferred to be due to infiltration of leachate impacted surface water in SWM Pond rather than impacts from the Landfill.
– Landfill Vicinity and Downgradient Off-Site wells HBT94-2, HBT94-1, and MW02-18 plot in locations shifted towards the central portion of the diamond. This shows that the geochemistry at these locations may have been influenced by Landfill leachate. It is noted that the shift between background and the Landfill Vicinity wells is not significant. This indicates that the difference in geochemical fingerprints (i.e., major ion proportions) and leachate impacts are minor.

6.5 Surface Water Quality

The surface water monitoring network includes two off-Site monitors located approximately 1.1 and 1 km east, downgradient, of the Site, Cold Creek tributary (SW-1) and Unnamed Pond (SW03-17) as well as the SWM Pond located on the Block J property. The surface water monitoring locations are presented on Figure 2.

Surface water samples at SW-1 and SW03-17 were collected quarterly in 2022. The monitoring events occurred February 22, May 23, August 23, and November 22, 2022. Surface water samples were collected at the SWM Pond on November 22, 2022. The SWM Pond was dry during the other monitoring events in 2022. SW-1 was dry during the August 2022 event and SW03-17 was dry during the February 2022 event.

Water quality results were assessed for evidence of Landfill-derived impacts. Surface water analytical results are presented in Table 6 and analytical table notes are presented in Table 7. Summary tables including current leachate indicator parameter concentration ranges are included in Appendix I (Table I-7). C vs. T plots of the leachate indicator parameters were used to support this assessment and are presented in Appendix J (Figures J-13 and J-14).

Figure 10 presents a trilinear piper plot for select groundwater and surface water monitoring locations using analytical results from the November 2022 monitoring event.

At this time, monitoring of background surface water conditions is not conducted for the Site as an appropriate background surface water monitoring location does not appear to exist in the vicinity of the Site. Surface water quality at the Site is assessed based on concentrations of leachate indicator parameters in surface water and the assumption that background surface water quality at the Site is similar to background groundwater quality at AM02-01 and MW01-16.

Leachate indicator parameter concentrations in SW-1 and SW03-17 are generally comparable to or lower than background groundwater quality with the exception of iron, manganese, and very slightly elevated chloride. In the absence of other elevated parameters, elevated concentrations of iron and manganese are interpreted to be due to natural variation between background groundwater and downgradient surface water. Slightly elevated chloride may be due to road-salt or natural variation.

Leachate indicator parameter concentrations at the SWM Pond are notably elevated in comparison to background groundwater quality. This provides evidence that surface water in the SWM Pond has been influenced by the Landfill.

The following observations are drawn based on the Piper Plot presented on Figure 10:

– Surface water quality in SWM Pond, plots in the upper right portion of the diamond which indicates significant alteration of the geochemical fingerprint when compared to background groundwater. Considering the elevated concentrations and changes to major ion percentages, Landfill-derived impacts are interpreted to be present.
– Surface water quality in SW-1 and SW03-17 plot in a location away from the background, un-impacted locations. This is not, however, interpreted to be related to Landfill-derived impacts. As shown above and in Table 6, concentrations of general chemistry and metals ions are very low in in both SW-1 and SW03-17. Thus, the slightly elevated chloride results in a large shift on the Piper Plot. This is due to the very low concentration and not Landfill-impacts.

As previously discussed, there is no direct surface water discharge from the Site to the ephemeral tributaries east of the Site. The depth of groundwater in the vicinity of the tributaries is unknown and as such the discharge of groundwater to the tributaries cannot be confirmed without further investigation. However, there is no evidence of Landfill impacts, so additional investigation is not warranted at this time.

7. Compliance Assessment

A compliance assessment of groundwater analytical concentrations at the Site was completed using the following applicable BC Contaminated Sites Regulation (CSR) standards:

– Schedule 3.2 Generic Numerical Water Standards Column 3 for the protection of freshwater aquatic life (FAW)
– Schedule 3.2 Generic Numerical Water Standards Column 6 for the protection of drinking water (DW)

A compliance assessment of surface water analytical concentrations at the property boundary monitoring locations were completed using the following applicable WQGs:

– Approved, Working and Source WQG's for drinking water (DW) and freshwater aquatic life (FAW)

7.1 Groundwater

Background groundwater (AM02-01 and MW01-16) analytical results were less than the applicable CSR standards during all four monitoring events in 2022.

The following parameter concentrations were greater than background concentrations and their applicable CSR standards (Tables 4 and 5) during one or more 2022 monitoring events:

– AG99-02: dissolved vanadium
– EBA11-1: nitrate, nitrite/nitrate
– HBT94-1: ammonia, dissolved manganese
– HBT94-2: ammonia
– MW02-18: ammonia, dissolved manganese

As discussed in the preceding sections, Landfill-derived impacts have been identified in the Landfill Vicinity wells. The observed CSR exceedances of dissolved manganese at HBT94-1 are inferred to be Landfill-related. It is unclear what portion of impacts at MW02-18 can be attributed to the Landfill versus the historic dumping area, however, the Landfill cannot be ruled out as at least a partial contributor to the CSR exceedances observed at this monitoring well. As discussed in Section 5.3.3, CSR exceedances at EBA11-1 are inferred to be due to the infiltration of impacted surface water from SWM Pond, rather than Landfill-derived impacts.

Concentrations of vanadium at AG99-02 have consistently exceeded or come close to exceeding CSR standards. One exceedance occurred in 2022, during the August 2022 monitoring event. The source of elevated vanadium at this well is unknown, but as elevated vanadium concentrations have not been observed in other leachate impacted monitoring wells, the elevated vanadium concentrations at AG99-02 are not inferred to be caused by Landfill-derived impacts.

7.2 Surface Water

The surface water monitoring network includes three surface water locations (SW-1, SW03-17 and SWM Pond) (Figure 2). Analytical results from SW-1 and SW03-17 were compared to WQGs. Analytical results from the SWM Pond were compared to CSR standards, per the OC.

The following parameters were reported in greater concentrations than their applicable WQGs (Table 6a) and CSR standards (Table 6b) during one or more 2022 monitoring events at the following monitoring wells:

– SW-1: field pH, field temperature, total alkalinity, dissolved aluminum, manganese
– SW03-17: field temperature, total alkalinity, manganese
– SWM Pond: nitrate, nitrite/nitrate

Elevated concentrations of parameters indicative of Landfill-derived impacts were not identified at SW-1 or SW03-17. As such, CSR exceedances at both locations were inferred to be due to natural surface water quality. At SW-1, field

pH was below the WQG for FAW through the February, May and August monitoring events, indicating more acidic water in the Cold Creek tributary during this period. This corresponds well with low alkalinity reported at in SW-1 and SW03-17 which is due to natural causes.

As previously discussed, Landfill-derived impacts are noted within the SWM Pond. Consequently, exceedances of CSR standards in the SWM Pond appear to be attributed to the Landfill. After Landfill closure and application of the final cover, the pond will receive runoff from the final cover system and will thus no longer be impacted by leachate seeps from the Landfill side slopes. It is anticipated that this will improve surface water quality as well as groundwater quality in the vicinity of the SWM Pond.

8. Summary

The following summarizes the findings of the Annual Report:

Site Operations

– The CRWMC Landfill reached capacity and ceased disposal of waste in May 2022. The Site now operates as a transfer station, with all MSW transferred to the Comox Valley Waste Management Centre (CVWMC) for disposal.
– Full closure of the Landfill was undertaken in 2022, with the installation of 31 vertical LFG wells and a LLDPE geomembrane cover.
– Approximately 25,303 tonnes of material were received from the Campbell River wasteshed, of which, 1,393 tonnes of non-MSW materials were diverted by customers, and 23,910 tonnes of MSW were accepted. Of that, 21,209 tonnes of MSW were transferred to the CVWMC, and 2,201 tonnes of MSW was landfilled at the CRWMC in 2022. An additional 4,963 tonnes of recycled/diverted materials and 1,067 tonnes of clean fill were received, as measured over the scale.

Groundwater Flow Patterns

– Groundwater was observed to flow towards the east across the Site.
– Site water table was found to fluctuate seasonally between 0.41 to 5.91 m with a median fluctuation of 1.55 m.
– Groundwater elevations at the Site in 2022 were consistent with the elevations observed in 2021 and 2020. Groundwater elevations across the Site showed a decreasing trend between 2017 and 2019 but have since stabilized.

Groundwater Quality

– No Landfill-derived impacts were observed in groundwater quality at background monitoring wells AM02-1 and MW01-16.
– Leachate impacts continue to be observed in groundwater at monitoring wells located in the Landfill Vicinity monitoring wells EBA04-6, EBA04-7, HBT94-1, and HBT94-2. Dissolved manganese concentrations were greater than the CSR DW standards during the August and November monitoring events in 2022 at HBT94-1.
– Concentrations of leachate indicator parameters at EBA11-1 are significantly elevated relative to background groundwater quality and the other Block J monitoring wells. Groundwater quality at EBA11-1 is likely affected by the infiltration of leachate impacted surface water in the SWM Pond.
– With the exception of EBA11-1, groundwater quality results from the Block J Vicinity wells are stable and do not show landfill-derived groundwater impacts.
– Ammonia and dissolved manganese concentrations at MW02-18 were greater than the applicable CSR standards throughout 2022. It is noted that monitoring well MW02-18 is located adjacent to a historic dumping ground, therefore, impacts noted at MW02-18 may be from a combination of the Landfill and historical dumping.

- Deep downgradient groundwater quality southeast of the Site at AG99-01, AG99-02, AG99-04, and AG99-05 remains generally stable over time with minimal leachate impacts observed.
- The source of vanadium in groundwater quality at AG99-02 is not known at this time but is unlikely related to Landfilling activities.
- It is anticipated that groundwater quality at EBA11-1 will improve now that the final cover has been applied to the Landfill. These measures will minimize precipitation infiltration to the Landfill, resulting in a significantly lower rate of leachate generation. The final cover will also significantly increase the clean surface water runoff from the landfill footprint that flows to the SWM Pond resulting in increased infiltration of clean surface water upgradient of EBA11-1. The cover will also prevent any leachate seeps from mixing with surface water and being directed to the SWM Pond.

Surface Water Quality

- Based on the results of surface water quality monitoring conducted in 2022 at SW-1 (tributary of Cold Creek), and SW03-17 (unnamed pond upstream of SW-1) the presence of leachate impacts is not suspected.
- The SWM Pond was sampled in November 2022. Water quality in the SWM Pond appears to be impacted by Landfill activities, with concentrations of several leachate indicator parameters similar to typical MSW leachate. Water quality in the SWM Pond has been affected by discharge from the side slope seeps which had been re-routed from Argonaut Road.
- It is anticipated that surface water quality in the SWM Pond will improve now that the final cover has been applied to the Landfill. These measures will minimize precipitation infiltration to the Landfill, resulting in a significantly lower rate of leachate generation. The final cover will also significantly increase the clean surface water runoff from the landfill footprint that flows to the SWM Pond. The cover will also prevent any leachate seeps from mixing with surface water and being directed to the SWM Pond.

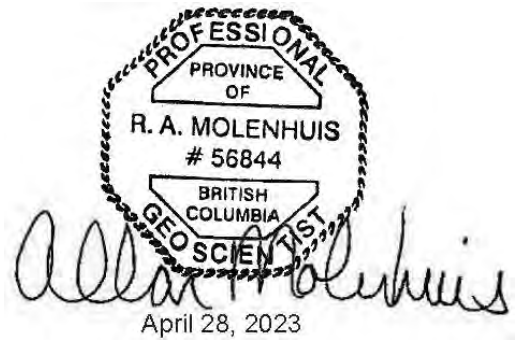
9. Recommendations

Based on the findings of the Annual Report, the following recommendations are made:

- Continue the groundwater and surface water monitoring programs (Appendix K) on a quarterly basis.
- Install the LFG blower and flare and commission the LFG collection and management system.
- Complete the landfill gas monitoring program as described in the Closure Plan

All of Which is Respectfully Submitted,

GHD



April 28, 2023

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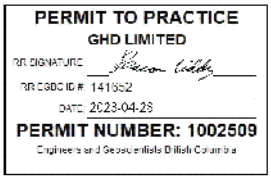

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Tables

Table 1
Waste Tonnage and Diversion
2022 Operations and Monitoring Report
Campbell River Waste Management Centre
Comox Strathcona Waste Management

	Units	2022
WASTE DISCHARGED TO LANDFILL (1)		
Waste from CRWMC Wasteshed		
Construction Waste	tonnes	1598
ICI & Household	tonnes	18132
Municipal Waste by Contract	tonnes	4586
Volunteer Clean Up	tonnes	17
Asbestos	tonnes	134
Streetside cleanup/illegal dumping	tonnes	2
Mattresses	tonnes	183
Clean Fill - Disposed	tonnes	652
Subtotal		***25303***
Non-MSW materials diverted from mixed loads (2)		*1393*
Total MSW accpeted at CRWMC in 2022		*23910*
MSW Transferred to CVWMC for disposal		*21709*
Total MSW Discharged to Landfill		**2201**
RECYLED/DIVERTED MATERIAL (1)		
Yard Waste	tonnes	0
Commercial Cardboard/Recycling	tonnes	22
Scrap Metal Sales	tonnes	881
Battery Sales	tonnes	29
Clean Wood Waste	tonnes	0
Drywall/Gypsum waste	tonnes	520
Cut Grass & Raked Leaves	tonnes	778
Outbound transfer of wood waste	tonnes	2732
Total Recycled/Diverted Material		**4963**
Clean fill used as cover		1067
Total Material Diverted		**6030**

Notes:

(1) Campbell River Waste Management Centre Yearly Tonnage Summary

(2) Non-MSW materials diverted by customers after passing over the scale

CRWMC - Campbell River Waste Management Centre

CVWMC - Comox Valley Waste Management Centre

MSW - Municipal Solid Waste

Table 2

Waste Area Population and Projected Population
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Year	Estimated Population[1][2]
2022	47,761
2023	48,172
2024	48,586
2025	49,004

Notes:

[1] 2021 population sourced from Stats Canada for City of Campbell River, Village of Sayward, Village of Gold River, Strathcona electoral areas A, B, C, and D, and adjacent IRs

[2] Average Annual population growth rate of 0.86% (Stats Canada, 2021)

Table 3

Well Completion Details and Hydraulic Monitoring
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Location	Coordinates		Top of Riser Reference Elevation	Total Depth of Well	Screened Interval				Screen Length	February 21-22, 2022		May 23-24, 2022		August 22-23, 2022		November 21-22, 2022		Screened Unit	Screened Lithology
					(m BTOR)		(m AMSL)			Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation	Depth to Water	Water Elevation		
	Northing (y)	Easting (x)	(m AMSL)	(m btor)	from	to	from	to	(m)	(m btor)	(m btor)	(m btor)	(m AMSL)	(m btor)	(m AMSL)	(m btor)	(m AMSL)		
MW01-16	5542073.127	331106.575	186.90	43.17	38.60	41.64	148.15	145.10	3.1	35.14	151.76	36.90	150.00	32.24	154.66	38.15	148.75	Shallow overburden	Sand and gravel
MW02-18	5542104.290	331913.490	138.79	32.66	31.14	32.66	107.65	106.13	1.5	23.27	115.52	24.83	113.96	25.50	113.29	24.50	114.29	Shallow overburden	Sand
MW03-18	5542306.040	332132.200	132.10	27.21	25.68	27.21	106.42	104.89	1.5	19.98	112.12	21.27	110.83	21.54	110.56	21.90	110.20	Shallow overburden	Sand and gravel
MW04-19	5542518.573	331969.010	136.32	36.12	32.31	35.36	104.01	100.96	3.1	15.93(1)	120.39(1)	24.29	112.03	24.64	111.68	24.12	112.20	Shallow overburden	Silty sand
MW06-21	5542011.922	331957.118	139.63	32.92	29.87	32.92	109.76	106.71	3.1	25.48	114.15	26.83	112.80	27.16	112.47	26.37	113.26	Shallow overburden	Silty Sand
MW07-21	5542197.335	332069.071	135.33	30.48	26.52	29.57	108.81	105.76	3.1	22.43	112.91	23.78	111.55	23.98	111.35	23.32	112.01	Shallow overburden	Gravel and sand
MW08-21	5542475.019	332003.177	134.81	42.67	37.49	40.54	97.32	94.27	3.1	22.43	112.38	23.74	111.07	23.96	110.85	23.33	111.48	Deep overburden	Sand
AG99-01	5542063.675	331815.529	144.19	48.50	46.50	48.50	97.69	95.69	2.0	28.87	115.32	30.12	114.07	30.25	113.94	28.60	115.60	Deep overburden	Gravel
AG99-02	5542017.821	331937.280	139.85	51.51	49.00	51.00	90.85	88.85	2.0	25.73	114.12	27.08	112.77	27.27	112.58	26.62	113.23	Deep overburden	Gravel, some sand and cobbles
AG99-04	5542190.662	332048.523	136.44	45.42	38.00	45.00	98.44	91.44	7.0	22.65	113.79	24.00	112.44	24.19	112.25	23.54	112.90	Deep overburden	Gravel, some sand and cobbles
AG99-05	5542314.710	332133.846	132.09	50.90	44.00	50.00	88.09	82.09	6.0	20.01	112.08	21.31	110.78	21.55	110.54	20.93	111.16	Deep overburden	Sand, trace silt
AG99-06	5542635.565	332073.874	132.69	45.11	22.00	25.00	110.69	107.69	3.0	21.58	111.11	22.17	110.52	23.14	109.56	22.98	109.72	Shallow overburden	Sand, trace silt
AM02-01	5542076.112	331105.831	186.86	33.20	19.00	34.00	167.86	152.86	15.0	DRY	DRY	DRY	DRY	32.16	154.70	DRY	DRY	Shallow overburden	Sand
EBA04-1	-	-	-	-	-	-	-	-	-	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	Deep overburden	Sand and gravel
EBA04-6	5542397.539	331952.509	136.34	39.60	38.10	39.60	98.24	96.74	1.5	24.27	112.07	25.67	110.67	25.83	110.51	25.19	111.15	Deep overburden	Sand and gravel
EBA04-7	5542370.669	331954.022	136.40	32.00	30.50	32.00	105.90	104.40	1.5	24.18	112.22	25.59	110.82	25.76	110.65	25.12	111.29	Shallow overburden	Sand and gravel
EBA11-1	5542468.941	331995.662	134.77	28.96	25.60	28.70	109.17	106.07	3.1	21.36	113.42	22.05	112.72	23.19	111.58	23.14	111.63	Shallow overburden	Sand, trace/some silt
EBA11-3	5542801.160	332038.159	134.19	30.18	27.10	30.18	107.09	104.01	3.1	22.47	111.72	23.01	111.18	23.69	110.50	22.13	112.06	Shallow overburden	Sand, trace gravel
EBA11-4	5542698.635	332061.625	133.13	29.57	25.90	29.00	107.23	104.13	3.1	22.45	110.68	23.14	109.99	23.88	109.26	23.52	109.62	Shallow overburden	Sand, trace gravel, trace/some silt
HBT94-1	5542161.126	331798.592	141.98	34.00	31.00	34.00	110.98	107.98	3.0	DRY	DRY	27.52	114.47	27.93	114.05	OBSTRUCTION[2]	OBSTRUCTION[2]	Shallow overburden	Sand, trace silt and gravel
HBT94-2	5542157.473	331796.264	142.05	44.00	41.00	43.00	101.05	99.05	2.0	27.81	114.24	27.55	114.50	28.15	113.90	27.01	115.04	Deep overburden	Sand, some silt
HBT94-3	5542148.604	331791.155	142.26	27.00	25.00	27.00	117.26	115.26	2.0	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	Shallow overburden	Gravel

Notes:

(1) The depth to water measured at MW04-19 in February 2022 was likely a measurement error.

(2) Depth to water at HBT94-1 could not be measured in November 2022 due to a tubing obstruction. The obstruction was removed and a sample was collected.

m metre

m BTOR metres below top of riser

m AMSL metres above mean sea level

\- not measured/data unavailable

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				AG99-01				AG99-02			
Sample ID:		BC CSR Schedule 3.2		WG-11209296-220222-MJ-14	WG-11209296-240522-NT-15	WG-11209296-220822-NT-03	WG-11209296-211122-NT-03	WG-11209296-220222-MJ-18	WG-11209296-240522-NT-17	WG-11209296-230822-NT-11	WG-11209296-211122-NT-06
Sample Date:				02/22/2022	05/24/2022	08/22/2022	11/21/2022	02/22/2022	05/24/2022	08/23/2022	11/21/2022
Parameters	Units	DW a	FAW b								
Field Parameters											
Conductivity, field	uS/cm	--	--	171	232	225	168	280	195	142	151
Oxidation reduction potential (ORP), field	millivolts	--	--	252	168	292	169	325	196	259	146
pH, field	s.u.	--	--	8.32	7.85	7.74	8.04	8.43	8.37	8.47	8.61
Temperature, field	Deg C	--	--	8.76	11.27	13.87	11.00	9.74	12.20	13.41	10.48
Total dissolved solids, field (TDS)	mg/L	--	--	111	151	146	109	182	127	97	98
Turbidity, field	NTU	--	--	2.5	9.9	7.3	6.6	0.0	0.6	0.9	9.1
General Chemistry											
Alkalinity, bicarbonate	mg/L	--	--	92.9	115	117	98.9	152	100	78.3	87.7
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	11.6	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	92.9	115	117	98.9	164	100	78.3	87.7
Chloride (dissolved)	mg/L	250	1500	1.43	2.25	3.69	3.34	1.51	1.31	1.69	1.74
Conductivity	uS/cm	--	--	188	227	245	209	306	202	164	185
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	89.3	121	114	96.9	168	93.9	76.2	85.6
Sulfate (dissolved)	mg/L	500	[b]	2.98	3.09	3.18	3.18	2.14	2.32	2.72	2.57
Total dissolved solids (TDS)	mg/L	--	--	100	144	169	133	181	109	110	118
Nutrients											
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.127	0.228	0.291	0.202	0.203	0.149	0.195	0.177
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.127	0.228	0.291	0.202	0.203	0.149	0.195	0.177
Dissolved Metals											
Aluminum (dissolved)	ug/L	9500	--	3.2	2.6	9.5	1.9	5.2	4.3	5.1	3.8
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.92	0.77	0.68	0.74	1.88	2.03	2.29	1.92
Barium (dissolved)	ug/L	1000	10000	1.82	2.7	2.4	1.9	7.78	4.65	4.13	4.17
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	5	[b]	0.0119	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	28900	39200	36700	31700	52300	29500	23400	26600
Chromium (dissolved)	ug/L	50	10	0.54	ND (0.5)	0.52	0.56	0.68	0.54	0.5	0.51
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	0.58	ND (0.2)	0.2	ND (0.2)	0.65	ND (0.2)	ND (0.2)	ND (0.2)
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	4170	5640	5410	4320	9010	4920	4320	4650
Manganese (dissolved)	ug/L	1500	--	0.15	ND (0.1)	0.74	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.152	0.114	0.092	0.133	0.1	0.178	0.137	0.101
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	728	754	856	747	1560	1240	1130	1080
Rubidium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Selenium (dissolved)	ug/L	10	20	0.121	0.107	0.134	0.103	0.096	0.172	0.19	0.168
Silicon (dissolved)	ug/L	--	--	6430	6550	6320	5900	6500	5720	5760	5640
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	1890	2170	2180	1870	1940	1460	1420	1440
Strontium (dissolved)	ug/L	2500	--	46.8	62.4	61.5	52.8	65.5	39.4	30.6	34.1
Sulphur (dissolved)	ug/L	--	--	860	1040	820	540	560	870	800	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.082	0.097	0.094	0.09	0.388	0.187	0.115	0.129
Vanadium (dissolved)	ug/L	20	--	6.2	5.38	5.29	5.33	19	19.4	21.1[a]	19.2
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
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Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				AG99-04				AG99-05					
Sample ID:		BC CSR Schedule 3.2		WG-11209296-220222-MJ-16	WG-11209296-240522-NT-20	WG-11209296-230822-NT-16	WG-11209296-221122-NT-13	WG-11209296-220222-MJ-13	WG-11209296-230522-NT-03	WG-11209296-230522-NT-04	WG-11209296-230822-NT-12	WG-11209296-230822-NT-13	WG-11209296-221122-NT-17
Sample Date:				02/22/2022	05/24/2022	08/23/2022	11/22/2022	02/22/2022	05/23/2022	05/23/2022 Duplicate	08/23/2022	08/23/2022 Duplicate	11/22/2022
Parameters	Units	DW a	FAW b										
Field Parameters													
Conductivity, field	uS/cm	--	--	99	112	101	100	122	255	255	91	91	65
Oxidation reduction potential (ORP), field	millivolts	--	--	318	199	273	161	263	209	209	207	207	146
pH, field	s.u.	--	--	8.19	8.37	8.51	8.55	8.30	7.72	7.72	8.70	8.70	8.51
Temperature, field	Deg C	--	--	10.10	12.45	13.79	9.83	7.51	13.49	13.49	15.49	15.49	9.46
Total dissolved solids, field (TDS)	mg/L	--	--	64	73	66	65	79	166	166	59	59	42
Turbidity, field	NTU	--	--	0.0	0.6	0.0	1.7	10.0	1.3	1.3	0.6	0.6	1.8
General Chemistry													
Alkalinity, bicarbonate	mg/L	--	--	54.5	51.9	50.0	59.0	62.6	125	125	52.5	53.2	47.9
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	54.5	51.9	50.0	59.0	62.6	125	125	52.5	53.2	47.9
Chloride (dissolved)	mg/L	250	1500	1.29	1.63	1.53	1.30	1.74	6.59	6.55	1.25	1.24	1.11
Conductivity	uS/cm	--	--	114	116	109	127	132	254	255	110	112	102
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	53.6	51.3	51.4	55.3	63.2	131	130	52.3	54.9	47.6
Sulfate (dissolved)	mg/L	500	[b]	2.66	2.26	2.30	2.64	2.69	2.49	2.47	2.30	2.28	2.16
Total dissolved solids (TDS)	mg/L	--	--	64	57	85	90	74	158	154	86	85	77
Nutrients													
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.0972	0.122	0.144	0.156	0.0999	0.0860	0.0853	0.0678	0.0683	0.0945
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.0972	0.122	0.144	0.156	0.0999	0.0860	0.0853	0.0678	0.0683	0.0945
Dissolved Metals													
Aluminum (dissolved)	ug/L	9500	--	5.6	5.2	4.8	4.4	4	3.2 J	3 J	3.9	3.7	4.4
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.39	0.46	0.34	0.33	0.35	0.27	0.27	0.31	0.34	0.35
Barium (dissolved)	ug/L	1000	10000	0.9	0.89	0.68	0.81	0.93	1.92	1.94	0.79	0.77	0.7
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	17	17	28	30	12
Cadmium (dissolved)	ug/L	5	[b]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.0067	0.0066	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	18400	17800	17800	19000	21500	44400	44000	17900	18900	16200
Chromium (dissolved)	ug/L	50	10	ND (0.5)	ND (0.5)	0.67	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.13	0.14	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	0.82	0.3	0.24	ND (0.2)	0.34	1.95	1.76	0.32	0.32	ND (0.2)
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	1850	1660	1680	1910	2300	4830	4930	1840	1880	1750
Manganese (dissolved)	ug/L	1500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.153	0.124	0.119	0.099	0.128	0.073 J	0.075 J	0.147	0.144	0.145
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.22 J	0.57 J	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	320	313	264	289	423	583	582	370	376	364
Rubidium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Selenium (dissolved)	ug/L	10	20	0.073	0.118	0.095	0.127	0.085	0.332 J	0.255 J	0.091	0.134	0.065
Silicon (dissolved)	ug/L	--	--	4310	3940	3910	3790	4520	4620	4630	4250	4260	4030
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	1440	1330	1320	1370	1770	2190	2200	1320	1360	1650
Strontium (dissolved)	ug/L	2500	--	29.8	28.8	28.2	30.2	36.3	68.9	71.2	29.7	29.4	27.3
Sulphur (dissolved)	ug/L	--	--	660	760	890	ND (500)	620	690	800	680	880	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.024	0.024	0.025	0.033	0.039	0.132	0.131	0.039	0.041	0.027
Vanadium (dissolved)	ug/L	20	--	2.98	3.11	2.49	2.37	2.76	2.1	2.12	2.42	2.54	2.57
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
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Campbell River, British Columbia

Sample Location:				AG99-06				AM02-01	EBA04-1		
Sample ID:		BC CSR		WG-11209296-210222-MJ-06	WG-11209296-230522-NT-05	WG-11209296-230822-NT-18	WG-11209296-221122-NT-18	WG-11209296-230822-NT-06	WG-11209296-240522-NT-13	WG-11209296-220822-NT-02	WG-11209296-211122-NT-02
Sample Date:		Schedule 3.2		02/21/2022	05/23/2022	08/23/2022	11/22/2022	08/23/2022	05/24/2022	08/22/2022	11/21/2022
		DW	FAW								
Parameters	Units	a	b								
Field Parameters											
Conductivity, field	uS/cm	--	--	77	275	193	68	1090	88	75	54
Oxidation reduction potential (ORP), field	millivolts	--	--	260	230	290	151	336	188	251	205
pH, field	s.u.	--	--	7.06	7.52	7.64	8.41	7.03	8.25	8.57	7.40
Temperature, field	Deg C	--	--	5.26	11.49	13.66	8.70	15.85	12.71	23.47	8.17
Total dissolved solids, field (TDS)	mg/L	--	--	50	179	126	44	631	57	49	35
Turbidity, field	NTU	--	--	41.6	52.1	52.7	44.2	95.7	0.4	0.0	2.1
General Chemistry											
Alkalinity, bicarbonate	mg/L	--	--	38.6	88.9	89.5	61.8	65.0	38.5	43.2	40.1
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	38.6	88.9	89.5	61.8	65.0	38.5	43.2	40.1
Chloride (dissolved)	mg/L	250	1500	3.72	29.5	15.4	3.80	3.58	0.83	0.85	0.87
Conductivity	uS/cm	--	--	89.8	277	224	137	142	84.6	92.2	87.4
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.020)	0.023	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	37.6	106	95.0	56.8	62.0	39.2	42.4	38.8
Sulfate (dissolved)	mg/L	500	[b]	1.76	2.77	4.52	2.38	1.23	2.37	2.24	2.47
Total dissolved solids (TDS)	mg/L	--	--	63	200	165	98	95	62	75	66
Nutrients											
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	0.0137	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.0792	0.234	0.166	0.190	0.0536	0.0480	0.0554	0.0447
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	0.0016	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.0792	0.234	0.168	0.190	0.0536	0.0480	0.0554	0.0447
Dissolved Metals											
Aluminum (dissolved)	ug/L	9500	--	4.2	3.5	3.8	13.6	1	3.4	4	2.5
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	ND (0.1)	ND (0.1)	ND (0.1)	0.14	ND (0.1)	0.68	0.36	0.38
Barium (dissolved)	ug/L	1000	10000	0.5	0.95	2.44	0.44	0.98	0.53	0.58	0.36
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	5	[b]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.0102	0.007	0.0071	0.0128
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	11900	32600	29600	17600	19900	12600	14000	13100
Chromium (dissolved)	ug/L	50	10	ND (0.5)	0.8	0.9	0.57	ND (0.5)	0.62	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	ND (0.2)	ND (0.2)	0.66	0.27	0.41	3.05	1.62	1.8
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	16	ND (10)	18	16	34
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.201	0.141	0.305
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	1910	5940	5130	3110	3000	1870	1800	1490
Manganese (dissolved)	ug/L	1500	--	1.02	0.76	0.92	0.82	0.3	ND (0.1)	0.34	0.22
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	ND (0.05)	0.096	0.096	0.119	0.149	0.144	0.117	0.293
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	249	402	384	269	300	247	226	220
Rubidium (dissolved)	ug/L	--	--	ND (0.2)	0.22	0.21	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Selenium (dissolved)	ug/L	10	20	ND (0.05)	0.304	0.119	0.098	0.333	0.165	0.088	0.129
Silicon (dissolved)	ug/L	--	--	5840	5270	5020	4670	5460	5600	3390	4580
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	2270	3300	3230	2440	2210	1330	1020	1170
Strontium (dissolved)	ug/L	2500	--	32	81.1	76.2	42.9	35.8	21.1	22	19.3
Sulphur (dissolved)	ug/L	--	--	ND (500)	770	1380	ND (500)	ND (500)	ND (500)	640	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	0.14	0.19	0.15	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	0.54	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.044	0.162	0.194	0.103	ND (0.01)	0.013	0.012	0.013
Vanadium (dissolved)	ug/L	20	--	2.42	2.47	2.55	3.42	1.26	4.81	2.41	2.68
Zinc (dissolved)	ug/L	3000	[b]	3.5	3.3	2.4	2.3	ND (1)	22.7	12.3	25.4
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
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Sample Location:				EBA04-6				EBA04-7			
Sample ID:		BC CSR Schedule 3.2		WG-11209296-210222-MJ-10	WG-11209296-240522-NT-12	WG-11209296-230822-NT-21	WG-11209296-221122-NT-15	WG-11209296-210222-MJ-09	WG-11209296-240522-NT-11	WG-11209296-230822-NT-20	WG-11209296-221122-NT-14
Sample Date:				02/21/2022	05/24/2022	08/23/2022	11/22/2022	02/21/2022	05/24/2022	08/23/2022	11/22/2022
Parameters	Units	DW a	FAW b								
Field Parameters											
Conductivity, field	uS/cm	--	--	496	649	550	390	770	799	851	623
Oxidation reduction potential (ORP), field	millivolts	--	--	325	191	291	197	211	260	318	176
pH, field	s.u.	--	--	7.40	7.29	7.39	7.66	7.17	7.00	7.13	7.43
Temperature, field	Deg C	--	--	9.05	11.09	13.90	10.64	8.38	11.10	14.31	9.55
Total dissolved solids, field (TDS)	mg/L	--	--	323	416	352	253	495	511	544	399
Turbidity, field	NTU	--	--	1.7	0.8	0.8	2.2	1.5	0.9	0.4	0.7
General Chemistry											
Alkalinity, bicarbonate	mg/L	--	--	308	329	335	252	449	386	386	439
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	308	329	335	252	449	386	386	439
Chloride (dissolved)	mg/L	250	1500	3.64	6.52	11.3	2.52	24.6	25.9	72.7	45.8
Conductivity	uS/cm	--	--	562	615	649	496	871	775	919	998
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.100)	ND (0.020)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)
Hardness	mg/L	--	--	279	360	346	239	405	410	438	451
Sulfate (dissolved)	mg/L	500	[b]	3.62	6.22	14.2	2.52	14.7	10.0	11.5	12.7
Total dissolved solids (TDS)	mg/L	--	--	349	408	416	295	497	462	604	534
Nutrients											
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	0.0134	0.0098	0.0122	0.0116
Nitrate (as N)	mg/L	10	400	2.12	2.11	2.56	1.57	1.37	0.893	2.48	0.796
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0050)	ND (0.0010)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrite/Nitrate	mg/L	10	400	2.12	2.11	2.56	1.57	1.37	0.893	2.48	0.796
Dissolved Metals											
Aluminum (dissolved)	ug/L	9500	--	1.5	ND (1)	1.4	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	ND (0.1)	0.13	ND (0.1)	ND (0.1)	0.13	0.12	0.12	0.15
Barium (dissolved)	ug/L	1000	10000	6.83	8.47	8.62	5.85	17.1	15.3	15.8	18.2
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	31	41	92	55	299	190	180	205
Cadmium (dissolved)	ug/L	5	[b]	0.0055	0.0105	0.0095	0.0062	0.0551	0.049	0.0515	0.0619
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	83700	109000	106000	72600	122000	120000	131000	135000
Chromium (dissolved)	ug/L	50	10	1.02	0.85	ND (0.5)	1.21	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.56	0.34	0.31	0.52
Copper (dissolved)	ug/L	1500	[b]	ND (0.2)	0.51	0.81	0.2	4.4	2.02	1.65	3.75
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	1.2	1.1	1.2	1.1
Magnesium (dissolved)	ug/L	--	--	17000	21300	19700	14000	24400	26700	26900	27700
Manganese (dissolved)	ug/L	1500	--	ND (0.1)	0.18	0.22	ND (0.1)	318	298	390	450
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.1	0.097	0.095	0.1
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.85	1.11	1.02	1.92
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	1300	1350	1400	1220	2170	2070	2180	2130
Rubidium (dissolved)	ug/L	--	--	0.48	0.55	0.54	0.5	1.06	1.03	1.14	1.3
Selenium (dissolved)	ug/L	10	20	0.059	ND (0.05)	ND (0.05)	0.06	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Silicon (dissolved)	ug/L	--	--	11600	12300	13100	11800	12700	13100	14000	13500
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	6460	6970	7100	6190	23700	22500	22600	23700
Strontium (dissolved)	ug/L	2500	--	189	232	227	152	321	307	334	337
Sulphur (dissolved)	ug/L	--	--	1120	2190	5440	550	5020	3860	4740	4170
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.244	0.288	0.314	0.188	0.913	0.893	0.758	0.736
Vanadium (dissolved)	ug/L	20	--	1.69	1.73	1.6	1.6	1.71	1.74	1.63	1.61
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
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Sample Location:				EBA11-1					EBA11-3			
Sample ID:		BC CSR		WG-11209296-210222-MJ-07	WG-11209296-230522-NT-09	WG-11209296-230522-NT-10	WG-11209296-220822-NT-04	WG-11209296-221122-NT-09	WG-11209296-210222-MJ-03	WG-11209296-230522-NT-07	WG-11209296-230822-NT-19	WG-11209296-221122-NT-20
Sample Date:		Schedule 3.2		02/21/2022	05/23/2022	05/23/2022	08/22/2022	11/22/2022	02/21/2022	05/23/2022	08/23/2022	11/22/2022
		DW	FAW			Duplicate						
Parameters	Units	a	b									
Field Parameters												
Conductivity, field	uS/cm	--	--	1110	120	120	1080	753	87	164	93	98
Oxidation reduction potential (ORP), field	millivolts	--	--	210	226	226	278	192	-208	154	301	189
pH, field	s.u.	--	--	7.54	7.38	7.38	7.54	7.60	7.61	7.82	8.30	8.20
Temperature, field	Deg C	--	--	6.88	10.19	10.19	12.80	9.02	9.57	11.00	12.57	10.32
Total dissolved solids, field (TDS)	mg/L	--	--	708	779	779	694	482	56	107	61	64
Turbidity, field	NTU	--	--	3.3	1.7	1.7	1.0	2.4	1.9	3.2	8.5	7.1
General Chemistry												
Alkalinity, bicarbonate	mg/L	--	--	280	208	206	207	188	45.9	55.4	45.4	54.4
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	280	208	206	207	188	45.9	55.4	45.4	54.4
Chloride (dissolved)	mg/L	250	1500	198	202	204	243	137	1.95	11.8	1.76	2.93
Conductivity	uS/cm	--	--	1200	1150	1140	1340	963	101	159	99.5	119
Fluoride	mg/L	1.5	[b]	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	489	492	480	512	346	43.1	70.5	44.8	54.8
Sulfate (dissolved)	mg/L	500	[b]	31.4	25.4	25.7	25.7	38.2	2.66	2.66	2.37	2.23
Total dissolved solids (TDS)	mg/L	--	--	830	852	887	1060	586	66	100	83	81
Nutrients												
Ammonia-N	mg/L	--	[a]	0.0113	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	14.2[e]	9.16	9.18	12.6[e]	11.6[e]	0.0495	0.143 J	0.0633	0.0325
Nitrite (as N)	mg/L	1	[c]	0.174	0.0538	0.0537	0.0195	0.0396	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	14.4[e]	9.21	9.23	12.6[e]	11.6[e]	0.0495	0.143 J	0.0633	0.0325
Dissolved Metals												
Aluminum (dissolved)	ug/L	9500	--	5.4	ND (1)	2.7	ND (1)	ND (1)	2.9	1.4	2	2.1
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.25	0.23	0.2	0.16	0.16	0.24	0.18	0.24	0.2
Barium (dissolved)	ug/L	1000	10000	16.3	14.4	14.3	17.3	12.3	0.44	0.78	0.37	0.46
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	130	106	105	128	116	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	5	[b]	0.0646	0.053	0.0503	0.0483	0.0555	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	146000	145000	141000	152000	104000	13900	22600	14600	17700
Chromium (dissolved)	ug/L	50	10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.7	ND (0.5)	0.58
Cobalt (dissolved)	ug/L	20 (i)	40	1.17	1.03	1.05	0.72	0.77	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	3.74	3.68	3.74	3.84	3.58	0.31	ND (0.2)	0.23	ND (0.2)
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	30300	31600	31200	32200	21100	2040	3420	2020	2580
Manganese (dissolved)	ug/L	1500	--	1470	1080	1060	449	532	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.13	0.194	0.11	0.087	0.093	0.175	0.119	0.171	0.141
Nickel (dissolved)	ug/L	80	[b]	1.24	1.26	1.29	1.04	1.28	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	1620	1530	1530	1860	1500	275	338	274	298
Rubidium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Selenium (dissolved)	ug/L	10	20	0.117	0.189	0.173	0.112	0.08	0.084	0.334	0.138	0.144
Silicon (dissolved)	ug/L	--	--	9110	9530	9460	9270	9280	4220	4640	4600	4400
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	38000	34200	34300	40800	40700	2410	2800	2200	2220
Strontium (dissolved)	ug/L	2500	--	375	360	355	385	268	26.7	40.3	26.5	31.5
Sulphur (dissolved)	ug/L	--	--	10100	9310	9270	10900	12300	610	780	810	550
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	1.05	1.05	1.06	0.778	0.739	0.025	0.048	0.026	0.04
Vanadium (dissolved)	ug/L	20	--	3.76	3.54	3.46	2.96	3.22	4.1	3.58	3.97	3.96
Zinc (dissolved)	ug/L	3000	[b]	1.3	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				EBA11-4					HBT94-1		
Sample ID:		BC CSR		WG-11209296-210222-MJ-04	WG-11209296-210222-MJ-05	WG-11209296-230522-NT-06	WG-11209296-230822-NT-17	WG-11209296-221122-NT-19	WG-11209296-240522-NT-22	WG-11209296-230822-NT-23	WG-11209296-221122-NT-22
Sample Date:		Schedule 3.2		02/21/2022	02/21/2022	05/23/2022	08/23/2022	11/22/2022	05/24/2022	08/23/2022	11/22/2022
		DW	FAW		Duplicate						
Parameters	Units	a	b								
Field Parameters											
Conductivity, field	uS/cm	--	--	106	106	120	106	114	541	1150	790
Oxidation reduction potential (ORP), field	millivolts	--	--	-291	-291	145	291	176	151	83	197
pH, field	s.u.	--	--	7.89	7.89	7.98	8.36	8.39	7.29	7.91	7.18
Temperature, field	Deg C	--	--	8.88	8.88	11.29	12.55	10.26	11.75	14.52	9.15
Total dissolved solids, field (TDS)	mg/L	--	--	69	69	78	69	74	346	735	506
Turbidity, field	NTU	--	--	25.0	25.0	22.9	19.8	30.3	38.7	26	10.4
General Chemistry											
Alkalinity, bicarbonate	mg/L	--	--	47.3	47.7	48.2	47.2	58.4	218	723	378
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	-	ND (1.0)	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	47.3	47.7	48.2	47.2	58.4	218	723	378
Chloride (dissolved)	mg/L	250	1500	7.98	7.97	4.93	4.08	3.40	34.6	91.3	68.0
Conductivity	uS/cm	--	--	124	124	119	112	137	550	1500	919
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.020)	0.020	ND (0.020)	0.024	ND (0.200)	ND (0.100)
Hardness	mg/L	--	--	50.8	50.5	50.1	48.2	61.8	184	646	336
Sulfate (dissolved)	mg/L	500	[b]	2.46	2.45	2.05	1.95	4.76	6.76	5.46	5.13
Total dissolved solids (TDS)	mg/L	--	--	85	76	81	86	90	284	830	508
Nutrients											
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	4.84	12.6[b]	7.83
Nitrate (as N)	mg/L	10	400	0.282	0.280	0.255	0.209	0.569	0.685	0.231	0.842
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	0.147	ND (0.0100)	0.0300
Nitrite/Nitrate	mg/L	10	400	0.282	0.280	0.255	0.209	0.569	0.832	0.231	0.872
Dissolved Metals											
Aluminum (dissolved)	ug/L	9500	--	7.5	7.3	4	4.2	3.1	1.4	3.7	3.1
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.24	0.22	0.25
Arsenic (dissolved)	ug/L	10	50	1.72	1.66	2.18	2.24	1.63	0.19	1.13	0.19
Barium (dissolved)	ug/L	1000	10000	1.49	1.53	1.43	1.18	1.78	8.32	54.5	19.7
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.1)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	190	1280	380
Cadmium (dissolved)	ug/L	5	[b]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.0929	0.0413	0.052
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.144	0.203	0.127
Calcium (dissolved)	ug/L	--	--	15800	15700	15600	15100	19000	63400	218000	112000
Chromium (dissolved)	ug/L	50	10	2.04	1.97	1.76	1.52	0.76	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.16	1.83	0.56
Copper (dissolved)	ug/L	1500	[b]	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	4.12	1.99	4
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	1830	73
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.1)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	1.4	2	1.3
Magnesium (dissolved)	ug/L	--	--	2760	2750	2710	2550	3500	6210	24700	13600
Manganese (dissolved)	ug/L	1500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	1240	7500[a]	3490[a]
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.106	0.1	0.106	0.1	0.089	0.7	0.684	0.511
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.13	6.75	2.67
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	53	55	ND (50)	ND (50)	ND (100)	ND (50)
Potassium (dissolved)	ug/L	--	--	1040	1020	818	728	1200	6410	10600	7950
Rubidium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	2.19	3	1.87
Selenium (dissolved)	ug/L	10	20	0.314 J	0.234 J	0.424	0.291	0.134	ND (0.05)	ND (0.1)	ND (0.05)
Silicon (dissolved)	ug/L	--	--	5280	5440	6040	6290	5280	8290	12000	9380
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.02)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	2860	2820	2660	2660	3170	27000	53700	34700
Strontium (dissolved)	ug/L	2500	--	31.2	30.4	29.1	29.9	35.6	266	942	440
Sulphur (dissolved)	ug/L	--	--	610	660	ND (500)	730	1460	2780	3450	2500
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.4)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.02)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.2)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.19	0.26	0.2
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.6)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.2)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.249	0.241	0.272	0.253	0.385	0.105	0.348	0.168
Vanadium (dissolved)	ug/L	20	--	15.1	14.8	17.4	17.7	14.9	ND (0.5)	1	ND (0.5)
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	3.7	3.1	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.4)	ND (0.2)

Table 4
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Sample Location:				HBT94-2				MW01-16			
Sample ID:		BC CSR Schedule 3.2		WG-11209296-210222-MJ-02	WG-11209296-240522-NT-23	WG-11209296-230822-NT-22	WG-11209296-221122-NT-23	WG-11209296-210222-MJ-01	WG-11209296-230522-NT-01	WG-11209296-220822-NT-01	WG-11209296-211122-NT-01
Sample Date:				02/21/2022	05/24/2022	08/23/2022	11/22/2022	02/21/2022	05/23/2022	08/22/2022	11/21/2022
Parameters	Units	DW a	FAW b								
Field Parameters											
Conductivity, field	uS/cm	--	--	421	630	582	405	92	72	57	91
Oxidation reduction potential (ORP), field	millivolts	--	--	11	-37	85	-40	-24	155	336	196
pH, field	s.u.	--	--	7.59	7.37	8.16	7.67	6.99	7.19	6.76	7.37
Temperature, field	Deg C	--	--	9.63	12.07	14.80	11.29	11.31	11.43	9.98	7.57
Total dissolved solids, field (TDS)	mg/L	--	--	274	403	373	265	60	47	37	59
Turbidity, field	NTU	--	--	10.5	1.5	2.6	3.4	0.9	1.6	6.3	3.2
General Chemistry											
Alkalinity, bicarbonate	mg/L	--	--	208	266	291	194	39.9	30.3	32.7	53.4
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	208	266	291	194	39.9	30.3	32.7	53.4
Chloride (dissolved)	mg/L	250	1500	33.2	31.3	57.0	38.4	7.40	1.56	0.89	0.96
Conductivity	uS/cm	--	--	480	601	692	496	104	69.8	73.1	113
Fluoride	mg/L	1.5	[b]	ND (0.050)	0.025	ND (0.100)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	166	238	270	182	46.6	31.7	31.8	51.3
Sulfate (dissolved)	mg/L	500	[b]	3.32	2.49	1.87	2.27	2.61	2.14	2.24	2.50
Total dissolved solids (TDS)	mg/L	--	--	264	314	387	256	71	54	49	78
Nutrients											
Ammonia-N	mg/L	--	[a]	5.65	6.82	7.17[*]	5.66	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.0067	0.0122	ND (0.0250)	0.0055	0.0363	0.0354	0.0588	0.104
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	0.0264	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.0067	0.0122	0.0264	0.0055	0.0363	0.0354	0.0588	0.104
Dissolved Metals											
Aluminum (dissolved)	ug/L	9500	--	4.6	3.8	3.3	3.6	4.3	2	1.7	ND (1)
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	1.34	1.62	1.77	1.54	ND (0.1)	0.11	ND (0.1)	ND (0.1)
Barium (dissolved)	ug/L	1000	10000	12.3	18	20.2	12.8	1.86	1.46	0.94	1.86
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	117	112	162	162	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	5	[b]	0.0319	0.0467	0.0437	0.0397	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	55400	80800	91400	62200	15300	10300	10200	16800
Chromium (dissolved)	ug/L	50	10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	0.12	0.17	0.18	0.15	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	0.48	0.3	0.45	0.3	ND (0.2)	ND (0.2)	0.23	ND (0.2)
Iron (dissolved)	ug/L	6500	--	228	329	418	258	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	6670	8860	10100	6510	2030	1460	1550	2270
Manganese (dissolved)	ug/L	1500	--	871	1270	1460	966	0.12	ND (0.1)	0.18	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.155	0.145	0.138	0.157	0.135	0.152	0.107	0.069
Nickel (dissolved)	ug/L	80	[b]	0.91	1.17	1.65	1.05	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	3920	5010	5320	4690	192	146	128	160
Rubidium (dissolved)	ug/L	--	--	0.52	0.61	0.61	0.49	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Selenium (dissolved)	ug/L	10	20	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.131	0.401	0.092	0.121
Silicon (dissolved)	ug/L	--	--	7330	8010	9170	7890	3940	3760	3210	3370
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	19300	22300	25100	18300	1230	1030	924	1120
Strontium (dissolved)	ug/L	2500	--	184	254	296	196	25.1	15.8	16.1	24
Sulphur (dissolved)	ug/L	--	--	1090	1180	1360	780	690	510	520	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.087	0.128	0.132	0.076	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Vanadium (dissolved)	ug/L	20	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.41	1.42	1.04	0.9
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
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Sample Location:				MW02-18					MW03-18			
Sample ID:		BC CSR		WG-11209296-220222-MJ-19	WG-11209296-240522-NT-18	WG-11209296-230822-NT-08	WG-11209296-230822-NT-09	WG-11209296-211122-NT-07	WG-11209296-220222-MJ-12	WG-11209296-230522-NT-02	WG-11209296-230822-NT-14	WG-11209296-221122-NT-16
Sample Date:		Schedule 3.2		02/22/2022	05/24/2022	08/23/2022	08/23/2022	11/21/2022	02/22/2022	05/23/2022	08/23/2022	11/22/2022
		DW	FAW				Duplicate					
Parameters	**Units**	**a**	**b**									
Field Parameters												
Conductivity, field	uS/cm	--	--	572	657	732	732	424	137	158	119	245
Oxidation reduction potential (ORP), field	millivolts	--	--	107	61	137	137	102	384	153	221	166
pH, field	s.u.	--	--	7.84	7.02	7.05	7.05	7.53	7.35	7.73	8.76	8.43
Temperature, field	Deg C	--	--	9.11	11.93	15.64	15.64	9.98	8.77	13.05	14.32	11.40
Total dissolved solids, field (TDS)	mg/L	--	--	366	420	468	468	276	89	103	77	159
Turbidity, field	NTU	--	--	0.0	0.8	0.3	0.3	1.2	1.7	0.3	0.4	1.3
General Chemistry												
Alkalinity, bicarbonate	mg/L	--	--	228	254	346	349	262	77.6	72.1	71.7	141
Alkalinity, carbonate	mg/L	--	--	20.6	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	-	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	249	254	346	349	262	77.6	72.1	71.7	141
Chloride (dissolved)	mg/L	250	1500	31.7	53.2	44.8	45.6	47.2	1.58	1.80	2.82	7.24
Conductivity	uS/cm	--	--	563	659	815	818	685	159	154	146	298
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	174	191	252	257	209	76.1	73.4	66.6	151
Sulfate (dissolved)	mg/L	500	[b]	2.35	1.63	1.65	1.70	2.87	2.77	2.56	2.35	2.36
Total dissolved solids (TDS)	mg/L	--	--	287	328	405	404	343	86	102	106	185
Nutrients												
Ammonia-N	mg/L	--	[a]	11.3	11.5	17.3	16.9	13.4[b]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	ND (0.0050)	ND (0.0250)	0.166	0.168	ND (0.0050)	0.144	0.194	0.124	0.221
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	ND (0.0051)	ND (0.0255)	0.166	0.168	ND (0.0051)	0.144	0.194	0.124	0.221
Dissolved Metals												
Aluminum (dissolved)	ug/L	9500	--	1.9	1.3	1.2	1.6	ND (1)	5	4.6	5	3.7
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.21	0.2	0.22	0.22	0.18	0.6	0.56	0.58	0.44
Barium (dissolved)	ug/L	1000	10000	25.3	28.2	41.6	41.5	29.1	1.86	1.92	1.59	3.7
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	229	241	265	260	221	27	19	16	36
Cadmium (dissolved)	ug/L	5	[b]	0.0679	0.0821	0.0966	0.103	0.0867	ND (0.005)	ND (0.005)	ND (0.005)	0.0127
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	51100	57700	74200	76000	63600	26900	26000	23700	53000
Chromium (dissolved)	ug/L	50	10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	1.04	1.04	1.41	1.42	1.09	ND (0.1)	ND (0.1)	ND (0.1)	0.13
Copper (dissolved)	ug/L	1500	[b]	8.27	8.38	8.36	8.46	8.84	0.31	0.25	0.34	1.64
Iron (dissolved)	ug/L	6500	--	22	31	35	35	42	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	11200	11500	16300	16400	12200	2180	2070	1800	4500
Manganese (dissolved)	ug/L	1500	--	1800[a]	2000[a]	2670[a]	2660[a]	2060[a]	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	0.0054	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.816	0.74	0.627	0.637	0.66	0.152	0.166	0.152	0.08
Nickel (dissolved)	ug/L	80	[b]	1.46	1.09	1.47	1.48	1.85	ND (0.5)	ND (0.5)	ND (0.5)	0.52
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	8930	9090	11100	11300	9560	536	517	490	778
Rubidium (dissolved)	ug/L	--	--	0.52	0.5	0.6	0.62	0.5	ND (0.2)	ND (0.2)	ND (0.2)	0.24
Selenium (dissolved)	ug/L	10	20	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.164	0.452	0.143	0.099
Silicon (dissolved)	ug/L	--	--	14200	13200	14300	14300	13100	4560	4450	4390	4550
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	32600	28800	31000	31000	25400	2310	2250	2240	3320
Strontium (dissolved)	ug/L	2500	--	240	258	360	359	272	43.8	42.8	40.2	86.2
Sulphur (dissolved)	ug/L	--	--	850	1000	850	890	720	750	560	700	590
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.297	0.281	0.439	0.434	0.338	0.056	0.05	0.042	0.102
Vanadium (dissolved)	ug/L	20	--	1.85	1.68	1.73	1.73	1.62	2.87	2.77	2.81	2.37
Zinc (dissolved)	ug/L	3000	[b]	1.2	ND (1)	ND (1)	1.5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
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Campbell River, British Columbia

Sample Location:				MW04-19				MW06-21				
Sample ID:		BC CSR		WG-11209296-220222-MJ-11	WG-11209296-240522-NT-21	WG-11209296-230822-NT-07	WG-11209296-211122-NT-08	WG-11209296-220222-MJ-17	WG-11209296-240522-NT-16	WG-11209296-230822-NT-10	WG-11209296-211122-NT-04	WG-11209296-211122-NT-05
Sample Date:		Schedule 3.2		02/22/2022	05/24/2022	08/23/2022	11/21/2022	02/22/2022	05/24/2022	08/23/2022	11/21/2022	11/21/2022 Duplicate
Parameters	Units	DW a	FAW b									
Field Parameters												
Conductivity, field	uS/cm	--	--	125	166	120	79	198	205	163	129	129
Oxidation reduction potential (ORP), field	millivolts	--	--	317	116	302	100	233	163	277	160	160
pH, field	s.u.	--	--	8.28	8.36	7.81	9.24	8.59	7.87	7.86	8.45	8.45
Temperature, field	Deg C	--	--	8.57	11.45	12.47	8.48	8.30	11.18	12.36	9.39	9.39
Total dissolved solids, field (TDS)	mg/L	--	--	81	108	78	51	129	133	106	84	84
Turbidity, field	NTU	--	--	302	1000	244	512	13.2	16.0	50.5	24.1	24.1
General Chemistry												
Alkalinity, bicarbonate	mg/L	--	--	69.8	72.6	66.8	56.4	112	102	99.3	99.0	96.5
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	-	ND (1.0)	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	ND (1.0)	-	-
Alkalinity, total (as CaCO3)	mg/L	--	--	69.8	72.6	66.8	56.4	112	102	99.3	99.0	96.5
Chloride (dissolved)	mg/L	250	1500	3.58	4.19	3.95	3.47	2.41	2.45	2.34	2.35	2.34
Conductivity	uS/cm	--	--	151	170	152	131	216	209	206	211	212
Fluoride	mg/L	1.5	[b]	ND (0.020)	0.022	ND (0.020)	0.021	0.024	0.027	0.023	0.025	0.025
Hardness	mg/L	--	--	67.7	72.7	70.4	52.3	107	96.1	95.7	96.5	98.4
Sulfate (dissolved)	mg/L	500	[b]	3.94	4.13	3.97	3.68	2.35	2.11	2.12	2.26	2.25
Total dissolved solids (TDS)	mg/L	--	--	92	101	113	98	120	110	141	130	131
Nutrients												
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	0.0072	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.196	0.201	0.195	0.208	0.635	0.648	0.581	0.555	0.556
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.196	0.201	0.195	0.208	0.635	0.648	0.581	0.555	0.556
Dissolved Metals												
Aluminum (dissolved)	ug/L	9500	--	7.8	12.9	6.8	18.2	7.3	2.7	12.5	2	1.9
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.36	0.23	0.25	0.32	0.37	0.35	0.32	0.27	0.3
Barium (dissolved)	ug/L	1000	10000	4.47	4.76	3.93	2.92	12	10.1	10.3	9.07	9.16
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	5	[b]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	18500	19700	18800	14500	31000	27900	27200	27900	28500
Chromium (dissolved)	ug/L	50	10	6.29	6.9	7.41	5.73	2.45	2.43	2.5	2.08	2.06
Cobalt (dissolved)	ug/L	20 (i)	40	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	ND (0.2)	ND (0.2)	ND (0.2)	0.3	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Iron (dissolved)	ug/L	6500	--	ND (10)	ND (10)	ND (10)	11	ND (10)	ND (10)	14	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	5220	5720	5700	3920	7240	6420	6750	6520	6610
Manganese (dissolved)	ug/L	1500	--	ND (0.1)	ND (0.1)	ND (0.1)	0.39	0.26	ND (0.1)	0.49	ND (0.1)	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.148	0.17	0.112	0.142	0.224	0.162	0.164	0.151	0.146
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	796	786	738	657	625	583	583	536	526
Rubidium (dissolved)	ug/L	--	--	0.36	0.31	0.25	0.24	0.72	0.54	0.6	0.54	0.55
Selenium (dissolved)	ug/L	10	20	0.255	0.239	0.313	0.264	0.096	0.126	0.118	0.101 J	0.152 J
Silicon (dissolved)	ug/L	--	--	7910	7250	7560	6940	6820	6390	6570	6180	6120
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	4100	4170	4000	3300	3180	2430	2510	2410	2400
Strontium (dissolved)	ug/L	2500	--	44.8	48.4	44.8	34.1	50.9	47.2	46.2	47.4	46.2
Sulphur (dissolved)	ug/L	--	--	1130	1360	1230	960	540	950	550	ND (500)	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	0.12	ND (0.1)	ND (0.1)	0.19	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	ND (0.3)	ND (0.3)	ND (0.3)	0.59	ND (0.3)	ND (0.3)	0.64	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.14	0.182	0.152	0.088	0.558	0.345	0.32	0.368	0.365
Vanadium (dissolved)	ug/L	20	--	5.17	4.65	5.07	5.26	6.08	5.86	6.06	5.8	5.84
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 4
Groundwater Analytical Results - General Chemistry, Nutrients and Metals
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Sample Location:				MW07-21					MW08-21			
Sample ID:		BC CSR		WG-11209296-220222-MJ-15	WG-11209296-240522-NT-19	WG-11209296-230822-NT-15	WG-11209296-221122-NT-11	WG-11209296-221122-NT-12	WG-11209296-210222-MJ-08	WG-11209296-230522-NT-08	WG-11209296-220822-NT-05	WG-11209296-221122-NT-10
Sample Date:		Schedule 3.2		02/22/2022	05/24/2022	08/23/2022	11/22/2022	11/22/2022	02/21/2022	05/23/2022	08/22/2022	11/22/2022
		DW	FAW					Duplicate				
Parameters	Units	a	b									
Field Parameters												
Conductivity, field	uS/cm	--	--	152	169	151	135	135	626	634	479	289
Oxidation reduction potential (ORP), field	millivolts	--	--	242	101	255	151	151	300	170	309	177
pH, field	s.u.	--	--	8.75	8.18	8.13	8.94	8.94	7.59	7.42	7.66	8.21
Temperature, field	Deg C	--	--	9.72	13.06	13.51	9.43	9.43	8.68	11.32	13.53	8.75
Total dissolved solids, field (TDS)	mg/L	--	--	99	110	98	87	87	400	406	311	188
Turbidity, field	NTU	--	--	15.5	4.7	99.4	3.8	3.8	78.9	55.8	53.5	48.2
General Chemistry												
Alkalinity, bicarbonate	mg/L	--	--	82.6	79.7	87.5	105	104	278	234	220	198
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	ND (1.0)	-	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	-	ND (1.0)	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	--	82.6	79.7	87.5	105	104	278	234	220	198
Chloride (dissolved)	mg/L	250	1500	1.66	2.10	2.86	2.78	2.76	71.3	49.1	29.2	17.9
Conductivity	uS/cm	--	--	167	172	184	213	213	722	601	523	448
Fluoride	mg/L	1.5	[b]	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.100)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	79.2	77.4	90.7	98.1	99.0	339	310	242	210
Sulfate (dissolved)	mg/L	500	[b]	2.79	2.39	2.31	2.64	2.61	8.00	7.28	5.89	5.80
Total dissolved solids (TDS)	mg/L	--	--	100	95	124	148	138	456	415	320	281
Nutrients												
Ammonia-N	mg/L	--	[a]	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Nitrate (as N)	mg/L	10	400	0.160	0.181	0.140	0.188	0.186	0.979	0.733	0.709	0.642
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0050)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	10	400	0.160	0.181	0.140	0.188	0.186	0.979	0.733	0.709	0.642
Dissolved Metals												
Aluminum (dissolved)	ug/L	9500	--	44.2	5.4	10.3	3.4	3.5	3.7	ND (1)	1.9	ND (1)
Antimony (dissolved)	ug/L	6	90	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	10	50	0.36	0.33	0.33	0.28	0.29	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Barium (dissolved)	ug/L	1000	10000	2.5	2.2	2.17	2.11	2.22	12.7	11.2	8.92	7.7
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	14	14	13	21	21	15	14	16	15
Cadmium (dissolved)	ug/L	5	[b]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.0064	0.0057	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	27900	27600	32200	34800	35100	107000	98800	76000	66600
Chromium (dissolved)	ug/L	50	10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.45	1.61	1.6	1.62
Cobalt (dissolved)	ug/L	20 (i)	40	0.13	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	1500	[b]	0.71	0.26	0.59	0.46	0.47	0.27	ND (0.2)	ND (0.2)	ND (0.2)
Iron (dissolved)	ug/L	6500	--	79	ND (10)	12	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Lead (dissolved)	ug/L	10	[b]	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	8	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	1.1	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	2310	2060	2510	2720	2750	17400	15300	12700	10700
Manganese (dissolved)	ug/L	1500	--	5.84	ND (0.1)	0.68	ND (0.1)	ND (0.1)	0.5	0.19	0.12	ND (0.1)
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.156	0.124	0.134	0.097	0.12	0.052	ND (0.05)	ND (0.05)	ND (0.05)
Nickel (dissolved)	ug/L	80	[b]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	497	502	490	473	479	1510	1410	1350	1200
Rubidium (dissolved)	ug/L	--	--	0.22	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.27	0.22	0.25	0.22
Selenium (dissolved)	ug/L	10	20	0.117	0.134	0.173	0.123	0.133	0.195	0.261	0.193	0.15
Silicon (dissolved)	ug/L	--	--	4830	4360	4700	4210	4240	8040	8260	8230	7740
Silver (dissolved)	ug/L	20	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	1920	1730	1830	1890	1980	6380	5760	5330	5330
Strontium (dissolved)	ug/L	2500	--	47.8	47.7	51.7	56.2	55.8	252	220	177	151
Sulphur (dissolved)	ug/L	--	--	820	1010	830	530	ND (500)	2840	2350	2050	1570
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	3.54	ND (0.3)	0.5	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Tungsten (dissolved)	ug/L	3	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.052	0.047	0.058	0.072	0.067	0.434	0.404	0.316	0.289
Vanadium (dissolved)	ug/L	20	--	2.66	2.39	2.26	1.97	1.95	1.62	1.66	1.68	1.68
Zinc (dissolved)	ug/L	3000	[b]	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 5
Groundwater Analytical Results - Volatile Organic Compounds and Petroleum Products
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Sample Location:				AG99-06		AM02-01	EBA04-7		EBA11-1	
Sample ID:		BC CSR		WG-11209296-210222-MJ-06	WG-11209296-230822-NT-18	WG-11209296-230822-NT-06	WG-11209296-210222-MJ-09	WG-11209296-230822-NT-20	WG-11209296-210222-MJ-07	WG-11209296-220822-NT-04
Sample Date:		Schedule 3.2		02/21/2022	08/23/2022	08/23/2022	02/21/2022	08/23/2022	02/21/2022	08/22/2022
Parameters	Units	DW a	FAW b							
Petroleum Products										
VHw6-10	ug/L	15000	15000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
VPHw	ug/L	--	1500	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	ug/L	6	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,1-Trichloroethane	ug/L	8000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,2,2-Tetrachloroethane	ug/L	0.8	--	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
1,1,2-Trichloroethane	ug/L	3	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethane	ug/L	30	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethene	ug/L	14	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichlorobenzene	ug/L	200	7	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloroethane	ug/L	5	1000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloropropane	ug/L	4.5	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,3-Dichlorobenzene	ug/L	--	1500	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,4-Dichlorobenzene	ug/L	5	260	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	ug/L	5	400	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromodichloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromoform	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Carbon tetrachloride	ug/L	2	130	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chlorobenzene	ug/L	80	13	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroethane	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroform (Trichloromethane)	ug/L	100	20	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloromethane (Methyl chloride)	ug/L	--	--	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
cis-1,2-Dichloroethene	ug/L	8	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene	ug/L	--	--	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)
Dibromochloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Ethylbenzene	ug/L	140	2000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
m&p-Xylenes	ug/L	--	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Methyl tert butyl ether (MTBE)	ug/L	95	34000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methylene chloride	ug/L	50	980	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
o-Xylene	ug/L	--	--	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
Styrene	ug/L	800	720	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Tetrachloroethene	ug/L	30	1100	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Toluene	ug/L	60	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
trans-1,2-Dichloroethene	ug/L	80	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
trans-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichloroethene	ug/L	5	200	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichlorofluoromethane (CFC-11)	ug/L	1000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Vinyl chloride	ug/L	2	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Xylenes (total)	ug/L	90	300	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)

Table 5
Groundwater Analytical Results - Volatile Organic Compounds and Petroleum Products
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Sample Location:				EBA11-3		EBA11-4			HBT94-2	
Sample ID:		BC CSR		WG-11209296-210222-MJ-03	WG-11209296-230822-NT-19	WG-11209296-210222-MJ-04	WG-11209296-210222-MJ-05	WG-11209296-230822-NT-17	WG-11209296-210222-MJ-02	WG-11209296-230822-NT-22
Sample Date:		Schedule 3.2		02/21/2022	08/23/2022	02/21/2022	02/21/2022	08/23/2022	02/21/2022	08/23/2022
		DW	FAW				Duplicate			
Parameters	Units	a	b							
Petroleum Products										
VHw6-10	ug/L	15000	15000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
VPHw	ug/L	--	1500	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	ug/L	6	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,1-Trichloroethane	ug/L	8000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,2,2-Tetrachloroethane	ug/L	0.8	--	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
1,1,2-Trichloroethane	ug/L	3	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethane	ug/L	30	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethene	ug/L	14	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichlorobenzene	ug/L	200	7	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloroethane	ug/L	5	1000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloropropane	ug/L	4.5	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,3-Dichlorobenzene	ug/L	--	1500	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,4-Dichlorobenzene	ug/L	5	260	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	ug/L	5	400	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromodichloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromoform	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Carbon tetrachloride	ug/L	2	130	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chlorobenzene	ug/L	80	13	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroethane	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroform (Trichloromethane)	ug/L	100	20	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloromethane (Methyl chloride)	ug/L	--	--	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
cis-1,2-Dichloroethene	ug/L	8	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene	ug/L	--	--	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)
Dibromochloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Ethylbenzene	ug/L	140	2000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
m&p-Xylenes	ug/L	--	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Methyl tert butyl ether (MTBE)	ug/L	95	34000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methylene chloride	ug/L	50	980	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
o-Xylene	ug/L	--	--	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
Styrene	ug/L	800	720	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Tetrachloroethene	ug/L	30	1100	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Toluene	ug/L	60	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
trans-1,2-Dichloroethene	ug/L	80	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
trans-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichloroethene	ug/L	5	200	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichlorofluoromethane (CFC-11)	ug/L	1000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Vinyl chloride	ug/L	2	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Xylenes (total)	ug/L	90	300	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)

Table 5
Groundwater Analytical Results - Volatile Organic Compounds and Petroleum Products
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				MW01-16		MW02-18		
Sample ID:		BC CSR		WG-11209296-210222-MJ-01	WG-11209296-220822-NT-01	WG-11209296-220222-MJ-19	WG-11209296-230822-NT-08	WG-11209296-230822-NT-09
Sample Date:		Schedule 3.2		02/21/2022	08/22/2022	02/22/2022	08/23/2022	08/23/2022
		DW	FAW					Duplicate
Parameters	Units	a	b					
Petroleum Products								
VHw6-10	ug/L	15000	15000	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
VPHw	ug/L	--	1500	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	ug/L	6	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,1-Trichloroethane	ug/L	8000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1,2,2-Tetrachloroethane	ug/L	0.8	--	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
1,1,2-Trichloroethane	ug/L	3	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethane	ug/L	30	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,1-Dichloroethene	ug/L	14	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichlorobenzene	ug/L	200	7	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloroethane	ug/L	5	1000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,2-Dichloropropane	ug/L	4.5	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,3-Dichlorobenzene	ug/L	--	1500	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
1,4-Dichlorobenzene	ug/L	5	260	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	ug/L	5	400	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromodichloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Bromoform	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Carbon tetrachloride	ug/L	2	130	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chlorobenzene	ug/L	80	13	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroethane	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloroform (Trichloromethane)	ug/L	100	20	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Chloromethane (Methyl chloride)	ug/L	--	--	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
cis-1,2-Dichloroethene	ug/L	8	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene	ug/L	--	--	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)
Dibromochloromethane	ug/L	100	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Ethylbenzene	ug/L	140	2000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
m&p-Xylenes	ug/L	--	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Methyl tert butyl ether (MTBE)	ug/L	95	34000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methylene chloride	ug/L	50	980	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
o-Xylene	ug/L	--	--	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)
Styrene	ug/L	800	720	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Tetrachloroethene	ug/L	30	1100	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Toluene	ug/L	60	5	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
trans-1,2-Dichloroethene	ug/L	80	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
trans-1,3-Dichloropropene	ug/L	--	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichloroethene	ug/L	5	200	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Trichlorofluoromethane (CFC-11)	ug/L	1000	--	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Vinyl chloride	ug/L	2	--	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
Xylenes (total)	ug/L	90	300	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)

Table 6a
Surface Water Analytical Results
2022 Annual Operations and Monitoring Report
Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				SW-1				SW03-17		
Sample ID:				WS-11209296-220222-MJ-01	WS-11209296-220222-MJ-02	WS-11209296-230522-NT-01	WS-11209296-221122-NT-01	WS-11209296-230522-NT-02	WS-11209296-230822-NT-01	WS-11209296-221122-NT-02
Sample Date:		BC WQG		02/22/2022	02/22/2022	05/23/2022	11/22/2022	05/23/2022	08/23/2022	11/22/2022
Parameters	Units	DW a	FAW b							
Field Parameters										
Dissolved Oxygen, Field	mg/L	--	>5	9.48	9.48	11.19	-	7.00	6.22	5.89
ORP, Field	millivolts	--	--	476	476	236	137	233	266	146
pH, Field	s.u.	--	6.5-9.0	5.51[b]	5.51[b]	6.10[b]	8.26	6.52	8.37	7.67
Specific Conductance, Field	uS/cm	--	--	29	29	56	53	35	32	18
Temperature, Field	Deg C	15 AO	18 (12 spring/fall) (c) (STM)	3.70	3.70	15.8[a]	5.85	17.92[a]	26.06[ab]	5.25
Total dissolved solids, field (TDS)	mg/L	--	--	19	19	36	35	23	21	11
Turbidity, Field	NTU	(c)	(c)	0.0	0.0	0.0	10.1	1.1	1.4	0.3
General Chemistry										
Alkalinity, bicarbonate	mg/L	--	--	7.7	7.3	9.2	22.5	7.4	10.1	7.0
Alkalinity, carbonate	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	-	-	-	ND (1.0)	-	-	ND (1.0)
Alkalinity, hydroxide (as CaCO3)	mg/L	--	--	ND (1.0)	ND (1.0)	ND (1.0)	-	ND (1.0)	ND (1.0)	-
Alkalinity, total (as CaCO3)	mg/L	--	[e] w	7.7	7.3	9.2	22.5[b]	7.4	10.1[b]	7.0
Chloride (dissolved)	mg/L	**ref only 250 AO	**ref only 150 LTA	3.80	3.80	3.26	4.89	3.17	3.15	3.55
Conductivity	uS/cm	--	--	32.0	31.4	31.7	69.0	27.9	31.7	31.3
Dissolved organic carbon (DOC) (dissolved)	mg/L	--	--	4.88	5.59	6.49	5.82	5.72	6.49	5.67
Fluoride	mg/L	1.5	[b] (STM)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Hardness	mg/L	--	--	9.28	9.60	9.80	24.7	8.52	9.92	8.71
Hardness, calculation	mg/L	--	--	9.72	9.99	9.80	-	8.96	-	-
Sulphate (Dissolved)	mg/L	500 AO	[b]	0.99	1.00	0.61	3.76	0.71	0.52	0.80
Total dissolved solids (TDS)	mg/L	--	--	32	32	33	68	32	32	37
Nutrients										
Ammonia-N	mg/L	--	[d]	0.0136	0.0147	0.0378	0.0127	0.0092	ND (0.0050)	0.0095
Nitrate (as N)	mg/L	10	3.0	0.0355	0.0313	0.0193	0.0125	0.0073	ND (0.0050)	0.0502
Nitrite (as N)	mg/L	1	[c]	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Nitrite/Nitrate	mg/L	--	--	0.0355	0.0313	0.0193	0.0125	0.0073	ND (0.0051)	0.0502
Dissolved Metals										
Aluminum (dissolved)	ug/L	--	[a]	59.2[b]	60[b]	63.4[b]	55[b]	43.6	22.3	41.4
Antimony (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic (dissolved)	ug/L	--	--	0.1	0.11	0.15	0.27	0.12	0.16	0.13
Barium (dissolved)	ug/L	--	--	1.56	1.62	1.75	2.8	1.45	1.31	1.51
Beryllium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron (dissolved)	ug/L	--	--	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium (dissolved)	ug/L	--	[b]	ND (0.005)	ND (0.005)	ND (0.005)	0.0053	ND (0.005)	ND (0.005)	ND (0.005)
Caesium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium (dissolved)	ug/L	--	--	2190	2280	2340	5720	2020	2400	2040
Chromium (dissolved)	ug/L	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	0.19	ND (0.1)	ND (0.1)	ND (0.1)
Copper (dissolved)	ug/L	--	--	0.27	0.27	0.31	0.36	0.26	0.27	0.21
Iron (dissolved)	ug/L	--	350 (STM)	100	102	147	165	80	82	122
Lead (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	0.073	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Lithium (dissolved)	ug/L	--	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium (dissolved)	ug/L	--	--	925	949	960	2520	843	955	878
Manganese (dissolved)	ug/L	--	--	13.8	13.8	27.1	108 J	8.57	2.54	27
Mercury (dissolved)	ug/L	--	--	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Nickel (dissolved)	ug/L	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus (dissolved)	ug/L	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Potassium (dissolved)	ug/L	--	--	124	120	132	786 J	131	137	148
Rubidium (dissolved)	ug/L	--	--	0.22	ND (0.2)	ND (0.2)	0.8 J	ND (0.2)	ND (0.2)	0.24
Selenium (dissolved)	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	0.106	ND (0.05)	ND (0.05)	ND (0.05)
Silicon (dissolved)	ug/L	--	--	3040	3040	2840	6250	2560	2150	2490
Silver (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium (dissolved)	ug/L	--	--	2750	2810	2620	3620	2450	2550	2580
Strontium (dissolved)	ug/L	--	--	9.86	9.84	10.6	20.3	8.92	11	9.37
Sulfur (dissolved)	ug/L	--	--	ND (500)	ND (500)	ND (500)	1050	ND (500)	ND (500)	ND (500)
Tellurium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium (dissolved)	ug/L	--	--	0.88	1.03	1.78	1.92	0.53	0.4	ND (0.6)
Tungsten (dissolved)	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium (dissolved)	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Vanadium (dissolved)	ug/L	--	--	ND (0.5)	ND (0.5)	0.55	2.01	ND (0.5)	ND (0.5)	ND (0.5)
Zinc (dissolved)	ug/L	--	--	ND (1)	1	ND (1)	1.3	ND (1)	1.1	1.2
Zirconium (dissolved)	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 6a
Surface Water Analytical Results
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Campbell River Waste Management Centre
Campbell River, British Columbia

Sample Location:				SW-1				SW03-17		
Sample ID:				WS-11209296-220222-MJ-01	WS-11209296-220222-MJ-02	WS-11209296-230522-NT-01	WS-11209296-221122-NT-01	WS-11209296-230522-NT-02	WS-11209296-230822-NT-01	WS-11209296-221122-NT-02
Sample Date:		BC WQG		02/22/2022	02/22/2022	05/23/2022	11/22/2022	05/23/2022	08/23/2022	11/22/2022
Parameters	Units	DW a	FAW b							
Total Metals										
Aluminum	ug/L	9500	--	70.4	85.1	69.6	83.9	46.5	36.5	43.1
Antimony	ug/L	6	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Arsenic	ug/L	10	5	0.12	0.15	0.15	0.28	ND (0.1)	0.2	0.12
Barium	ug/L	--	1000 w	1.72	1.96	1.7	2.56	1.42	1.52	1.54
Beryllium	ug/L	--	0.13 w	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.02)	ND (0.1)	ND (0.02)	ND (0.02)
Bismuth	ug/L	--	--	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Boron	ug/L	5000	1200	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Cadmium	ug/L	5	--	ND (0.005)	0.0051	0.0057	0.0057	ND (0.005)	ND (0.005)	ND (0.005)
Caesium	ug/L	--	--	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Calcium	ug/L	--	--	2290	2380	2380	5780	2190	2370	2070
Chromium	ug/L	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Cobalt	ug/L	--	4	ND (0.1)	ND (0.1)	0.11	0.13	ND (0.1)	ND (0.1)	ND (0.1)
Copper	ug/L	1000 AO	[b]	ND (0.5)	0.62	0.62	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Iron	ug/L	300 AO	1000 (STM)	126	143	177	163	98	110	147
Lead	ug/L	5	[b]	0.059 J	0.198 J	0.114	ND (0.05)	ND (0.05)	0.051	ND (0.05)
Lithium	ug/L	--	--	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Magnesium	ug/L	--	--	972	984	937	2410	848	986	894
Manganese	ug/L	20 AO	[b]	15.6	16.5	32.2[a]	55 J[a]	7	3.99	26.7[a]
Mercury	ug/L	1	[f]	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Molybdenum	ug/L	88	7600	ND (0.05)	ND (0.05)	ND (0.05)	0.084	ND (0.05)	ND (0.05)	ND (0.05)
Nickel	ug/L	80	[b] w	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Phosphorus	ug/L	10 AO for lakes	5	ND (50)[ab]	ND (50)[ab]	ND (50)[ab]	ND (50)[ab]	ND (50)[ab]	ND (50)[ab]	ND (50)[ab]
Potassium	ug/L	--	--	122	136	148	621 J	155	154	128
Rubidium	ug/L	--	--	0.26	ND (0.2)	0.21	0.55 J	0.23	0.22	0.2
Selenium	ug/L	10	2	ND (0.05)	0.061	ND (0.05)	0.103	ND (0.05)	ND (0.05)	ND (0.05)
Silicon	ug/L	--	--	3280	3280	2860	5620	2590	2150	2320
Silver	ug/L	--	[b]	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium	ug/L	--	--	2960	2900	2560	3490	2390	2680	2620
Strontium	ug/L	7000	--	10.1	10.6	10.2	21.1	9.19	10.9	9.73
Sulphur	ug/L	--	--	ND (500)	ND (500)	ND (500)	850	ND (500)	ND (500)	ND (500)
Tellurium	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Thallium	ug/L	--	0.8 w SS	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Thorium	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Tin	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Titanium	ug/L	--	--	1.7 J	2.69 J	1.71	7.22	0.75	1.26	0.57
Tungsten	ug/L	--	--	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium	ug/L	20	8.5 w	ND (0.01)	0.012	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Vanadium	ug/L	--	--	0.54	0.6	0.7	2.4	ND (0.5)	ND (0.5)	ND (0.5)
Zinc	ug/L	3000 MAC	[b]	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)
Zirconium	ug/L	--	--	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)

Table 6b
Surface Water Analytical Results
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Campbell River, British Columbia

Sample Location:				CAM_SWM Pond
Sample ID:		BC CSR		WS-11209296-221122-NT-03
Sample Date:		Schedule 3.2		11/22/2022
		DW	FAW	
Parameters	Units	a	b	
Field Parameters				
ORP, Field	millivolts	--	--	185
pH, Field	s.u.	--	--	8.05
Specific Conductance, Field	uS/cm	--	--	918
Temperature, Field	Deg C	--	--	7.58
Total dissolved solids, field (TDS)	mg/L	--	--	587
Turbidity, Field	NTU	--	--	23.4
General Chemistry				
Alkalinity, bicarbonate	mg/L	--	--	43.7
Alkalinity, carbonate	mg/L	--	--	ND (1.0)
Alkalinity, hydroxide	mg/L	--	--	ND (1.0)
Alkalinity, total (as CaCO3)	mg/L	--	--	43.7
Chloride (dissolved)	mg/L	250	1500	181
Conductivity	uS/cm	--	--	1160
Dissolved organic carbon (DOC) (dissolved)	mg/L	--	--	8.23
Fluoride	mg/L	1.5	[b]	ND (0.100)
Hardness	mg/L	--	--	203
Sulphate (Dissolved)	mg/L	500	[b]	47.2
Total dissolved solids (TDS)	mg/L	--	--	746
Nutrients				
Ammonia-N	mg/L	--	[a]	0.0749
Nitrate (as N)	mg/L	10	400	**48.7**[a]
Nitrite (as N)	mg/L	1	[c]	0.325
Nitrite/Nitrate	mg/L	10	400	**49.0**[a]
Dissolved Metals				
Aluminum (dissolved)	ug/L	9500	--	46.7
Antimony (dissolved)	ug/L	6	90	0.35
Arsenic (dissolved)	ug/L	10	50	0.2
Barium (dissolved)	ug/L	1000	10000	23.9
Beryllium (dissolved)	ug/L	8	1.5	ND (0.1)
Bismuth (dissolved)	ug/L	--	--	ND (0.05)
Boron (dissolved)	ug/L	5000	12000	30
Cadmium (dissolved)	ug/L	5	[b]	0.047
Caesium (dissolved)	ug/L	--	--	ND (0.01)
Calcium (dissolved)	ug/L	--	--	60700
Chromium (dissolved)	ug/L	50	10	ND (0.5)
Cobalt (dissolved)	ug/L	20 (i)	40	0.13
Copper (dissolved)	ug/L	1500	[b]	6.42
Iron (dissolved)	ug/L	6500	--	43
Lead (dissolved)	ug/L	10	[b]	0.111
Lithium (dissolved)	ug/L	8	--	ND (1)
Magnesium (dissolved)	ug/L	--	--	12600
Manganese (dissolved)	ug/L	1500	--	10.1
Mercury (dissolved)	ug/L	1	0.25	ND (0.005)
Molybdenum (dissolved)	ug/L	250	10000	0.785
Nickel (dissolved)	ug/L	80	[b]	0.67
Phosphorus (dissolved)	ug/L	--	--	ND (50)
Potassium (dissolved)	ug/L	--	--	3440
Rubidium (dissolved)	ug/L	--	--	2.23
Selenium (dissolved)	ug/L	10	20	0.101
Silicon (dissolved)	ug/L	--	--	5580
Silver (dissolved)	ug/L	20	[b]	ND (0.01)
Sodium (dissolved)	ug/L	200000	--	127000
Strontium (dissolved)	ug/L	2500	--	250
Sulfur (dissolved)	ug/L	--	--	16400
Tellurium (dissolved)	ug/L	--	--	ND (0.2)
Thallium (dissolved)	ug/L	--	3	ND (0.01)
Thorium (dissolved)	ug/L	--	--	ND (0.1)
Tin (dissolved)	ug/L	2500	--	ND (0.1)
Titanium (dissolved)	ug/L	--	1000	3.13
Tungsten (dissolved)	ug/L	3	--	ND (0.1)
Uranium (dissolved)	ug/L	20	85	0.016
Vanadium (dissolved)	ug/L	20	--	0.72
Zinc (dissolved)	ug/L	3000	[b]	11.1
Zirconium (dissolved)	ug/L	--	--	ND (0.2)

Table 6b
Surface Water Analytical Results
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Campbell River, British Columbia

Sample Location:				CAM_SWM Pond
Sample ID:		BC CSR		WS-11209296-221122-NT-03
Sample Date:		Schedule 3.2		11/22/2022
		DW	FAW	
Parameters	Units	a	b	
Total Metals				
Aluminum	ug/L	9500	--	537
Antimony	ug/L	6	90	0.37
Arsenic	ug/L	10	50	0.33
Barium	ug/L	1000	10000	25.7
Beryllium	ug/L	8	1.5	ND (0.02)
Bismuth	ug/L	--	--	ND (0.05)
Boron	ug/L	5000	12000	31
Cadmium	ug/L	5	[b]	0.0434
Caesium	ug/L	--	--	0.019
Calcium	ug/L	--	--	63500
Chromium	ug/L	50	10	1.06
Cobalt	ug/L	20 (i)	40	0.38
Copper	ug/L	1500	[b]	9.3
Iron	ug/L	6500	--	560
Lead	ug/L	10	[b]	0.915
Lithium	ug/L	8	--	ND (1)
Magnesium	ug/L	--	--	13300
Manganese	ug/L	1500	--	20.1
Mercury	ug/L	1	0.25	0.0098
Molybdenum	ug/L	250	10000	0.777
Nickel	ug/L	80	[b]	1.07
Phosphorus	ug/L	--	--	75
Potassium	ug/L	--	--	3360
Rubidium	ug/L	--	--	2.44
Selenium	ug/L	10	20	0.093
Silicon	ug/L	--	--	5870
Silver	ug/L	20	[b]	0.022
Sodium	ug/L	200000	--	132000
Strontium	ug/L	2500	--	256
Sulphur	ug/L	--	--	16500
Tellurium	ug/L	--	--	ND (0.2)
Thallium	ug/L	--	3	ND (0.01)
Thorium	ug/L	--	--	ND (0.1)
Tin	ug/L	2500	--	ND (0.1)
Titanium	ug/L	--	1000	39.3
Tungsten	ug/L	3	--	ND (0.1)
Uranium	ug/L	20	85	0.025
Vanadium	ug/L	20	--	2.34
Zinc	ug/L	3000	[b]	18.2
Zirconium	ug/L	--	--	0.36

Analytical Results Tables Notes
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BC ENV	British Columbia Ministry of Environment and Climate Change Strategy
CSR	ENV British Columbia Contaminated Sites Regulation (CSR) Schedule 3.2 Generic Numerical Water Standards (2021)
WQG	ENV British Columbia Approved (March 2021), Working (June 2021) and Source Drinking (December 2020) Water Quality Guidelines (WQG). Most stringent guideline is presented unless otherwise indicated.
FAW	Guideline/standard for the protection of freshwater aquatic life
DW	Guideline/standard for the protection of drinking water
IW	Guideline/standard for the protection of irrigation water. Applies to all soil types.
LW	Guideline/standard for the protection of livestock water
STM	Short term maximum WQG FAW (generally less stringent than LTA guidelines)
LTA	Long term average WQG FAW (generally most stringent guideline). WQGs presented are LTA unless otherwise specified.
a	WQG DW
b	WQG FAW
c	CSR DW
d	CSR FAW
w	Working WQG. Provides benchmarks for those substances that have not yet been fully assessed and endorsed by the ENV.
Interim	Interim WQG developed when insufficient data available to meet the minimum requirement of a full guideline.
AO	Aesthetic objective. Parameters may impair the taste, smell or colour of water or interfere with the supply of good quality water. Parameters do not cause adverse health effects.
ND	Not detected at the associated reporting limit.
J	Estimated concentration.
R	Rejected result
[a]	Limit varies with pH.
[b]	Limit varies with Hardness.
[c]	Limit varies with Chloride (mg/L).
[d]	Limit varies with pH and Temperature.
[e]	Limit varies with Dissolved Calcium.
[f]	Limit varies with Methyl Mercury.
[h]	Standard varies with pH, temperature and substance isomer.
calca	EXP(1.6-3.327*pH+0.402*pH^2) mg/L
calcb	EXP(0.736*LN(Hardness)-4.943) ug/L
calcc	0.04*Hardness ug/L
calcd	3.31+(Exp(1.273*LOG(Hardness)-4.704)) ug/L
calce	0.0044*Hardness+0.605 mg/L
calch	Exp(0.76*LN(Hardness)+1.06) ug/L
calcf	7.5+(0.75*(Hardness-90)) ug/L
[i]	B.C. Ministry of Environment and Climate Change, 2021. Protocol 9 for Contaminated Sites Version 2.
[j]	Limit varies with dissolved calcium
[l]	Limit varies with crop.
{ii}	Standard varies with pH, temperature and substance isomer. Consult a director for further advice.
	Exceeds indicated standard or guideline
Blue text	Laboratory detection limit is greater than indicated standard or guideline
(c)	Background dependant. Comparison to background not complete or background location has not been established.
SS	Site-specific objective for the lower Columbia River, BC
Dissolved Oxygen, field	WQG specific to buried embryo/alevin life stages of aquatic life (most conservative).
Temperature, field (stream)	WQG specific to streams with unknown fish distributions.
Turbidity, field	WQG applies to water during clear flows or clear water
Cadmium, dissolved	WQG LTA applies to water hardnesses between 3.4 and 285 mg/L CaCO3.
Copper, total	WQG LTA applies to water hardnesses between 50 and 250 mg/L CaCO3.
Lead, total	WQG LTA and STM apply to water hardnesses between 8 and 360 mg/L CaCO3.
Manganese, total	WQG LTA applies to water hardnesses between 37 and 450 mg/L CaCO3.
Phosphorous, total (lakes)	WQG applies to total phosphorous in lakes where salmonoids are predominant fish species and during the spring overturn (if residence time of the epilimnetic water exceeds 6 months) or the mean phosphorous epilimnetic growing season concentration (if time of the epilimnetic water is less than 6 months) residence
Selenium, total	Alert concentration = 1 ug/L.
Zinc, total	WQG LTA applies to water hardnesses between 90 and 330 mg/L CaCO3.
**	Chloride guideline only applies to total Chloride. Guideline has been included for reference only.