TECHNICAL MEMORANDUM

To:	**Ashleigh Crompton, Mike Champion, Jackie Boruch, Ryan Schucroft, Jamie Maxwell (Woodfibre LNG)**	**Date:**	**24 May 2024**
From:	**Holly Pelletier and Patrick Mueller (Lorax)**	**Project #:**	**A633-7**
Subject:	**PE-111578 Weekly Discharge and Compliance Report #14 for May 12 – May 18**		

Waste Discharge Authorization Effluent Permit PE-111578 was issued by the British Columbia Energy Regulator (BCER) to Woodfibre LNG on February 9, 2024. The permit specifies monitoring and reporting requirements that are required to be met by Woodfibre LNG during construction of the LNG Export Facility. Reporting is required on a weekly basis.

Discharge and compliance monitoring is conducted by on-site Environmental Monitors (Roe Environmental) that are sub-contracted to the civil works contractor (LB LNG). Analytical samples are submitted by Roe Environmental to ALS Environmental in Burnaby, BC, for testing. Lorax Environmental provides water quality database management and WDA compliance reporting services for Woodfibre LNG.

This technical memorandum (Report #14) was prepared by Lorax Environmental and summarizes monitoring conducted the week of May 12 – May 18 for contact waters directed to a WWTP or a sedimentation pond and presents monitoring data that were available at the time of reporting including results that were pending from prior reporting periods. Figures referenced in the report discussion are included at the end of this report. Report #14 has been prepared to meet the reporting requirements specified in Condition 4.2 of WDA Effluent Permit PE-111578:

> "The Permittee shall summarize the results of the discharge and compliance monitoring program in a report that shall be submitted to the BCER weekly over the term of this permit. Reports must include suitable tabulated data. The table must include any applicable regulatory limits/guidelines e.g. permit limits, BC Water Quality Guidelines etc. Any exceedances of respective regulatory limits/guidelines must be clearly highlighted. Any missed sampling events/missing data must be identified with an explanation provided. Reporting frequency may be reduced upon a history of compliance and by written confirmation from the BCER. These reports shall be submitted to Waste.Management@bc-er.ca. A copy of the reports shall be provided to each First Nation consulted with regarding this subject permit, and also made publicly available on the Woodfibre LNG Environmental Reporting webpage."

The site layout is shown in Figure 1 at the end of this report. Sedimentation pond photographs are included in Appendix A, and monitoring results are tabulated in Appendix B through Appendix G for contact water and receiving environment samples.

1. Current Conditions

The Construction Phase of the Woodfibre LNG Export Facility commenced in October 2023. Early stage civil works are ongoing, and these include site grading, levelling, bedrock excavation and sedimentation pond and WWTP construction. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure was initiated and has continued through the May 12 – May 18 monitoring period. The East WWTP, and East and West sedimentation ponds have been completed, and the West WWTP is being assembled. The PE- 111578 water management facilities that are completed or were under construction during the reporting period are shown in Figure 1.

The East and West Catchment contact water conveyance ditches described in PE-111578 will be constructed following completion of site preparation activities (*e.g.,* site grading, bedrock excavation) along the ditch lines. Until the ditches are operational, non-contaminated contact waters are managed to remain on site or are directed to the East Sedimentation Pond. Contaminated contact waters are contained and directed to the East WWTP.

A revised schedule is being developed to complete the installation of the East Sedimentation Pond permanent outfall structure. Until those structures are constructed, a temporary discharge system (*i.e.*, pump, hosing and diffusor) is used to convey East Sedimentation Pond effluent to the authorized discharge location when necessary for the discharge of excess water, and if the effluent water quality meets the requirements set out in PE-111578.

The West Sedimentation Pond is complete, except for the outfall structure, and has not been commissioned for discharge. The West WWTP is being assembled. Commissioning of the pond is anticipated for June, and commissioning of the WWTP will follow shortly thereafter. The schedule for completion of the pond outfall structure is being revised.

The completed non-contact water diversion ditch west of Mill Creek was commissioned for use on April 7. The diversion ditch discharges to Mill Creek at OUT-06 (Figure 1). Monitoring stations OUT-01, OUT-02, and OUT-11 at pre-existing culvert outlets have been established. Non-contact water diversion ditches leading to these outlets will be upgraded and extended, later in the construction schedule.

Pilot testing of the East WWTP continued during the monitoring period (May 12 – May 18). Contaminated and potentially contaminated contact waters from excavations within the East Catchment were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond (representing the majority of the WWTP influent flow). A total of 3,115 m^3 treated WWTP effluent was discharged to the East Sedimentation Pond.

The East and West Sedimentation Ponds did not discharge May 12 – May 18. Aerial views of the ponds on May 17 are shown in Figure 2 and Figure 3. Clean-out of the East Sedimentation Pond

continued through the monitoring period including temporary dewatering to the West Sedimentation Pond May 13 – 15. After the East Sedimentation Pond was drained and sediments removed, the pond began receiving treated water from the East WWTP. The water temporarily stored in the West Sedimentation Pond was directed to the East WWTP for treatment.

2. Monitoring Summary

The PE-111578 authorized works were under construction during the May 12 – May 18 monitoring period. Compliance monitoring stations are progressively established by as water management infrastructure is completed. Monitoring is conducted by the on-site Environmental Monitors (Roe Environmental). Analytical samples are submitted by Roe Environmental to ALS Environmental in Burnaby, BC, for testing.

The following monitoring stations have been established (Figure 1):

- Creek water (SW-01, SW-02, SW-03, SW-04, SW-07).
- Howe Sound reference and IDZ locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).
- Non-contact diversion ditch outlets (OUT-01, OUT-02, OUT-06, and OUT-11).
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, SP-E-NE, and SP-E-NW).

Stations SW-01, SW-02, SW-03, SW-04, SW-07, OUT-02, WWTP-E-IN, WWTP-E-OUT, SP-E-NE and SP-E-IN-2 were monitored during the monitoring period (May 12 – May 18). Sampling dates and parameters tested are summarized in Table 1.

Table 1: Summary of PE-111578 monitoring samples collected May 12 – May 18.

Sampling Date	Sample	Description	Parameters Tested
May 12, 2024	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field Parameters.
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
May 13, 2024	SP-E-NE	NE corner of East Sedimentation Pond proximal to the effluent intake	Field and Physical Parameters, Total, Dissolved and Speciated Metals.
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
May 14, 2024	SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, and Methyl Mercury.
	SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)	
	SW-07	Upstream Mill Creek (at the diversion inlet)	
	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field Parameters.
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
May 15, 2024	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Glycols, Oil and Grease.
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field, Physical and General Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.
May 16, 2024	OUT-02	Non-Contact Water Diversion Ditch Outlet	Field, Physical & General Parameters, Total, Dissolved and Speciated Metals, Glycols, Oil and Grease, and Methyl Mercury.
	SW-01	Lower Reach of Woodfibre Creek (near the mouth)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Glycols, Oil and Grease, and Methyl Mercury.
	SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)	
	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field Parameters.
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
May 17, 2024	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs & PAHs.
	SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond	
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	
May 18, 2024	SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	Field Parameters.
	WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre-treatment step and additional contaminant sources within the East catchment area	
	WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond	

3. Water Quality Results

3.1 Overview

Field measurements and analytical results for the monitoring period (May 12 – May 18) that were available at the time of reporting are listed below in Table 2. Analytical results not available at the time of reporting will be included in future weekly reports when they are available for the following samples:

- SW-02, SW-03, and SW-07 collected May 14 (only field results available)
- WWTP-E-IN, WWTP-E-OUT, and SP-E-NE collected May 15 (only field results available)
- OUT-02 collected May 16 (only field results available)
- SW-01 and SW-04 collected May 16 (only field results available)

Analytical results for samples collected May 8 – 10 and described in Report #13 were available at the time of reporting for parameters listed in Table 2. Results for methyl mercury, dioxins and furans are pending for the following samples and will be included in future weekly reports when available:

- WQR1, WQR2, IDZ-E1, and IDZ-E2 collected on May 8 (methyl mercury, dioxins and furans)
- SW-02, SW-03, and SW-07 collected on May 9 (dioxins and furans only)
- OUT-02 collected May 10 (methyl mercury only)
- SW-01 and SW-04 collected on May 10 (methyl mercury, dioxins and furans)

Table 2: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #14.

Sample	Description	Sampling Date	Parameters Reported
IDZ-E1-0.5	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface	May 8, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.
IDZ-E1-2m	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface		
IDZ-E1-SF	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor		
IDZ-E2-0.5	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface		
IDZ-E2-2m	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m below surface		
IDZ-E2-SF	IDZ monitoring station 20-30 m southwest of East Sedimentation Pond discharge (SP-E-Out); 2 m above the seafloor		
WQR1-0.5	Reference site located northeast of East Creek 500 m northeast of the Project boundary; 0.5 m below surface.		
WQR1-2m	Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m below surface.		
WQR1-SF	Reference site located northeast of East Creek 500 m northeast of the Project boundary; 2 m above the seafloor.		
WQR2-0.5	Reference site located south of Woodfibre Creek 500 m south of the Project boundary; 0.5 m below surface.		
WQR2-2m	Reference site located south of Woodfibre Creek 500 m south of the Project boundary; 2 m below surface.		
WQR2-SF	Reference site located south of Woodfibre Creek 500 m south of the Project boundary; 2 m above the seafloor.		
SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)		
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	May 9, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.
SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)		
SW-07	Upstream Mill Creek (at the diversion inlet)		
OUT-02	Non-Contact Water Diversion Ditch Outlet	May 10, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, and Hexavalent Chromium.
SW-01	Lower Reach of Woodfibre Creek (near the mouth)		Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.
SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area		Field, Physical & General Parameters, Total, Dissolved and Hexavalent Chromium.
WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond		
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	May 13, 2024	Field and Physical Parameters, Total, Dissolved Metals, and Hexavalent Chromium.
WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area		
WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond		
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	May 17, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.
SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond		
WWTP-E-IN	Combined influent to the East WWTP from chromium reduction pre- treatment step and additional contaminant sources within the East catchment area		
WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond		

3.2 East Sedimentation Pond

The East Sedimentation Pond influent and effluent results are screened against PE-111578 discharge limits. Parameters without a discharge limit are screened against BC, Canadian and Federal water quality guidelines (WQGs) for the protection of marine water aquatic life. Influent water is not discharged from site, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters, discharge limits and WQGs are summarized in Table B- 1 (analytical results) and Table B-2 (field measurements) of Appendix B.

During the monitoring period, the East Sedimentation effluent in-pond (SP-E-NE) field measurements met PE-111578 discharge limits and WQGs, except dissolved oxygen on May 12 and 15 (6.44 and 7.62 mg/L, respectively). The in-pond samples (station SP-E-NE) collected May 13 and May 17 proximal to the effluent intake (Figure 1) were tested for total and dissolved metals, hexavalent chromium, and PAHs (May 17 only) and met PE-111578 discharge limits except total vanadium on May 13. In the May 13 in-pond sample, the total vanadium concentration was 1.3 times above the PE-111578 discharge limit. The in-pond samples collected on May 13 and May 17 met WQGs for parameters without discharge limits except total hexavalent chromium which was detected at a concentration of 0.00221 mg/L on May 13, 1.5 times above the WQG value of 0.0015 mg/L. The East Sedimentation Pond did not discharge May 12 – May 18, therefore the results of the in-pond samples are not considered exceedances.

3.3 East Wastewater Treatment Plant

The East WWTP influent and effluent results are screened against the minimum discharge objectives (MDOs) which the WWTP was designed to meet. Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet MDOs, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field measurements, and MDOs are summarized in Table C-1 (analytical results) and Table C-2 (field measurements) of Appendix C. Screening results are summarized in Table 3 for parameter concentrations that are above a MDOs.

The East WWTP discharged treated effluent to the East Sedimentation Pond each day of the reporting period (May 12 – May 18). Field measurements were collected each day at the influent and effluent stations, WWTP-E-IN and WWTP-E-OUT, respectively. Analytical samples were collected from the influent and effluent stations on May 13 and 17 and were measured for general parameters, total and dissolved metals, hexavalent chromium, and PAHs (May 17 only). Analytical results for samples collected from the influent and effluent stations on May 10 were available at the time of reporting. Analytical samples were also collected from the influent and effluent stations on May 15; however, results were not available at the time of reporting and will be included in future reports when available.

During the monitoring period, East WWTP effluent (WWTP-E-OUT) water quality ranged from pH 6.7 to 8.3, turbidity ranged 0.86 to 5.83 NTU and dissolved oxygen ranged from 6.14 to 14.4 mg/L (Appendix C, Table C-2). The effluent field measurements met the MDOs, except pH on May 18 (pH 6.7) and dissolved oxygen on May 12 and 15 (6.34 and 6.14 mg/L, respectively). Pilot testing of the East WWTP is underway and occasional, deviations from MDOs may occur during this phase of WWTP operation.

Analytical results for the May 10, 13, and 17 East WWTP effluent sample (WWTP-E-OUT) met MDOs, except for total vanadium, total zinc, and total hexavalent chromium. The total vanadium concentrations in the effluent samples from May 10, 13, and 17 were 2.3, 1.7, and 1.5 times greater, respectively, than the MDO (0.005 mg/L) and were predominately present in the dissolved form. The total vanadium concentration at the effluent station was comparable to the concentration observed at the influent station (WWTP-E-IN). Total zinc concentrations in samples collected from the East WWTP effluent on May 10 and May 17 were 1.4 and 1.5 times greater, respectively, than the MDO (0.01 mg/L). Total zinc concentrations are only partially attributed to the dissolved fraction. The total hexavalent chromium concentration in the effluent sample collected on May 10 was 1.1 times greater than the MDO (0.0015 mg/L) and is predominantly in the dissolved form.

Table 3:
Summary of MDO Exceedances for the East WWTP at Effluent Station WWTP-E-OUT.

Parameter	Units	MDO	N	N >MDO	Commentary
Field pH	s.u.	7.0 - 8.7	7	1	Field pH was 0.30 s.u. below the lower MDO for pH in the field measurement collected from WWTP-E-OUT on May 18 (pH 6.7). Monitoring results indicate from May 12 – 17, the East WWTP produced effluent that met MDO for field pH. Pilot testing of the East WWTP is underway and occasional, deviations from MDOs may occur during this phase of WWTP operation.
Field DO	mg/L	>=8	7	2	Field DO measurements were below the lower limit MDO for DO in the field measurement collected from WWTP-E-OUT on May 12 and 15 (6.34 and 6.14 mg/L). Pilot testing of the East WWTP is underway and occasional, deviations from MDOs may occur during this phase of WWTP operation.
Total Vanadium	mg/L	0.005	3	3	The total vanadium concentrations were 1.5 to 2.3 times greater than the MDO in the samples from WWTP-E-OUT collected on May 10 (0.0116 mg/L), May 13 (0.00864 mg/L) and May 17 (0.00727 mg/L). Process adjustments are underway as part of the WWTP pilot trials to improve vanadium removal.
Total Zinc	mg/L	0.01	3	2	The total zinc concentrations in the samples from WWTP-E-OUT collected on May 10 (0.0137 mg/L) and May 17 (0.0146 mg/L) were 1.4 and 1.5 times greater than the MDO, respectively. Process adjustments are underway as part of the WWTP pilot trials to improve zinc removal.
Total Hexavalent Chromium	mg/L	0.0015	3	1	The total hexavalent concentration was 1.1 times greater than the MDO in the sample from WWTP-E-OUT collected on May 10 (0.00171 mg/L). Process adjustments are underway as part of the WWTP pilot trials to improve chromium removal.

MDO = Minimum discharge objective.
N = number of samples.
Non-detect results are screened using the detection limit value.

3.4 Non-Contact Water Diversion Ditch Outlets

Water quality results for non-contact water are screened against BC, Canadian and Federal WQGs for the protection of freshwater aquatic life. The analytical results, field parameters and WQGs are summarized in Appendix D.

Analytical results for the May 10 non-contact water diversion ditch outlet sample (OUT-02) described in Weekly Report #13 were available at the time of reporting, and met WQGs.

3.5 Freshwater and Estuarine Water Receiving Environment

Freshwater and estuarine water receiving environment samples are screened against BC, Canadian and Federal WQGs for the protection of freshwater or estuarine water aquatic life. The analytical results, field parameters and WQGs are summarized in Appendix E and Appendix F.

Analytical results were available for the May 9 and 10 samples discussed in Weekly Report #13 for freshwater and estuarine water receiving environment samples collected at Woodfibre Creek (station SW-01), Mill Creek (stations SW-02, SW-03 and SW-07) and East Creek (station SW-04). Analytical results for May 14 and 16 freshwater and estuarine water monitoring (Table 1) were not available at the time of reporting. Field measurements will be reported when the corresponding analytical results are available.

All stations are freshwater except the estuarine water collected near the mouth of Mill Creek (station SW-03). Parameter concentrations met WQGs at Mill Creek stations, except field pH, total aluminum, and dissolved copper (stations SW- 02 and SW-07) and at Woodfibre and East Creek stations, except dissolved copper at Woodfibre Creek station SW-04 (Appendix E). Field pH and the concentrations of total aluminum, and dissolved copper were within the concentration ranges observed in the pre-construction baseline monitoring program and are therefore not considered to be exceedances.

3.6 Marine Water Receiving Environment

Marine water receiving environment samples are screened against BC, Canadian and Federal WQGs for the protection of marine water aquatic life. Parameter concentrations above a WQG value, but within the range of values observed in the baseline monitoring program are considered to represent the natural condition of the water and are not flagged as exceedances. The analytical results, field parameters and WQGs are summarized in Appendix G (Table G-1 and G-2).

Analytical results were available for the May 8 samples discussed in Weekly Report #13 for marine receiving environment stations IDZ-E1, IDZ-E2, WQR1, and WQR2 at 0.5 and 2 m below the water surface and 2 m above the seafloor, and met WQGs except for total boron in most samples as well as dissolved oxygen in two samples collected at 2 m above the seafloor. The concentrations

of total boron in the samples ranged from 0.78 to 3.91 mg/L and were above the WQG (1.2 mg/L) in all samples from IDZ-E2 and WQR1 and in samples collected from 2 m above the seafloor at IDZ-E1 and WQR2. Field dissolved oxygen values were below the lower limit of the WQG (8.0 mg/L) in samples collected from 2 m above the seafloor at IDZ-E2 and WQR1 (7.59 and 6.27 mg/L, respectively). The reported concentrations of total boron and dissolved oxygen observed in the marine water samples are within the concentration ranges observed in the pre-construction baseline monitoring program and are therefore not considered to be exceedances.

4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 4). The evaluation includes a review of field and lab QC, completeness of the weekly report (*i.e.*, pending data), completeness of the monitoring program, evaluation of compliance and review of water management activities. Any items flagged for follow-up will be carried forward in future reports until they are closed.

Table 4: Weekly Report QC Evaluations and Ongoing Items.

QC Procedure	Observation	Investigation/Resolution
Reporting Period (May 12 – May 18, Report #14)		
Monitoring Program Evaluation	PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established.	The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is under construction. The West Sedimentation Pond is not commissioned for discharge and did not discharge. The non-contact water diversion ditch that discharges at station OUT-06 has been commissioned, and stations for pre-existing outfalls OUT-01, OUT-02, and OUT-11 have also been established.
Pending Data	Analytical results for samples collected May 14 – 16 were not reported.	Complete analytical results were not available at the time of preparing Report #14 and are expected to be available for the next reporting period. This item remains open.
	Methyl mercury, dioxin and furan results for samples collected May 8 - 10 were not reported.	Methyl mercury, dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected in late June. This item remains open.
Ongoing Items from Previous Weekly Reports		
Report #10: Water Management Evaluation	April 16 monitoring results for East Sedimentation Pond influent (station SP-E-IN-2) indicated contaminated contact water was directed to the pond.	On April 16, non-contaminated contact water that was previously pumped to a baker tank for storage was transferred to the sedimentation pond as influent. On April 18, after receiving the test results, site staff determined that the baker tank was previously used to store contaminated contact water and that residues from the tank were likely entrained in the water that was transferred from the baker tank to the pond influent. Corrective actions were implemented by site staff on April 18 and included suspending further discharges until WQ monitoring indicated PAHs have been removed from the sedimentation pond, and recirculating water from the baker tanks used for storing non-contaminated contact water through the East WWTP until influent PAH concentrations indicate residual contamination has been removed. Site staff collected a pond sample on April 18 proximal to the intake for the effluent discharge pump located in the northeast corner of the pond (SP-E-POND). PAHs met WQG in the April 18 sedimentation pond sample indicating the residual PAHs were removed from the pond waters. Additional influent monitoring was conducted April 29 (SP-E-IN-2). PAHs were detected in the influent sample, and this is attributed to elevated TSS in the sample (192 mg/L). Note the concurrent April 29 East Sedimentation Pond effluent sample met WQGs for PAHs. Additional influent monitoring was conducted May 17 (SP-E-IN-2). PAHs were detected in the influent sample, and this is attributed to elevated TSS in the sample (20 mg/L). Further investigation of the potential source is ongoing. Note the concurrent May 17 East Sedimentation In-Pond effluent sample (SP-E-NE) met WQGs for PAHs. This item remains open pending the results of additional influent monitoring for PAHs.
Report #12: Pending Data	Methyl mercury, dioxin and furan results for samples collected April 28-30 were not reported.	Methyl mercury, dioxins and furans results were not complete at the time of reporting. Testing of these parameters typically requires up to 4 weeks to complete. The pending results are expected at the end of May. This item remains open.
Report #12: Compliance Evaluation	May 3 monitoring results for East Sedimentation Pond discharge exceeded the PE-111578 limits for total Cu, Pb, V, and Zn and WQG for total Hg.	Discharge from the East Sedimentation Pond was suspended following receipt of May 3 analytical results on May 4. Follow-up investigation and monitoring concluded that some settled sediments in the East Sedimentation Pond were likely re-suspended during discharge, resulting in the discharge limit exceedances observed in the May 3 sample. Removal of accumulated sediment commenced May 8 and was completed May 15. Follow-up monitoring results are pending, therefore this item remains open.
Report #13: Compliance Evaluation	May 8 monitoring results for East Sedimentation Pond discharge exceeded the PE-111578 limits for total vanadium and WQG for total hexavalent chromium.	Discharge from the East Sedimentation Pond was conducted based on favorable water quality for an in-pond sample collected May 6 (SP-E-NE). To confirm the effluent would continue to meet discharge limits during discharge, discharge was activated for 30 minutes on May 8. Discharge was stopped after effluent sampling was completed. Follow-up investigation determined the exceedance was caused by the dissolved form of vanadium that is not removed by particle settling in the sedimentation pond and has been accumulating in the sedimentation pond waters since April 29. Removal of accumulated sediment commenced May 8 and was completed May 15. The East Pond was then refilled with East WWTP treated effluent. Discharge from the East Sedimentation Pond will remain suspended until follow-up monitoring data indicate dissolved vanadium has been reduced, and that pond water meets discharge limits. This item remains open.
Report #13: WWTP Performance Evaluation	May 6 monitoring results for East WWTP indicate dissolved vanadium was not being removed by the treatment process.	The total vanadium concentration was predominately in the dissolved form and dissolved vanadium concentrations were comparable in the East WWTP influent (WWTP-E-IN; 0.00614 mg/L) and the effluent (0.00606 mg/L). Process adjustments are underway to improve vanadium removal as part of the WWTP pilot trials. This item remains open.
Report #13: Pending Data	Methyl mercury, dioxin and furans results for samples collected May 8 – 10 have not been reported.	Available analytical results are discussed in Sections 3.2 through 3.6 of Report #14. This item remains open.

Notes:
Result QA/QC screening includes the evaluation of field and lab QC results, comparison of total and dissolved metal results and review for modified detection limits.
Pending data are outstanding results from monitoring samples reported in the current or previous weekly reports.
Monitoring program evaluation is an assessment of the completeness of the monitoring program compared to PE-111578 requirements.

5. Closure

This weekly report is a desktop review by Lorax of the PE-111578 discharge and compliance monitoring program records, reports and results provided by Woodfibre LNG and prime contractor McDermott International and their sub-contractors. The records reviewed and analyzed by Lorax include ALS Environmental laboratory test reports and site reports (from Roe Environmental, LB LNG, McDermott and Woodfibre LNG). Verbal or electronic communications between Lorax, and Roe Environmental, LB LNG, McDermott, Woodfibre LNG and Keystone Environmental staff are conducted as needed to confirm the information presented in this report.

Regards,

LORAX ENVIRONMENTAL SERVICES LTD.

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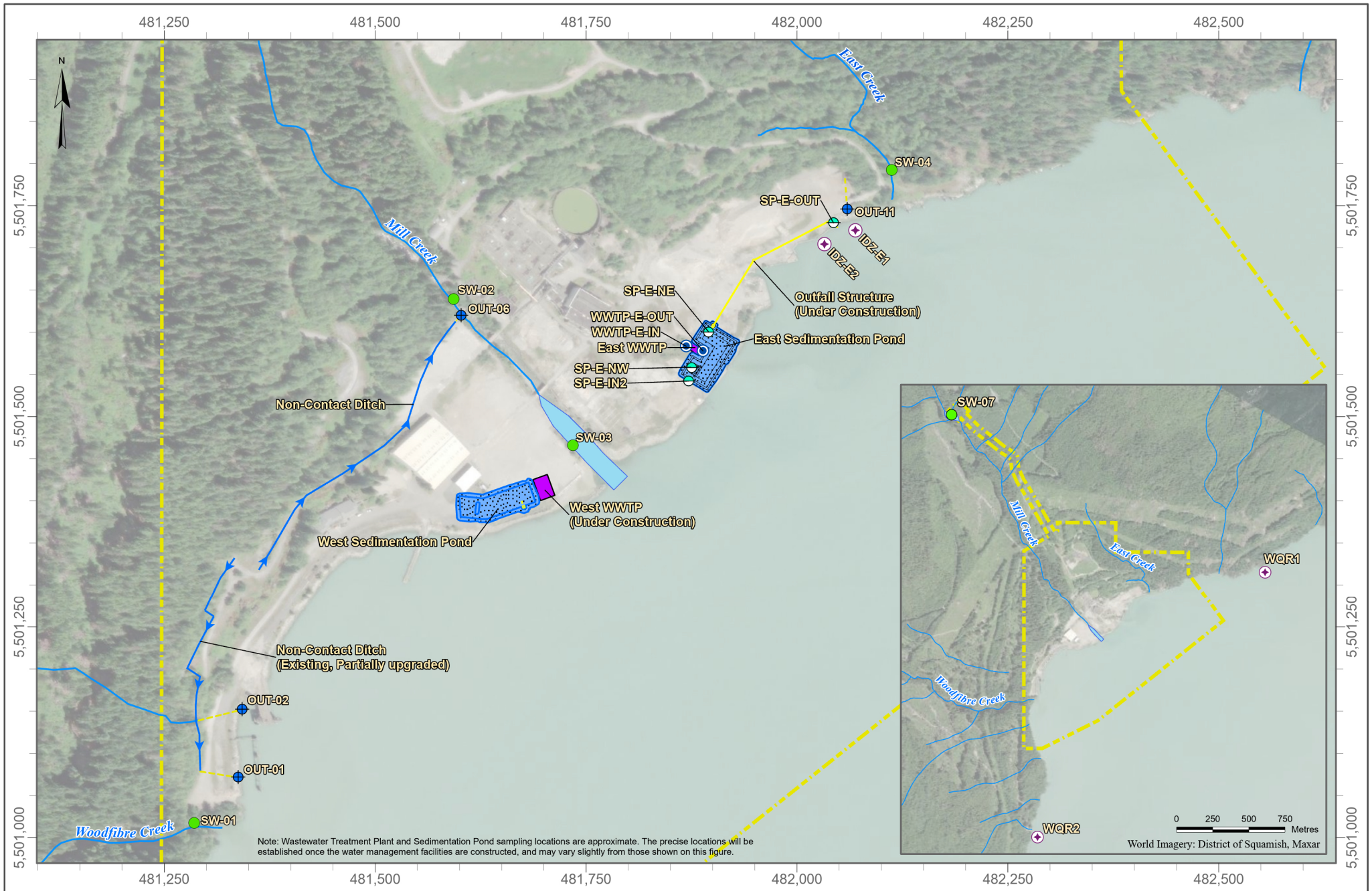

LEGEND

- Freshwater Monitoring Station
- Marine Water Monitoring Station
- Certified Project Area
- Waterbody
- Watercourse
- Non-Contact Diversion Ditch
- Outfall
- Culvert Pipe
- Clean Water Diversion Discharge Station
- Sediment Pond
- Sediment Pond Monitoring Stations (Water Quality)
- WWTP

DATE SAVED:	May 23, 2024
DRAWN BY:	DM
REVIEWED:	PM
VERSION:	1

Coordinate System: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator
Datum: North American 1983
Units: Metre

1:6,000

0 50 100 150 Metres

CLIENT: Woodfibre LNG

LORAX ENVIRONMENTAL

PROJECT:

Woodfibre LNG Project Construction Phase

TITLE: Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (May 18, 2024)

PROJECT #: A633-7

FIGURE: 1

P:\@Drafting\Woodfibre\Drafting Figures\APRX\WLNG Construction Phase 2024\WLNG Construction Phase 2024 - Weekly Reporting.aprx Figure 1 Monitoring and Compliance Locations

Appendix A: East and West Catchment Photographs

Figure 2. Aerial view of the East WWTP and East Sedimentation Pond showing the placement of two sediment curtains (May 17, 2024).

Figure 3: Aerial view showing the current stage of construction for the West Sedimentation Pond and West WWTP (located west of pond) on May 17, 2024. Water from the East Sedimentation Pond was transferred to the West Sedimentation Pond on May 13 – 15 to accommodate the clean-out of sediment at the bottom of the East Sedimentation Pond.

Appendix B: East Sedimentation Pond Results

Table B-1: Summary of East Sedimentation Pond Water Quality Results Received at the Time of Reporting.

Parameter	Units	Lowest Applicable Marine Water Guideline [1, 2]		PE-111578 Discharge Limit *	East Sedimentation Pond			
					Effluent	In-Pond at Effluent Location	In-Pond at Effluent Location	Influent
					SP-E-OUT	SP-E-NE	SP-E-NE	SP-E-IN-2
					VA24B0178-013	VA24B0581-001	VA24B1184-003	VA24B1184-004
		Long Term	Short Term		2025-05-08 10:12	2025-05-13 11:45	2025-05-17 15:16	2025-05-17 15:44
General Parameters								
pH - Field	pH units	- [6]	-	5.5 - 9.0	7.39	8.30	8.30	8.80
Specific Conductivity - Field	µS/cm	-	-	-	1674	4497	2472	2893
Temperature - Field	°C	-	-	-	17.9	18.6	17.8	18.5
Salinity - Field	ppt	-	-	-	0.99	2.77	1.50	1.74
Turbidity - Field	NTU	-	-	-	1.01	1.0	0.33	19.22
TSS	mg/L	- [6]	-	25	<3	<3	<3	20.2
Dissolved Oxygen - Field	mg/L	>=8	-	-	8.34	10.39	10.02	10.42
Anions and Nutrients								
Sulphate	mg/L	-	-	-	89.2	-	-	-
Chloride	mg/L	-	-	-	457	-	-	-
Fluoride	mg/L	-	1.5	-	<0.2	-	-	-
Ammonia ($N\text{-}NH_3$)	mg/L	Variable [3]	Variable [3]	-	0.0092	-	-	-
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	-	<0.01	-	-	-
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	339	-	0.113	-	-	-
Total Metals								
Aluminum, total (T-Al)	mg/L	-	-	-	0.154	0.117	0.102	1.03
Antimony, total (T-Sb)	mg/L	-	0.27 [4]	-	0.00199	0.0026	0.0023	0.00258
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00324	0.00272	0.00332	0.00327
Barium, total (T-Ba)	mg/L	-	-	-	0.0155	0.044	0.0225	0.0354
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.132	0.424	0.119	0.138
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	0.0000106	<0.000015	<0.000015	0.0000422
Chromium, total (T-Cr)	mg/L	-	-	-	0.00181	0.00267	0.00115	0.00225
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0001	<0.0002	<0.0002	0.00042
Copper, total (T-Cu)	mg/L	- [6]	- [6]	0.0043	0.00169	0.00126	<0.001	0.00322
Iron, total (T-Fe)	mg/L	-	-	-	0.016	<0.02	0.038	0.8
Lead, total (T-Pb)	mg/L	- [6]	- [6]	0.0035	0.00031	0.000121	0.000127	0.00274
Manganese, total (T-Mn)	mg/L	-	-	-	0.00111	0.00268	0.0027	0.0253
Mercury, total (T-Hg) [5]	mg/L	0.000016	-	-	<0.000005	<0.000005	0.0000057	0.0000083
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0479	0.0323	0.0387	0.0369
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.0005	0.00198	0.00122	0.0016
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000262	0.000177	0.000183	0.00018
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00001	<0.00002	<0.00002	<0.00002
Thallium, total (T-Tl)	mg/L	-	-	-	<0.00001	<0.00002	<0.00002	<0.00002
Uranium, total (T-U)	mg/L	-	-	-	0.0262	0.0157	0.0267	0.0232
Vanadium, total (T-V)	mg/L	- [6]	-	0.0081	0.0118	0.0108	0.00727	0.00960
Zinc, total (T-Zn)	mg/L	- [6]	- [6]	0.0133	<0.003	<0.006	<0.006	0.0125
Hexavalent Chromium, total	mg/L	0.0015	-	-	***0.00156***	***0.00221***	0.0007	0.00098
Dissolved Metals								
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.000005	<0.000025	<0.000015	<0.000035
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00162	0.00116	0.00077	0.00188
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.01	<0.05	<0.02	0.179
Lead, dissolved (D-Pb)	mg/L	-	-	-	0.000095	<0.00025	<0.0001	0.00139
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00057	0.00256	0.00134	0.0105
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.352	0.877	0.468	0.52
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.0121	0.0105	0.00716	0.00837
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0015	<0.005	<0.002	0.0066
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	mg/L	0.006	-	-	<0.00001	-	<0.00001	<0.00001
Acridine	mg/L	-	-	-	<0.00001	-	<0.00001	<0.00001
Anthracene	mg/L	-	-	-	<0.00001	-	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	-	<0.00001	-	<0.00001	0.000012
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005	-	<0.000005	***0.0000135***
Chrysene	mg/L	0.0001	-	-	<0.00001	-	<0.00001	<0.00002
Fluoranthene	mg/L	-	-	-	<0.00001	-	<0.00001	0.000044
Fluorene	mg/L	0.012	-	-	<0.00001	-	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	-	<0.00001	-	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	-	<0.00001	-	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	-	<0.00005	-	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	-	<0.00002	-	<0.00002	0.000024
Pyrene	mg/L	-	-	-	<0.00001	-	<0.00001	0.000032
Quinoline	mg/L	-	-	-	<0.00005	-	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)								
Benzene	mg/L	0.11	-	-	<0.0005	-	-	-
Ethylbenzene	mg/L	0.25	-	-	<0.0005	-	-	-
Methyl-tert-butyl-ether	mg/L	5	0.44	-	<0.0005	-	-	-
Styrene	mg/L	-	-	-	<0.0005	-	-	-
Toluene	mg/L	0.215	-	-	<0.0004	-	-	-
Total Xylenes	mg/L	-	-	-	<0.0005	-	-	-
Chlorobenzene	mg/L	0.025	-	-	<0.0005	-	-	-
1,2-Dichlorobenzene	mg/L	0.042	-	-	<0.0005	-	-	-

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
Results in orange text exceeded the PE11578 East Sedimentation Pond Discharge Limit.
* The PE111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-Out).
[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).
[3] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[6] Where discharge limits apply, the water quality guideline was not evaluated.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Table B-2: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

Station ID	Date	Time	Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen
			°C	mg/L	ppt	NTU	s.u.	µS/cm	
SP-E-NE	12-05-2024	9:38	18.7	6.44	1.79	2.55	8.0	2992	No
SP-E-NE	13-05-2024	12:07	18.6	10.39	2.77	1.02	8.3	4497	No
SP-E-NE	14-05-2024	16:29	19.7	8.64	1.84	1.57	8.4	3131	No
SP-E-NE	15-05-2024	13:19	20.7	7.62	1.93	149	8.0	3355	No
SP-E-NE	16-05-2024	10:52	19.0	8.39	1.91	3.59	8.3	3205	No
SP-E-NE	17-05-2024	15:16	17.8	10.02	1.5	0.33	8.3	2472	No
SP-E-IN-2	17-05-2024	15:44	18.5	10.42	1.74	19.22	8.8	2893	No
SP-E-NE	18-05-2024	12:33	16.2	9.96	1.71	0.86	8.2	2699	No

No water sources were pumped to the East Sedimentation Pond May 12 – 16, and May 18 therefore station SP-E-IN-2 was not sampled.
No discharge from the East Sedimentation Pond occurred May 12 – 18.

Appendix C: East Wastewater Treatment Plant Results

Table C-1: Summary of East Wastewater Treatment Plant Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Minimum Discharge Objective[1]	East WWTP					
			Influent	Effluent	Influent	Effluent	Influent	Effluent
			WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT
			VA24B0452-007	VA24B0452-008	VA24B0581-002	VA24B0581-003	VA24B1184-002	VA24B1184-001
			2024-05-10 10:54	2024-05-10 10:42	2024-05-13 12:35	2024-05-13 12:10	2024-05-17 15:29	2024-05-17 15:07
General Parameters								
pH - Field	pH units	7.0 - 8.7	***9.0***	8.2	8.4	8.3	7.2	7.7
Specific Conductivity - Field	µS/cm	-	885	3320	2161	3589	2978	2576
Temperature - Field	℃	-	17.0	17.5	19.5	18.8	20.3	17.9
Salinity - Field	ppt	-	0.52	2.06	1.25	2.17	1.72	1.58
Turbidity - Field	NTU	-	22.9	0.38	6.47	0.9	4.45	1.26
TSS	mg/L	-	40.6	<3	6.6	<3	3	<3
Dissolved Oxygen - Field	mg/L	>=8	9.62	13.18	***7.35***	14.35	***7.82***	***7.76***
Anions and Nutrients								
Sulphate	mg/L	-	54.5	181	-	-	-	-
Chloride	mg/L	-	224	1070	-	-	-	-
Fluoride	mg/L	-	0.114	<0.4	-	-	-	-
Ammonia (N-NH_3)	mg/L	Variable [4]	0.0058	0.0440	-	-	-	-
Nitrite (N-NO_2)	mg/L	-	<0.005	0.214	-	-	-	-
Nitrate (N-NO_3)	mg/L	3.7	<0.025	0.136	-	-	-	-
Total Metals								
Aluminum, total (T-Al)	mg/L	-	2.15	0.107	0.485	0.113	0.422	0.089
Antimony, total (T-Sb)	mg/L	-	0.00207	0.00219	0.00245	0.00241	0.00244	0.00242
Arsenic, total (T-As)	mg/L	0.0125	0.00347	0.00285	0.00302	0.00246	0.00296	0.00313
Barium, total (T-Ba)	mg/L	-	0.0238	0.031	0.0247	0.0219	0.0305	0.0247
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.098	0.23	0.187	0.374	0.138	0.119
Cadmium, total (T-Cd)	mg/L	0.00012	<0.0001	<0.00001	<0.000035	<0.00002	<0.000025	<0.000015
Chromium, total (T-Cr)	mg/L	-	0.00315	0.00215	0.00213	0.00267	0.00148	0.00108
Cobalt, total (T-Co)	mg/L	-	0.00073	<0.0002	0.00022	<0.0002	<0.0002	<0.0002
Copper, total (T-Cu)	mg/L	0.002	***0.00666***	0.00162	***0.00293***	0.00175	***0.00222***	0.00154
Iron, total (T-Fe)	mg/L	-	1.43	<0.02	0.245	<0.02	0.235	<0.02
Lead, total (T-Pb)	mg/L	0.002	***0.00643***	0.000163	0.00149	0.000213	0.000819	0.000157
Manganese, total (T-Mn)	mg/L	-	0.0456	0.00173	0.0116	0.00188	0.0112	0.00178
Mercury, total (T-Hg)	mg/L	0.000016	***0.0000203***	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0327	0.0378	0.035	0.0319	0.0365	0.0368
Nickel, total (T-Ni)	mg/L	0.0083	0.00145	<0.001	<0.001	0.00212	0.00112	0.00128
Selenium, total (T-Se)	mg/L	0.002	0.000205	0.000171	0.000197	0.000205	0.000211	0.00018
Silver, total (T-Ag)	mg/L	0.0015	0.000016	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Thallium, total (T-Tl)	mg/L	-	0.000018	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Uranium, total (T-U)	mg/L	-	0.0193	0.019	0.019	0.0158	0.0229	0.0238
Vanadium, total (T-V) [8]	mg/L	0.005	***0.0115***	***0.0116***	***0.00983***	***0.00864***	***0.00850***	***0.00727***
Zinc, total (T-Zn)	mg/L	0.01	***0.0243***	***0.0137***	***0.0232***	0.0087	***0.820***	***0.0146***
Hexavalent Chromium, total	mg/L	0.0015	0.00137	***0.00171***	0.00142	0.0014	0.00086	0.00068
Dissolved Metals								
Cadmium, dissolved (D-Cd)	mg/L	-	0.0000387	<0.000015	<0.00002	<0.000015	<0.000015	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	0.00344	0.00151	0.0019	0.00158	0.0014	0.00081
Iron, dissolved (D-Fe)	mg/L	-	0.328	<0.02	<0.02	<0.02	<0.02	<0.02
Lead, dissolved (D-Pb)	mg/L	-	0.00222	<0.0001	<0.0001	0.000154	<0.0001	<0.0001
Manganese, dissolved (D-Mn)	mg/L	-	0.0141	0.00146	0.00121	0.00145	0.00511	0.00093
Strontium, dissolved (D-Sr)	mg/L	-	0.211	0.630	0.413	0.624	0.527	0.495
Vanadium, dissolved (D-V)	mg/L	-	0.00894	0.0116	0.00862	0.00824	0.00752	0.00704
Zinc, dissolved (D-Zn)	mg/L	-	0.0078	0.0075	0.0124	0.0083	0.659	0.0425
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	mg/L	0.006	<0.00001	<0.00001	-	-	<0.00001	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001	-	-	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00001	<0.00001	-	-	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	0.000021	<0.00001	-	-	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	***0.0000268***	<0.000005	-	-	<0.000005	<0.000005
Chrysene	mg/L	0.0001	0.000032	<0.00001	-	-	<0.00001	<0.00001
Fluoranthene	mg/L	-	0.000082	<0.00001	-	-	0.000018	<0.00001
Fluorene	mg/L	0.012	<0.00001	<0.00001	-	-	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	-	-	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	-	-	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005	-	-	<0.00005	<0.00005
Phenanthrene	mg/L	-	0.000030	<0.00002	-	-	<0.00002	<0.00002
Pyrene	mg/L	-	0.000065	<0.00001	-	-	0.000015	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	-	-	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)								
Benzene	mg/L	0.11	<0.0005	<0.0005	-	-	-	-
Ethylbenzene	mg/L	0.25	<0.0005	<0.0005	-	-	-	-
Methyl-tert-butyl-ether	mg/L	5	<0.0005	<0.0005	-	-	-	-
Styrene	mg/L	-	<0.0005	<0.0005	-	-	-	-
Toluene	mg/L	0.215	<0.0004	<0.0004	-	-	-	-
Total Xylenes	mg/L	-	<0.0005	<0.0005	-	-	-	-
Chlorobenzene	mg/L	0.025	<0.0005	<0.0005	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.042	<0.0005	<0.0005	-	-	-	-

Notes:
[1] Minimum discharge objective for the WWTP effluent.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Table C-2: Summary of East Wastewater Treatment Plant Daily Field Parameters Received at the Time of Reporting.

Station ID	Date	Time	Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen
			°C	mg/L	ppt	NTU	s.u.	µS/cm	
WWTP-E-IN	12-05-2024	9:43	20.7	8.25	0.75	16.95	8.4	1360	No
WWTP-E-OUT	12-05-2024	9:49	18.5	6.34	1.75	1.03	8.1	2915	No
WWTP-E-IN	13-05-2024	13:12	19.5	7.35	1.25	6.47	8.4	2161	No
WWTP-E-OUT	13-05-2024	12:30	18.8	14.35	2.17	0.9	8.3	3589	No
WWTP-E-IN	14-05-2024	16:32	20.2	8.83	1.95	7.77	8.4	3341	No
WWTP-E-OUT	14-05-2024	16:28	19.9	9.32	1.71	1.06	7.8	2935	No
WWTP-E-IN	15-05-2024	12:53	20.1	7.74	1.61	19.77	8.3	2797	No
WWTP-E-OUT	15-05-2024	12:37	19.1	6.14	1.31	2.08	8.3	2238	No
WWTP-E-IN	16-05-2024	10:58	15.8	9.18	1.43	42.77	7.7	2734	No
WWTP-E-OUT	16-05-2024	10:48	19.1	7.41	1.92	5.83	7.4	3222	No
WWTP-E-IN	17-05-2024	15:29	20.3	7.82	1.72	4.45	7.2	2978	No
WWTP-E-OUT	17-05-2024	15:07	17.9	7.76	1.58	1.26	7.7	2576	No
WWTP-E-IN	18-05-2024	12:38	12.3	6.80	1.74	4.48	6.9	2502	No
WWTP-E-OUT	18-05-2024	12:28	16.6	10.57	1.81	0.86	6.7	2879	No

Appendix D: Non-Contact Diversion Outlet Results

Table D-1: Summary of Non-Contact Diversion Outlet Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station OUT-02 Non-Contact Water Diversion Ditch Outlet OUT-02 VA24B0452-003
		Long Term	Short Term	2024-05-10 12:30
General Parameters				
pH - Field	pH units	6.5 - 9.0	-	7.8
Specific Conductivity - Field	µS/cm	-	-	32.0
Temperature - Field	°C	-	-	13.0
Salinity - Field	ppt	-	-	0.02
Turbidity - Field	NTU	-	-	0.82
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	25.24
Anions and Nutrients				
Sulphate	mg/L	128 [3]	-	0.34
Chloride	mg/L	120	600	0.72
Fluoride	mg/L	-	0.45 [3]	<0.02
Ammonia (N-NH_3)	mg/L	1.55 [3]	8.07 [3]	<0.005
Nitrite (N-NO_2)	mg/L	0.02 [3]	0.06 [3]	<0.001
Nitrate (N-NO_3)	mg/L	3	32.8	0.0643
Total Metals				
Aluminum, total (T-Al)	mg/L	0.22 [3]	-	0.0954
Antimony, total (T-Sb)	mg/L	0.074	-	<0.0001
Arsenic, total (T-As)	mg/L	0.005	-	0.00011
Barium, total (T-Ba)	mg/L	1	-	0.00422
Beryllium, total (T-Be)	mg/L	0.00013	-	<0.0001
Boron, total (T-B)	mg/L	1.2	29	<0.01
Cadmium, total (T-Cd)	mg/L	0.000036 [3]	0.00023 [3]	<0.000005
Chromium, total (T-Cr) [5]	mg/L	0.001	-	<0.0005
Cobalt, total (T-Co)	mg/L	0.001	0.11	<0.0001
Copper, total (T-Cu)	mg/L	-	-	0.00071
Iron, total (T-Fe)	mg/L	0.3	1	0.016
Lead, total (T-Pb)	mg/L	0.0035 [3]	0.0050 [3]	0.000060
Manganese, total (T-Mn)	mg/L	0.77 [3]	0.82 [3]	0.0010
Mercury, total (T-Hg)	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	0.073	46	0.00136
Nickel, total (T-Ni)	mg/L	0.025 [3]	-	<0.0005
Selenium, total (T-Se)	mg/L	0.001	-	<0.00005
Silver, total (T-Ag)	mg/L	0.00005 [3]	0.0001 [3]	<0.00001
Thallium, total (T-Tl)	mg/L	0.0008	-	<0.00001
Uranium, total (T-U)	mg/L	0.0085	0.033	0.000274
Vanadium, total (T-V)	mg/L	0.12	-	<0.0005
Zinc, total (T-Zn)	mg/L	-	-	<0.003
Hexavalent Chromium, total	mg/L	0.001	-	<0.0005
Dissolved Metals				
Cadmium, dissolved (D-Cd)	mg/L	0.000042 [3]	0.000062 [3]	<0.000005
Copper, dissolved (D-Cu)	mg/L	0.00090 [3]	0.0053 [3]	0.00076
Iron, dissolved (D-Fe)	mg/L	-	0.35	0.011
Lead, dissolved (D-Pb)	mg/L	0.0045 [3]	-	<0.00005
Manganese, dissolved (D-Mn)	mg/L	0.32 [3]	1.97 [3]	0.00059
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.0152
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.0055 [3]	0.020 [3]	0.0026
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	mg/L	0.0058	-	-
Acridine	mg/L	0.003	-	-
Anthracene	mg/L	0.000012	-	-
Benz(a)anthracene	mg/L	0.000018	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-
Chrysene	mg/L	-	-	-
Fluoranthene	mg/L	0.00004	-	-
Fluorene	mg/L	0.003	-	-
1-methylnaphthalene	mg/L	-	-	-
2-methylnaphthalene	mg/L	-	-	-
Naphthalene	mg/L	0.001	0.001	-
Phenanthrene	mg/L	0.0003	-	-
Pyrene	mg/L	0.00002	-	-
Quinoline	mg/L	0.0034	-	-
Volatile Organic Compounds (VOCs)				
Benzene	mg/L	0.04	-	-
Ethylbenzene	mg/L	0.09	-	-
Methyl-tert-butyl-ether	mg/L	10	3.4	-
Styrene	mg/L	0.072	-	-
Toluene	mg/L	0.0005	-	-
Total Xylenes	mg/L	0.03	-	-
Chlorobenzene	mg/L	-	-	-
1,2-Dichlorobenzene	mg/L	-	-	-

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of freshwater aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of freshwater aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of freshwater aquatic life (BC ENV, 2023). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of freshwater aquatic life (CCME, 2021). Federal Water Quality Guidelines (FWQG) are used for total Al, Co, and V, and for dissolved Cu, Sr, and Pb (Environment and Climate Change Canada).
[3] BC WQG or CWQG indicated to be variable are calculated from sample-specific measurements for temperature, field pH, total hardness and dissolved organic carbon (DOC) content.
[4] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[5] The approved BC WQG for hexavalent chromium [Cr(VI)] is 0.001 mg/L and 0.0089 mg/L for trivalent chromium [Cr(III)]. The more conservative criteria for Cr(VI) is applied to total chromium results.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Appendix E: Freshwater Receiving Environment Results

Table E-1: Summary of Freshwater Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station SW-01 Lower Reach of Woodfibre Creek (near the mouth) SW-01 VA24B0452-001 2024-05-10 13:23	Station SW-02 Upper Reach of Mill Creek (upstream of the third bridge) SW-02 VA24B0330-001 2024-05-09 14:00	Station SW-04 Lower Reach of East Creek (near the outlet to the outfall culvert) SW-04 VA24B0452-002 2024-05-10 10:30	Station SW-07 Upstream Mill Creek (at the diversion inlet) SW-07 VA24B0330-003 2024-05-09 13:00
		Long Term	Short Term				
General Parameters							
pH - Field	pH units	6.5 - 9.0	-	7.3	6.7	7.3	6.6
Specific Conductivity - Field	µS/cm	-	-	30.4	14.0	64.9	20.6
Temperature - Field	℃	-	-	8.0	8.0	10.5	8.3
Salinity - Field	ppt	-	-	0.02	0.01	0.03	0.01
Turbidity - Field	NTU	-	-	0.57	0.41	0.47	0.76
TSS	mg/L	-	-	<3	<3	<3	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	14.66	14.46	12.88	14.35
Anions and Nutrients							
Sulphate	mg/L	128 [3]	-	0.35	1.38	2.77	1.4
Chloride	mg/L	120	600	<0.5	<0.5	0.56	<0.5
Fluoride	mg/L	-	0.40 - 0.78 [3]	<0.02	<0.02	<0.02	<0.02
Ammonia (N-NH_3)	mg/L	1.55 - 1.88 [3]	8.07 - 25.2 [3]	<0.005	<0.005	<0.005	<0.005
Nitrite (N-NO_2)	mg/L	0.02 [3]	0.06 [3]	<0.001	<0.001	<0.001	<0.001
Nitrate (N-NO_3)	mg/L	3	32.8	0.0135	0.0292	0.0784	0.0302
Total Metals							
Aluminum, total (T-Al)	mg/L	0.028 - 0.22 [3]	-	***0.153***	***0.0901***	0.0572	***0.0863***
Antimony, total (T-Sb)	mg/L	0.074	-	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic, total (T-As)	mg/L	0.005	-	<0.0001	<0.0001	0.0001	<0.0001
Barium, total (T-Ba)	mg/L	1	-	0.00133	0.0019	0.00555	0.00173
Beryllium, total (T-Be)	mg/L	0.00013	-	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	29	<0.01	<0.01	<0.01	<0.01
Cadmium, total (T-Cd)	mg/L	0.000036 - 0.000051 [3]	0.00011 - 0.00052 [3]	<0.000005	<0.000005	0.0000095	0.0000061
Chromium, total (T-Cr) [5]	mg/L	0.001	-	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	0.001	0.11	<0.0001	<0.0001	<0.0001	<0.0001
Copper, total (T-Cu)	mg/L	-	-	<0.0005	0.00055	0.00101	<0.0005
Iron, total (T-Fe)	mg/L	0.3	1	0.028	0.016	0.111	0.011
Lead, total (T-Pb)	mg/L	0.0034 - 0.0039 [3]	0.003 - 0.014 [3]	0.000058	<0.00005	0.000091	<0.00005
Manganese, total (T-Mn)	mg/L	0.77 [3]	0.82 [3]	0.00096	0.00060	0.0058	0.00042
Mercury, total (T-Hg)	mg/L	0.00002	-	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	0.073	46	0.000192	0.000358	0.000701	0.000337
Nickel, total (T-Ni)	mg/L	0.025 [3]	-	<0.0005	<0.0005	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.001	-	<0.00005	<0.00005	<0.00005	<0.00005
Silver, total (T-Ag)	mg/L	0.00005 [3]	0.0001 [3]	<0.00001	<0.00001	<0.00001	<0.00001
Thallium, total (T-Tl)	mg/L	0.0008	-	<0.00001	<0.00001	<0.00001	<0.00001
Uranium, total (T-U)	mg/L	0.0085	0.033	0.000593	0.000181	0.000085	0.00018
Vanadium, total (T-V)	mg/L	0.12	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc, total (T-Zn)	mg/L	-	-	<0.003	<0.003	<0.003	<0.003
Hexavalent Chromium, total	mg/L	0.001	-	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Metals							
Cadmium, dissolved (D-Cd)	mg/L	0.000018 - 0.000077 [3]	0.000038 - 0.00014 [3]	<0.000005	<0.000005	0.0000077	<0.000005
Copper, dissolved (D-Cu)	mg/L	0.0002 - 0.0009 [3]	0.0005 - 0.0053 [3]	0.00021	***0.00022***	***0.00071***	***0.00024***
Iron, dissolved (D-Fe)	mg/L	-	0.35	0.02	<0.01	0.036	<0.01
Lead, dissolved (D-Pb)	mg/L	0.0025 - 0.0045 [3]	-	<0.00005	<0.00005	<0.00005	<0.00005
Manganese, dissolved (D-Mn)	mg/L	0.32 - 0.38 [3]	1.97 - 2.01 [3]	0.00039	0.00034	0.00304	0.00025
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.00274	0.00428	0.031	0.00503
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.0054 - 0.011 [3]	0.016 - 0.028 [3]	<0.001	<0.001	0.0021	<0.001
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	mg/L	0.0058	-	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	0.003	-	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	0.000012	-	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	0.000018	-	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	<0.000005	<0.000005	<0.000005	<0.000005
Chrysene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Fluoranthene	mg/L	0.00004	-	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	mg/L	0.003	-	<0.00001	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	0.001	<0.00005	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	0.0003	-	<0.00002	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	0.00002	-	<0.00001	<0.00001	<0.00001	<0.00001
Quinoline	mg/L	0.0034	-	<0.00005	<0.00005	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)							
Benzene	mg/L	0.04	-	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	0.09	-	<0.0005	<0.0005	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	10	3.4	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/L	0.072	-	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/L	0.0005	-	<0.0004	<0.0004	<0.0004	<0.0004
Total Xylenes	mg/L	0.03	-	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of freshwater aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of freshwater aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of freshwater aquatic life (BC ENV, 2023). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of freshwater aquatic life (CCME, 2021). Federal Water Quality Guidelines (FWQG) are used for total Al, Co, and V, and for dissolved Cu, Sr, and Pb (Environment and Climate Change Canada).
[3] BC WQG or CWQG indicated to be variable are calculated from sample-specific measurements for temperature, field pH, total hardness and dissolved organic carbon (DOC) content.
[4] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.
[5] The approved BC WQG for hexavalent chromium [Cr(VI)] is 0.001 mg/L and 0.0089 mg/L for trivalent chromium [Cr(III)]. The more conservative criteria for Cr(VI) is applied to total chromium results.
The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Appendix F: Estuarine Receiving Environment Results

Table F-1: Summary of Mill Creek Estuary Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station SW-03
				Lower Reach of Mill Creek (near the mouth, in the estuarine zone)
				SW-03
				VA24B0330-002
		Long Term	Short Term	2024-05-09 14:45
General Parameters				
pH - Field	pH units	7.0 - 8.7	-	***6.8***
Specific Conductivity - Field	µS/cm	-	-	16.6
Temperature - Field	°C	-	-	8.8
Salinity - Field	ppt	-	-	0.01
Turbidity - Field	NTU	-	-	0.31
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	-	-	13.59
Anions and Nutrients				
Sulphate	mg/L	-	-	1.47
Chloride	mg/L	-	-	<0.5
Fluoride	mg/L	-	-	<0.02
Ammonia ($N\text{-}NH_3$)	mg/L	-	-	<0.005
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	<0.001
Nitrate ($N\text{-}NO_3$)	mg/L	-	-	0.0321
Total Metals				
Aluminum, total (T-Al)	mg/L	-	-	0.0839
Antimony, total (T-Sb)	mg/L	-	-	<0.0001
Arsenic, total (T-As)	mg/L	-	-	<0.0001
Barium, total (T-Ba)	mg/L	-	-	0.00184
Beryllium, total (T-Be)	mg/L	-	-	<0.0001
Boron, total (T-B)	mg/L	-	-	<0.01
Cadmium, total (T-Cd)	mg/L	-	-	0.0000054
Chromium, total (T-Cr)	mg/L	-	-	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	<0.0001
Copper, total (T-Cu)	mg/L	0.002	0.003	<0.0005
Iron, total (T-Fe)	mg/L	-	-	0.012
Lead, total (T-Pb)	mg/L	0.002	0.14	<0.00005
Manganese, total (T-Mn)	mg/L	-	-	0.00043
Mercury, total (T-Hg) [3]	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.000431
Nickel, total (T-Ni)	mg/L	-	-	<0.0005
Selenium, total (T-Se)	mg/L	-	-	<0.00005
Silver, total (T-Ag)	mg/L	0.0015	0.003	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	<0.00001
Uranium, total (T-U)	mg/L	-	-	0.000187
Vanadium, total (T-V)	mg/L	-	-	<0.0005
Zinc, total (T-Zn)	mg/L	-	-	<0.003
Hexavalent Chromium, total	mg/L	-	-	<0.0005
Dissolved Metals				
Cadmium, dissolved (D-Cd)	mg/L	-	-	<0.000005
Copper, dissolved (D-Cu)	mg/L	-	-	0.00024
Iron, dissolved (D-Fe)	mg/L	-	-	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	0.00025
Strontium, dissolved (D-Sr)	mg/L	-	-	0.00503
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005
Zinc, dissolved (D-Zn)	mg/L	-	-	<0.001
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	mg/L	-	-	<0.00001
Acridine	mg/L	-	-	<0.00001
Anthracene	mg/L	-	-	<0.00001
Benz(a)anthracene	mg/L	-	-	<0.00001
Benzo(a)pyrene	mg/L	-	-	<0.000005
Chrysene	mg/L	-	-	<0.00001
Fluoranthene	mg/L	-	-	<0.00001
Fluorene	mg/L	-	-	<0.00001
1-methylnaphthalene	mg/L	-	-	<0.00001
2-methylnaphthalene	mg/L	-	-	<0.00001
Naphthalene	mg/L	-	-	<0.00005
Phenanthrene	mg/L	-	-	<0.00002
Pyrene	mg/L	-	-	<0.00001
Quinoline	mg/L	-	-	<0.00005
Volatile Organic Compounds (VOCs)				
Benzene	mg/L	-	-	<0.0005
Ethylbenzene	mg/L	-	-	<0.0005
Methyl-tert-butyl-ether	mg/L	-	-	<0.0005
Styrene	mg/L	-	-	<0.0005
Toluene	mg/L	-	-	<0.0004
Total Xylenes	mg/L	-	-	<0.0005
Chlorobenzene	mg/L	-	-	<0.0005
1,2-Dichlorobenzene	mg/L	-	-	<0.0005

Notes:
Results in ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of estuarine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of estuarine water aquatic life.
[1] Approved British Columbia Water Quality Guidelines for the protection of estuarine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.
[2] Canadian Water Quality Guideline for the protection of estuarine aquatic life (CCME, 2021).
[3] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

Appendix G: Marine Water Receiving Environment Results

Table G-1: Summary of Marine Water Quality Results Received at the Time of Reporting

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station IDZ-E1			Station IDZ-E2		
				0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
				IDZ-E1-0.5	IDZ-E1-2m	IDZ-E1-SF	IDZ-E2-0.5	IDZ-E2-2m	IDZ-E2-SF
				VA24B0178-004	VA24B0178-005	VA24B0178-006	VA24B0178-007	VA24B0178-008	VA24B0178-009
		Long Term	Short Term	2024-05-08 11:45	2024-05-08 11:30	2024-05-08 11:15	2024-05-08 12:30	2024-05-08 13:00	2024-05-08 12:05
General Parameters									
pH - Field	pH units	7.0 - 8.7	-	8.41	8.50	8.04	8.52	8.64	7.84
Specific Conductivity - Field	µS/cm	-	-	9138	9445	30824	11567	15904	30983
Temperature - Field	℃	-	-	10.3	10.3	9.3	10.5	11.3	8.9
Salinity - Field	ppt	Narrative[3]	-	7.39	7.57	28.22	9.48	13.46	28.72
Turbidity - Field	NTU	Narrative[3]	Narrative[3]	1.53	1.60	0.0	1.38	1.03	0.0
TSS	mg/L	Narrative[3]	Narrative[3]	<2	3.3	<2	2.2	3.7	2.0
Dissolved Oxygen - Field	mg/L	>=8	-	11.69	12.03	8.71	11.62	12.04	***7.59***
Anions and Nutrients									
Sulphate	mg/L	-	-	654	596	2280	1060	1010	2400
Chloride	mg/L	-	-	5080	4690	16800	7900	7690	17600
Fluoride	mg/L	-	1.5	<1	<1	<1	<1	<1	<1
Ammonia ($N\text{-}NH_3$)	mg/L	Variable [4]	Variable [4]	<0.005	<0.005	0.0369	<0.005	<0.005	0.0264
Nitrite ($N\text{-}NO_2$)	mg/L	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate ($N\text{-}NO_3$)	mg/L	3.7	339	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Metals									
Aluminum, total (T-Al)	mg/L	-	-	0.124	0.122	0.0064	0.0822	0.0825	0.0065
Antimony, total (T-Sb)	mg/L	-	0.27 [5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic, total (T-As)	mg/L	0.0125	0.0125	0.00124	0.00134	0.00344	0.00174	0.00174	0.0034
Barium, total (T-Ba)	mg/L	-	-	0.0079	0.0077	0.0077	0.0078	0.0076	0.0076
Beryllium, total (T-Be)	mg/L	0.1	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron, total (T-B)	mg/L	1.2	-	1.18	1.09	***3.91***	***1.66***	***1.87***	***3.85***
Cadmium, total (T-Cd)	mg/L	0.00012	-	0.000023	0.000021	0.00008	0.000028	0.000035	0.00007
Chromium, total (T-Cr)	mg/L	-	-	<0.0005	0.00064	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	0.000118	0.000113	0.000092	0.000106	0.000112	0.000084
Copper, total (T-Cu)	mg/L	0.002	0.003	0.00101	0.00097	<0.0005	0.00084	0.00087	<0.0005
Iron, total (T-Fe)	mg/L	-	-	0.164	0.16	0.016	0.121	0.115	0.017
Lead, total (T-Pb)	mg/L	0.002	0.14	0.00030	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese, total (T-Mn)	mg/L	-	-	0.00872	0.00871	0.00136	0.0080	0.00701	0.00146
Mercury, total (T-Hg)	mg/L	0.000016	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.00275	0.00305	0.0103	0.00424	0.00483	0.00981
Nickel, total (T-Ni)	mg/L	0.0083	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	<0.0005	<0.0005	0.00099	<0.0005	<0.0005	0.00101
Silver, total (T-Ag)	mg/L	0.0015	0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium, total (T-Tl)	mg/L	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium, total (T-U)	mg/L	-	-	0.00069	0.000722	0.00253	0.00100	0.00131	0.00256
Vanadium, total (T-V)	mg/L	0.005 [7]	-	0.00096	0.00096	0.00146	0.00103	0.00107	0.00145
Zinc, total (T-Zn)	mg/L	0.01	0.055	0.0098	<0.003	<0.003	<0.003	<0.003	<0.003
Hexavalent Chromium, total	mg/L	0.0015	-	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dissolved Metals									
Cadmium, dissolved (D-Cd)	mg/L	-	-	0.000022	0.000022	0.000060	0.000020	0.000027	0.000039
Copper, dissolved (D-Cu)	mg/L	-	-	0.00063	0.00066	<0.0005	<0.0005	0.00078	<0.0005
Iron, dissolved (D-Fe)	mg/L	-	-	0.02	0.019	<0.01	0.014	<0.01	0.011
Lead, dissolved (D-Pb)	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese, dissolved (D-Mn)	mg/L	-	-	0.00636	0.00607	0.001	0.00567	0.00434	0.00121
Strontium, dissolved (D-Sr)	mg/L	-	-	1.53	1.72	6.42	2.46	3.08	6.55
Vanadium, dissolved (D-V)	mg/L	-	-	0.00055	0.00058	0.00129	0.00065	0.00076	0.00138
Zinc, dissolved (D-Zn)	mg/L	-	-	0.001	<0.001	<0.001	0.0012	<0.001	0.0012
Polycyclic Aromatic Hydrocarbons (PAHs)									
Acenaphthene	mg/L	0.006	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Chrysene	mg/L	0.0001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluoranthene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	mg/L	0.012	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	<0.00001	0.000010	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Quinoline	mg/L	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)									
Benzene	mg/L	0.11	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	0.25	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	5	0.44	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/L	0.215	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Total Xylenes	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	mg/L	0.025	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	0.042	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Notes:

Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.

Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.

[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.

[2] Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

[3] Narrative guideline for the evaluation of change from background conditions arising from discharges to the aquatic environment. The water quality data presented in the table were collected when the site was discharging, therefore the guidelines were evaluated.

[4] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).

[5] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.

[6] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

[7] Federal Water Quality Guideline for Vanadium (Environment and Climate Change Canada).

The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.

Table G-2: Summary of Marine Water Quality Results Received at the Time of Reporting

Parameter	Unit	Lowest Applicable Guideline [1, 2]		Station WQR1			Station WQR2		
				0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
				WQR1-0.5	WQR1-2m	WQR1-SF	WQR2-0.5	WQR2-2m	WQR2-SF
				VA24B0178-010	VA24B0178-011	VA24B0178-012	VA24B0178-001	VA24B0178-002	VA24B0178-003
		Long Term	Short Term	2024-05-08 14:30	2024-05-08 14:15	2024-05-08 13:45	2024-05-08 10:45	2024-05-08 10:30	2024-05-08 9:15
General Parameters									
pH - Field	pH units	7.0 - 8.7	-	8.64	8.68	7.81	8.28	8.43	8.00
Specific Conductivity - Field	µS/cm	-	-	13981	16667	31594	7627	7622	30851
Temperature - Field	℃	-	-	11.8	11.6	8.6	10.0	10.2	9.2
Salinity - Field	ppt	Narrative[3]	-	11.17	13.50	29.95	6.06	6.31	28.28
Turbidity - Field	NTU	Narrative[3]	Narrative[3]	1.17	1.03	0.01	1.50	1.50	0.0
TSS	mg/L	Narrative[3]	Narrative[3]	3.7	3.3	2.8	2.4	2.1	<2
Dissolved Oxygen - Field	mg/L	>=8	-	11.63	11.77	***6.27***	11.71	12.32	8.47
Anions and Nutrients									
Sulphate	mg/L	-	-	946	1090	2460	471	498	2370
Chloride	mg/L	-	-	7170	8090	17900	3720	3770	17200
Fluoride	mg/L	-	1.5	<1	<1	<1	<1	<1	<1
Ammonia (N-NH_3)	mg/L	Variable [4]	Variable [4]	<0.005	<0.005	<0.005	<0.005	<0.005	0.0348
Nitrite (N-NO_2)	mg/L	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N-NO_3)	mg/L	3.7	339	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Metals									
Aluminum, total (T-Al)	mg/L	-	-	0.0782	0.0737	0.0054	0.14	0.12	0.0066
Antimony, total (T-Sb)	mg/L	-	0.27 [5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic, total (T-As)	mg/L	0.0125	0.0125	0.00174	0.00172	0.00351	0.00089	0.00101	0.00324
Barium, total (T-Ba)	mg/L	-	-	0.0074	0.0075	0.01	0.008	0.0081	0.0102
Beryllium, total (T-Be)	mg/L	0.1	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron, total (T-B)	mg/L	1.2	-	***1.66***	***1.89***	***3.85***	0.78	0.90	***3.89***
Cadmium, total (T-Cd)	mg/L	0.00012	-	0.000025	0.000028	0.000091	0.000021	<0.00002	0.000078
Chromium, total (T-Cr)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	0.000108	0.000102	0.000084	0.000123	0.000116	0.000086
Copper, total (T-Cu)	mg/L	0.002	0.003	0.0008	0.00074	<0.0005	0.00094	0.00098	<0.0005
Iron, total (T-Fe)	mg/L	-	-	0.113	0.098	<0.01	0.162	0.161	<0.01
Lead, total (T-Pb)	mg/L	0.002	0.14	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese, total (T-Mn)	mg/L	-	-	0.0068	0.00618	0.00123	0.00878	0.00849	0.00098
Mercury, total (T-Hg)	mg/L	0.000016	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.00418	0.00458	0.00986	0.00248	0.00227	0.0105
Nickel, total (T-Ni)	mg/L	0.0083	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	<0.0005	<0.0005	0.00103	<0.0005	<0.0005	0.00075
Silver, total (T-Ag)	mg/L	0.0015	0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thallium, total (T-Tl)	mg/L	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Uranium, total (T-U)	mg/L	-	-	0.00107	0.00122	0.00263	0.000653	0.000567	0.00268
Vanadium, total (T-V)	mg/L	0.005 [7]	-	0.001	0.00102	0.00144	0.00094	0.00088	0.00157
Zinc, total (T-Zn)	mg/L	0.01	0.055	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Hexavalent Chromium, total	mg/L	0.0015	-	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dissolved Metals									
Cadmium, dissolved (D-Cd)	mg/L	-	-	0.000026	0.000025	0.000083	<0.00002	0.000021	0.000071
Copper, dissolved (D-Cu)	mg/L	-	-	0.0007	0.00061	0.00083	0.00062	0.0007	0.00052
Iron, dissolved (D-Fe)	mg/L	-	-	<0.01	<0.01	<0.01	0.022	0.019	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese, dissolved (D-Mn)	mg/L	-	-	0.00487	0.0048	0.00064	0.00617	0.00602	0.00063
Strontium, dissolved (D-Sr)	mg/L	-	-	2.62	2.6	6.85	1.42	1.36	6.62
Vanadium, dissolved (D-V)	mg/L	-	-	0.00067	0.00069	0.00134	0.00054	<0.0005	0.00134
Zinc, dissolved (D-Zn)	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polycyclic Aromatic Hydrocarbons (PAHs)									
Acenaphthene	mg/L	0.006	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Chrysene	mg/L	0.0001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluoranthene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	mg/L	0.012	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Quinoline	mg/L	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Volatile Organic Compounds (VOCs)									
Benzene	mg/L	0.11	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/L	0.25	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl-tert-butyl-ether	mg/L	5	0.44	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/L	0.215	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Total Xylenes	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Chlorobenzene	mg/L	0.025	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichlorobenzene	mg/L	0.042	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Notes:

Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.

Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.

[1] Approved British Columbia Water Quality Guidelines for the protection of marine aquatic life (BC ENV, 2021). Where an approved guideline is not established, the working guideline is applied.

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[3] Narrative guideline for the evaluation of change from background conditions arising from discharges to the aquatic environment. The water quality data presented in the table were collected when the site was discharging, therefore the guidelines were evaluated.

[4] The approved total ammonia nitrogen BC WQG is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document (BC ENV, 2021).

[5] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.

[6] When MeHg ⩽ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

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The lowest applicable guidelines are shown in the table; however, water quality data was screened to all applicable guidelines.