

TECHNICAL MEMORANDUM

To: Ashleigh Crompton, Mike Champion, Jackie Boruch, Ryan Schucroft, Jamie Maxwell (Woodfibre LNG) **Date:** 3 June 2024

From: Holly Pelletier and Patrick Mueller (Lorax) **Project #:** A633-7

Subject: PE-111578 Weekly Discharge and Compliance Report #15 for May 19 – May 25

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 #15) was prepared by Lorax Environmental and summarizes monitoring conducted the week of May 19 – May 25 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 #15 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 19 – May 25 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 19 – May 25). Contaminated and potentially contaminated contact waters from excavations within the East and West Catchments were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond. A total of 2,889 m³ of treated WWTP effluent was discharged to the East Sedimentation Pond during the reporting period (May 19 – May 25). Daily WWTP effluent flows are provided in Appendix C (Table C-2).

During the monitoring period (May 19 – May 25), the East Sedimentation Pond received treated WWTP effluent each day, and non-contaminated contact waters from the West Catchment on May 19 and 20. Water was not directed to the West Sedimentation Pond. There were no discharges from either pond during the monitoring period except from the East Sedimentation Pond on May 23 and 24 when a total of 940 m³ was discharged to Howe Sound. Daily sedimentation pond effluent flows are provided in Appendix B (Table B-4). Aerial views of the ponds on May 25 are shown in Figure 2 and Figure 3.

2. Monitoring Summary

The PE-111578 authorized works were under construction during the May 19 – May 25 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).

East Sedimentation Pond influent and effluent stations SP-E-NW and SP-E-NE, respectively, are in-pond stations that may be monitored in place of stations SP-E-IN-2 and SP-E-OUT when there is no influent to, or discharge from the East Sedimentation Pond.

Stations SW-01, SW-02, SW-03, SW-04, SW-07, OUT-01, IDZ-E1, IDZ-E2, WQR1, WQR2, WWTP-E-IN, WWTP-E-OUT, SP-E-NE and SP-E-NW were monitored during the monitoring period (May 19 – May 25). Sampling dates and parameters tested are summarized in Table 1.

Table 1: Summary of PE-111578 monitoring samples collected May 19 – May 25.

Sampling Date	Sample	Description	Parameters Tested	Monitoring Frequency
May 19, 2024	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
	WWTP-E-OUT	East WWTP effluent		
May 20, 2024	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
	SP-E-NW ²	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-IN	East WWTP influent		
May 21, 2024	WWTP-E-OUT	East WWTP effluent	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality		
	SP-E-NW ²	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-IN	East WWTP influent		
May 22, 2024	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, and Methyl Mercury.	W ₃
	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
	WWTP-E-IN	East WWTP influent		
WWTP-E-OUT	East WWTP effluent			
May 23, 2024	OUT-01	Non-Contact Water Diversion Ditch Outlet	Field, Physical & General Parameters, Total and Dissolved Metals, Glycols, Oil and Grease, and Methyl Mercury.	W ₃
	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.	W ₃
	SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)		
	SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
	SW-07	Upstream Mill Creek (at the diversion inlet)		
	SP-E-OUT	East Sedimentation Pond effluent (compliance point)		
	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality		
	WWTP-E-IN	East WWTP influent		
WWTP-E-OUT	East WWTP effluent			
May 24, 2024	IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, and Methyl Mercury.	W ₃
	IDZ-E1-2m	Howe Sound IDZ station E1; 2 m below surface		
	IDZ-E1-SF	Howe Sound IDZ station E1; 2 m above the seafloor		
	IDZ-E2-0.5	Howe Sound IDZ station E2; 0.5 m below surface		
	IDZ-E2-2m	Howe Sound IDZ station E2; 2 m below surface		
	IDZ-E2-SF	Howe Sound IDZ station E2; 2 m above the seafloor		
	WQR1-0.5	Reference site 1; 0.5 m below surface.		
	WQR1-2m	Reference site 1; 2 m below surface.		
	WQR1-SF	Reference site 1; 2 m above the seafloor.		
	WQR2-0.5	Reference site 2; 0.5 m below surface.		
	WQR2-2m	Reference site 2; 2 m below surface.		
	WQR2-SF	Reference site 2; 2 m above the seafloor.		
	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality		
	WWTP-E-IN	East WWTP influent		
WWTP-E-OUT	East WWTP effluent			
May 25, 2024	SP-E-NE ¹	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters, Total and Dissolved Metals.	D, P
	WWTP-E-IN	East WWTP influent	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		

Notes:

Monitoring frequency requirements under PE-111578 are indicated as follows:

D – daily monitoring of field parameters at WWTP and sedimentation pond influent and effluent stations.

M – Monthly monitoring for all parameters at WWTP, sedimentation pond and receiving environment stations.

W₁ – initial high frequency monitoring for physical parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 6 months of monitoring).W₂ – initial high frequency monitoring for all parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 5 weeks of monitoring)W₃ – spring and fall high frequency sampling for all parameters receiving environment stations (5 samples collected over a 30 day period).

P - periodic monitoring for targeted parameters that is supplementary to PE-111578 requirements.

¹ In-Pond station SP-E-NE of the East Sedimentation Pond is monitored in place of station SP-E-OUT when there is no discharge from the East Sedimentation Pond.

3. Water Quality Results

3.1 Overview

Field measurements and analytical results for the monitoring period (May 19 – May 25) 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-01 collected May 22 (only field results available)
- SW-02, SW-03, SW-04, and SW-07 collected May 23 (only field results available)
- OUT-01 collected May 23 (only field results available)
- IDZ-E1, IDZ-E2, WQR1, and WQR2 collected May 24 (only field results available)

Dioxin and furan analytical results for samples collected April 28 – 30 and described in Weekly Report #12 were available at the time of reporting (Table 2). Federal and Provincial Water Quality Guidelines (WQG) are not specified for dioxins and furans. The general term “dioxins and furans” refers to a grouping of hundreds of individual compounds with similar chemical composition and properties. To simplify result presentation and interpretation, the results of individual compounds are converted to a total toxic equivalent (TEQ) value and are summed to produce a single TEQ value for each sample. Consistent with the pre-construction monitoring program, a lower-bound TEQ value is reported. The lower-bound TEQ is calculated assuming a concentration of zero for results reported as not detected, therefore, if individual compounds are not detected the TEQ will equal zero.

Analytical results for samples collected May 14 – 16 and described in Report #14 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:

- SW-02, SW-03, and SW-07 collected on May 14 (methyl mercury, dioxins and furans)
- OUT-02 collected May 16 (methyl mercury only)
- SW-01 and SW-04 collected on May 16 (methyl mercury, dioxins and furans)

Table 2: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #15.

Sample	Description	Sampling Date	Parameters Reported		
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	April 28, 2024	Dioxins and Furans		
SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)				
SW-07	Upstream Mill Creek (at the diversion inlet)				
SW-01	Lower Reach of Woodfibre Creek (near the mouth)	April 29, 2024	Dioxins and Furans		
SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)				
SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)				
SP-E-IN-2	Influent pipe southwest of the East Sedimentation Pond	April 30, 2024	Dioxins and Furans		
IDZ-E1-0.5	IDZ monitoring station 20-30 m southeast of East Sedimentation Pond discharge (SP-E-Out); 0.5 m below surface				
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.				
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)			May 14, 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)				
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	May 15, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, and PAHs.		
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 and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.		
WWTP-E-OUT	Effluent from the East WWTP discharged to the East Sedimentation Pond				
OUT-02	Non-Contact Water Diversion Ditch Outlet	May 16, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.		
SW-01	Lower Reach of Woodfibre Creek (near the mouth)				
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	May 20, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.		
SP-E-NW	NW corner of East Sedimentation Pond proximal to the outflow of the influent pump				
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 21, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.		
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump				
SP-E-NW	NW corner of East Sedimentation Pond proximal to the outflow of the influent pump				
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 22, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.		
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump				
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 23, 2024	Field, Physical and General Parameters, Total, Dissolved Metals, Hexavalent Chromium, VOCs, and PAHs.		
SP-E-OUT	Discharge from the East Sedimentation Pond to Howe Sound (compliance point)				
SP-E-NE	NE corner of East Sedimentation Pond proximal to the intake of the discharge pump	May 25, 2024	Field Parameters, Total and Dissolved Metals.		

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, Table B-2, and Table B-3 (analytical results) and Table B-4 (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. The sedimentation pond was not receiving non-contaminated contact water influent at the time of monitoring each day during the monitoring period (May 19 – May 25), therefore measurements at station SP-E-IN-2 were not collected. Non-contaminated contact water was intermittently directed to the pond only on May 19 and 20. Two influent samples were collected (May 20 and 21) at in-pond station SP-E-NW (proximal to SP-E-IN-2 culvert outlet) and are considered representative of influent directed to the pond May 19 and 20.

The in-pond effluent samples (station SP-E-NE) collected May 15, 20, 21, 22, and 25 proximal to the effluent intake (Figure 1) were tested for total and dissolved metals, hexavalent chromium, and PAHs (except May 25) and met PE-111578 discharge limits for the tested parameters. The in-pond samples met WQGs for parameters without discharge limits except dissolved oxygen (7.62 mg/L) which was slightly below the lower limit of the WQG (8 mg/L) on May 15 and benzo(a)pyrene which was detected at a concentration of 0.0000179 mg/L on May 15, 1.8 times above the WQG value of 0.00001 mg/L. However, the pond did not discharge on May 15.

The East Sedimentation Pond intermittently discharged a total of 940 m³ during the monitoring period (May 19 – May 25) on May 23 and 24. Field measurements and analytical results for the East Sedimentation Pond effluent sample (station SP-E-OUT) collected on May 23 met PE-111578 discharge limits and were within WQGs.

Dioxins and furans analytical results were available at the time of reporting for the April 29 samples discussed in Weekly Report #12 for the East Sedimentation Pond influent (SP-E-IN) and discharge point (SP-E-OUT). The lower bound polychlorinated dibenzodioxins/dibenzofurans (PCDD/F; dioxins and furans) toxic equivalency (TEQ) was 26.9 pg/L in the influent sample and 0.505 pg/L in the effluent sample (SP-E-OUT) collected April 29.

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 19 – May 25). 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 20, 21, and 22 and were measured for general parameters, total and dissolved metals, hexavalent chromium, and PAHs. Analytical results for samples collected from the influent and effluent stations on May 15 and described in Report #14 were available at the time of reporting.

During the monitoring period, East WWTP effluent (WWTP-E-OUT) water quality ranged from pH 7.7 to 9.2, turbidity ranged 0 to 2.87 NTU and dissolved oxygen ranged from 8.42 to 12.7 mg/L (Appendix C, Table C-2). The effluent field measurements met the MDOs, except pH on May 23 and May 25 (pH 9.2 and 9.0, 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 15, 20, 21, and 22 East WWTP effluent sample (WWTP-E-OUT) met MDOs, except for total vanadium and total zinc. The total vanadium concentrations in the effluent samples ranged from 1 to 1.2 times the MDO value (0.005 mg/L) and are attributed to the soluble forms of the metal. The total zinc concentration in the sample collected from the East WWTP effluent on May 21 was 1.1 times greater than the MDO (0.01 mg/L). Total zinc concentrations are only partially attributed to the dissolved fraction. Process adjustments are underway as part of the East WWTP pilot trials to improve vanadium and zinc removal.

**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	2	Field pH was 0.50 and 0.30 s.u. above the upper MDO for pH in the field measurement collected from WWTP-E-OUT on May 23 (pH 9.2) and May 25 (pH 9.0), respectively. 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	4	4	The total vanadium concentrations were 1 to 1.2 times greater than the MDO in the samples from WWTP-E-OUT collected on May 15 (0.00613 mg/L), May 20 (0.00610 mg/L), May 21 (0.00616 mg/L), and May 22 (0.00516 mg/L). Process adjustments are underway as part of the WWTP pilot trials to improve vanadium removal.
Total Zinc	mg/L	0.01	4	1	The total zinc concentration in the sample from WWTP-E-OUT collected on May 21 (0.0108 mg/L) was 1.1 times greater than the MDO. Process adjustments are underway as part of the WWTP pilot trials to improve zinc 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 16 non-contact water diversion ditch outlet sample (OUT-02) described in Weekly Report #14 were available at the time of reporting and met WQGs except for total aluminum and dissolved copper. 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.

Analytical results for May 23 non-contact water monitoring (Table 1) were not available at the time of reporting. Field measurements will be reported when the corresponding analytical results are available.

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 for freshwater and estuarine water, respectively.

Analytical results were available for the May 14 and 16 samples discussed in Weekly Report #14 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 22 and 23 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 total aluminum (stations SW-02 and SW-07) and at Woodfibre and East Creek stations, except total aluminum at Woodfibre Creek station SW-01 and dissolved copper at East Creek station SW-04 (Appendix E). 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.

Dioxins and furans analytical results were available at the time of reporting for the April 28 and 29 samples discussed in Weekly Report #12 for freshwater and estuarine water receiving environment stations. The lower bound PCDD/F TEQ ranged from 0 to 0.093 pg/L in freshwater samples from Woodfibre Creek (SW-01), Mill Creek (SW-02 and SW-07), and East Creek (SW-04). The lower bound PCDD/F TEQ in the lower reach of Mill Creek (SW-03) was 0.0018 pg/L. The reported concentrations of dioxins and furans compounds observed in the freshwater and estuarine water samples are within the concentration ranges observed in the pre-construction baseline monitoring program.

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).

Dioxins and furans analytical results were available at the time of reporting for the April 30 samples discussed in Weekly Report #12 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. Analytical results for May 24 marine water monitoring (Table 1) were not available at the time of reporting. Field measurements will be reported when the corresponding analytical results are available.

The lower bound PCDD/F TEQ concentration ranged from 0.000528 to 0.0266 pg/L at station IDZ-E1, 0.0158 to 0.0258 pg/L at station IDZ-E2, 0 to 0.941 pg/L at reference station WQR1 and ranged from 0.0518 to 0.105 pg/L at reference station WQR2. The reported concentrations of dioxins and furans compounds observed in the marine water samples are within the concentration

ranges observed in the pre-construction baseline monitoring program, except the reported concentration at reference station WQR1 at 0.5 m below surface (0.941 pg/L). The reference station results suggest there may be more natural variability in dioxin and furan concentrations at the 0.5 m depth, compared to the 2 m depth and 2 m above seafloor samples that were collected during the baseline program (baseline data for the 0.5 depth are not available).

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, confirmation of recordkeeping, 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 19 – May 25, Report #15)		
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.
Recordkeeping Evaluation	Confirmation of the completeness of the daily recordkeeping specified in PE-111578 Conditions 2.1.3, 2.1.4, 2.2.3 and 2.2.4 is not included QC evaluation procedures.	Daily records are maintained by on-site Environmental Monitors and are used for the preparation of the weekly report. A record-keeping evaluation will be added to the QC procedure. Weekly spot-checks will be conducted beginning with the next weekly report to evaluate the completeness of the records. This item remains open until this QC evaluation is confirmed to be implemented.
Pending Data	Analytical results for samples collected May 22 – 24 were not reported.	Analytical results were not available at the time of preparing Report #15 and are expected to be available for the next reporting period. 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 and May 17 (SP-E-IN-2). PAHs were detected in the influent sample, and this is attributed to elevated TSS in the samples (192 and 20 mg/L, respectively). Note the concurrent April 29 and May 17 East Sedimentation Pond effluent samples met WQGs for PAHs. Additional influent monitoring was conducted May 20 and 21 (SP-E-IN-2). PAHs were detected in the influent sample collected May 21, and this is attributed to elevated TSS in the sample (32 mg/L). Further investigation of the potential source is ongoing. Note the concurrent May 21 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.	Available analytical results are discussed in Sections 3.2 through 3.6 of Report #12 and available dioxin and furan results are discussed in Section 3.2 through 3.6 of Report #15. Methyl mercury 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 early June. This item remains open pending the methyl mercury results.
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 conducted May 20 – 25 show effluent turbidity < 4 NTU indicating the removal of sediments and revised procedures for preventing sediment re-suspension have been effective. This item is closed.
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. The East Pond waters were temporarily relocated to the West Pond and then processed through the East WWTP. The East Pond was then refilled with East WWTP treated effluent. Follow-up monitoring conducted May 20 – 25 show dissolved vanadium and hexavalent chromium have been reduced to below the discharge limit / WQG indicating the treatment reduced vanadium and hexavalent chromium concentrations, and that revised procedures for managing the concentrations of these parameters in discharged effluent have been effective. This item is closed.
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. 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.
Report #14: Pending Data	Methyl mercury, dioxin and furan results for samples collected May 14 - 16 were not reported.	Available analytical results are discussed in Sections 3.2 through 3.6 of Report #15. 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.

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.

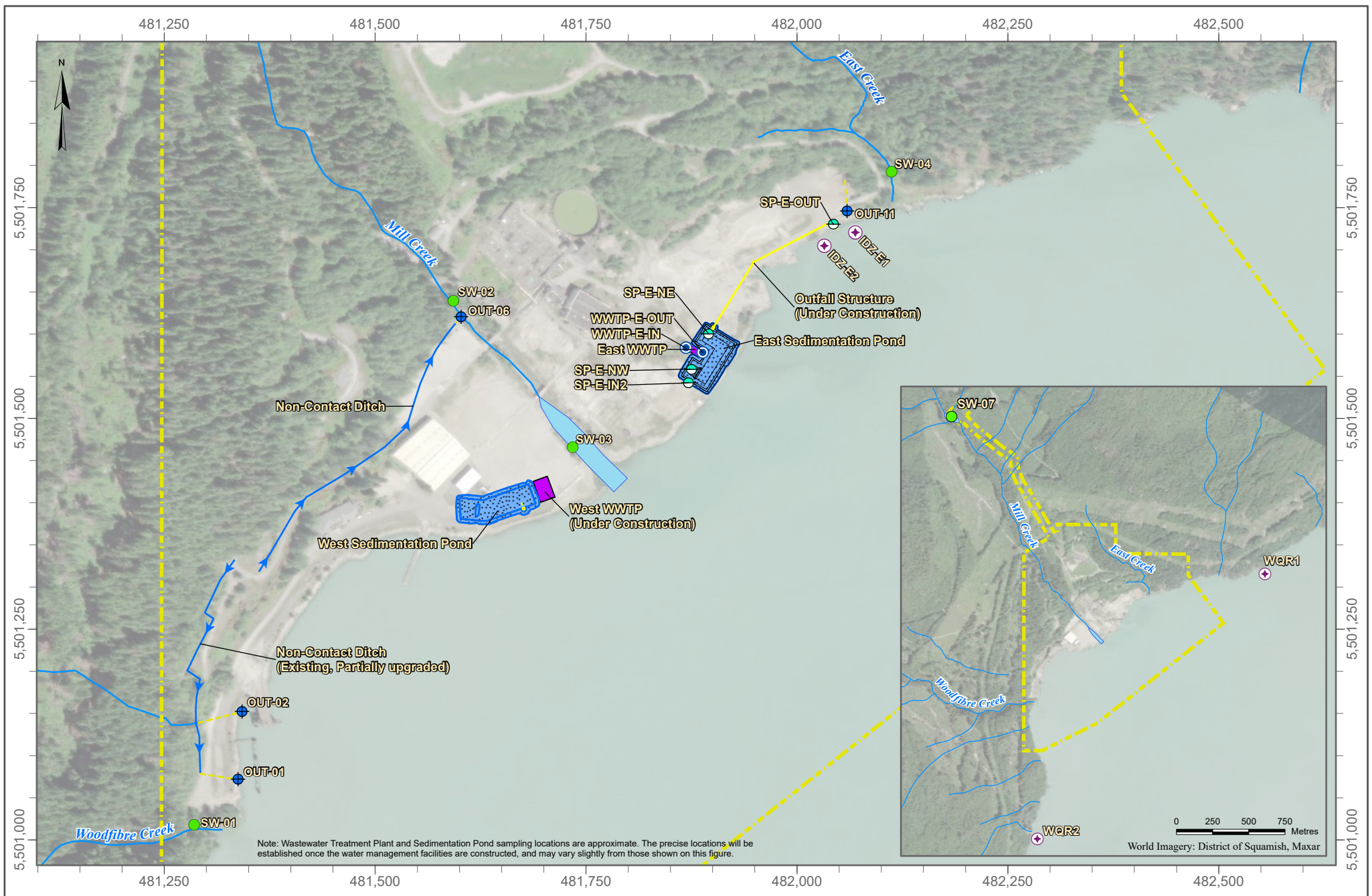


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Environmental Chemist





Note: Wastewater Treatment Plant and Sedimentation Pond sampling locations are approximate. The precise locations will be established once the water management facilities are constructed, and may vary slightly from those shown on this figure.

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 31, 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:

PROJECT:

Woodfibre LNG Project Construction Phase

TITLE:
Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (May 25, 2024)

PROJECT #: A633-7

FIGURE: 1

Appendix A: East and West Catchment Photographs



Figure 2. Aerial view of the East WWTP and East Sedimentation Pond (May 25, 2024).



Figure 3: Aerial view of the West Sedimentation Pond and West WWTP (located west of pond) on May 25, 2024.

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					
					In-Pond at Effluent Location	In-Pond at Influent Location	In-Pond at Effluent Location	In-Pond at Influent Location		
					SP-E-NE	SP-E-NW	SP-E-NE	SP-E-NW		
					VA24B0872-003	VA24B1233-004	VA24B1233-003	VA24B1327-004		
		Long Term	Short Term							
General Parameters										
pH - Field	pH units	- ⁶	-	5.5 - 9.0	8.0	8.3	8.10	8.2		
Specific Conductivity - Field	µS/cm	-	-	-	3355	2733	2662	2521		
Temperature - Field	°C	-	-	-	20.7	17.6	16.7	18.2		
Salinity - Field	ppt	-	-	-	1.93	1.57	1.66	1.51		
Turbidity - Field	NTU	-	-	-	149	3.39	3.31	47.11		
TSS	mg/L	- ⁶	-	25	16.7	<3	<3	32.3		
Dissolved Oxygen - Field	mg/L	>=8	-	-	<u>7.62</u>	10.68	9.89	9.05		
Anions and Nutrients										
Sulphate	mg/L	-	-	-	-	-	-	-		
Chloride	mg/L	-	-	-	-	-	-	-		
Fluoride	mg/L	-	1.5	-	-	-	-	-		
Ammonia (N-NH ₃)	mg/L	Variable ³	Variable ³	-	-	-	-	-		
Nitrite (N-NO ₂)	mg/L	-	-	-	-	-	-	-		
Nitrate (N-NO ₃)	mg/L	3.7	339	-	-	-	-	-		
Total Metals										
Aluminum, total (T-Al)	mg/L	-	-	-	0.297	0.137	0.0805	2.04		
Antimony, total (T-Sb)	mg/L	-	0.27 ⁴	-	0.00236	0.00243	0.00241	0.00241		
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00303	0.00286	0.00264	0.00317		
Barium, total (T-Ba)	mg/L	-	-	-	0.0275	0.0273	0.0254	0.039		
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0002	<0.0001	<0.0001	<0.0001		
Boron, total (T-B)	mg/L	1.2	-	-	0.164	0.134	0.144	0.156		
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.00002	<0.000015	<0.00002	0.0000842		
Chromium, total (T-Cr)	mg/L	-	-	-	0.00181	0.00129	0.00124	0.00291		
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0002	<0.0002	<0.0002	0.00066		
Copper, total (T-Cu)	mg/L	- ⁶	- ⁶	0.0043	0.00146	0.00114	<0.001	0.0044		
Iron, total (T-Fe)	mg/L	-	-	-	0.178	0.074	0.026	1.43		
Lead, total (T-Pb)	mg/L	- ⁶	- ⁶	0.0035	0.000556	0.000248	<0.0001	0.00458		
Manganese, total (T-Mn)	mg/L	-	-	-	0.00864	0.0041	0.00171	0.0421		
Mercury, total (T-Hg) ⁵	mg/L	0.000016	-	-	<0.000005	<0.000005	<0.000005	0.0000114		
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0391	0.0351	0.0342	0.0331		
Nickel, total (T-Ni)	mg/L	0.0083	-	-	0.00137	0.00139	0.00166	0.0023		
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000203	0.000164	0.000152	0.000162		
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00002	<0.00002	<0.00002	<0.00002		
Thallium, total (T-Tl)	mg/L	-	-	-	<0.00002	<0.00002	<0.00002	<0.00002		
Uranium, total (T-U)	mg/L	-	-	-	0.0291	0.022	0.0208	0.0200		
Vanadium, total (T-V)	mg/L	- ⁶	-	0.0081	0.00786	0.00713	0.00647	0.0100		
Zinc, total (T-Zn)	mg/L	- ⁶	- ⁶	0.0133	0.0062	0.0062	<0.006	0.0199		
Hexavalent Chromium, total	mg/L	0.0015	-	-	0.00105	0.00078	0.0007	0.00075		
Dissolved Metals										
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.000025	<0.000015	<0.000015	<0.000025		
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00099	0.00088	0.0007	0.00126		
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.02	<0.02	<0.02	<0.04		
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.0001	<0.0001	<0.0001	0.000166		
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00337	0.00158	0.00119	0.00591		
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.532	0.524	0.528	0.483		
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00722	0.00652	0.006	0.00613		
Zinc, dissolved (D-Zn)	mg/L	-	-	-	<0.002	0.0042	0.0032	0.0020		
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		
Benzo(a)anthracene	mg/L	-	-	-	0.000012	<0.00001	<0.00001	<0.000015		
Benzo(a)pyrene	mg/L	0.00001	-	-	<u>0.0000179</u>	<0.000005	<0.000005	<u>0.0000129</u>		
Chrysene	mg/L	0.0001	-	-	<0.00002	<0.00001	<0.00001	0.000025		
Fluoranthene	mg/L	-	-	-	0.000034	<0.00001	<0.00001	0.000061		
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	-	-	-	0.000020	<0.00002	<0.00002	0.000034		
Pyrene	mg/L	-	-	-	0.000032	<0.00001	<0.00001	0.000042		
Quinoline	mg/L	-	-	-	<0.00005	<0.00005	<0.00005	<0.00005		
Volatile Organic Compounds (VOCs)										
Benzene	mg/L	0.11	-	-	-	-	-	-		
Ethylbenzene	mg/L	0.25	-	-	-	-	-	-		
Methyl-tert-butyl-ether	mg/L	5	0.44	-	-	-	-	-		
Styrene	mg/L	-	-	-	-	-	-	-		
Toluene	mg/L	0.215	-	-	-	-	-	-		
Total Xylenes	mg/L	-	-	-	-	-	-	-		
Chlorobenzene	mg/L	0.025	-	-	-	-	-	-		
1,2-Dichlorobenzene	mg/L	0.042	-	-	-	-	-	-		

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 PE11578 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 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			
					In-Pond at Effluent Location	In-Pond at Effluent Location	Effluent	In-Pond at Effluent Location
					SP-E-NE	SP-E-NE	SP-E-OUT	SP-E-NE
					VA24B1327-003 2024-05-21 13:35	VA24B1623-003 2024-05-22 15:05	VA24B1636-004 2024-05-23 14:50	VA24B1827-001 2024-05-25 8:55
		Long Term	Short Term					
General Parameters								
pH - Field	pH units	- ⁶	-	5.5 - 9.0	8.1	8.3	8.9	9.00
Specific Conductivity - Field	µS/cm	-	-	-	2700	1626	1761	1872
Temperature - Field	°C	-	-	-	17.4	17.6	17.3	16.8
Salinity - Field	ppt	-	-	-	1.66	0.97	1.06	1.14
Turbidity - Field	NTU	-	-	-	3.62	1.73	1.47	0.47
TSS	mg/L	- ⁶	-	25	<3	<3	<3	-
Dissolved Oxygen - Field	mg/L	>=8	-	-	10.62	12.73	9.78	8.61
Anions and Nutrients								
Sulphate	mg/L	-	-	-	-	-	87.3	-
Chloride	mg/L	-	-	-	-	1.3	564	-
Fluoride	mg/L	-	1.5	-	-	-	<0.4	-
Ammonia (N-NH ₃)	mg/L	Variable ³	Variable ³	-	-	-	<0.005	-
Nitrite (N-NO ₂)	mg/L	-	-	-	-	-	<0.02	-
Nitrate (N-NO ₃)	mg/L	3.7	339	-	-	-	<0.1	-
Total Metals								
Aluminum, total (T-Al)	mg/L	-	-	-	0.0792	0.151	0.159	0.125
Antimony, total (T-Sb)	mg/L	-	0.27 ⁴	-	0.00228	0.00211	0.0021	0.0019
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00276	0.0026	0.00264	0.00267
Barium, total (T-Ba)	mg/L	-	-	-	0.0251	0.0159	0.0149	0.0166
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.15	0.112	0.092	0.123
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.000015	<0.000015	<0.000015	<0.00002
Chromium, total (T-Cr)	mg/L	-	-	-	0.00108	0.00116	0.00115	0.00105
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0002	<0.0001	<0.0001	<0.0001
Copper, total (T-Cu)	mg/L	- ⁶	- ⁶	0.0043	<0.001	0.00114	0.00194	0.00123
Iron, total (T-Fe)	mg/L	-	-	-	<0.02	0.085	0.062	0.074
Lead, total (T-Pb)	mg/L	- ⁶	- ⁶	0.0035	<0.0001	0.00036	0.000437	0.000404
Manganese, total (T-Mn)	mg/L	-	-	-	0.00099	0.00252	0.00204	0.00191
Mercury, total (T-Hg) ⁵	mg/L	0.000016	-	-	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0354	0.0292	0.0282	0.0513
Nickel, total (T-Ni)	mg/L	0.0083	-	-	0.00172	0.00158	0.0013	0.00129
Selenium, total (T-Se)	mg/L	0.002	-	-	<0.0001	0.00013	0.00014	0.000188
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00002	<0.00001	<0.00001	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	-	<0.00002	<0.00001	<0.00001	<0.00001
Uranium, total (T-U)	mg/L	-	-	-	0.0207	0.0175	0.0172	0.0436
Vanadium, total (T-V)	mg/L	- ⁶	-	0.0081	0.00624	0.00566	0.00610	0.00692
Zinc, total (T-Zn)	mg/L	- ⁶	- ⁶	0.0133	<0.006	0.0038	0.0112	0.0060
Hexavalent Chromium, total	mg/L	0.0015	-	-	0.00053	0.00058	0.00090	-
Dissolved Metals								
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.000015	<0.000015	<0.00001	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00067	0.00101	0.00114	0.00098
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.02	<0.01	0.010	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.0001	<0.00005	0.000126	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00076	0.00091	0.00071	0.00057
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.534	0.378	0.340	0.378
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00596	0.00556	0.00574	0.00657
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0023	0.0032	0.015	0.0027
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	-
Benzo(a)anthracene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	-
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005	<0.000005	<0.000005	-
Chrysene	mg/L	0.0001	-	-	<0.00001	<0.00001	<0.00001	-
Fluoranthene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	-
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	<0.00002	-
Pyrene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	-
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 PE11578 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-3: Summary of East Sedimentation Pond Water Quality Results for Dioxins and Furans Received at the Time of Reporting.

Parameter	Unit	East Sedimentation Pond	
		Influent	Effluent
		SP-E-IN-2	SP-E-OUT
		L2755522-2	L2755522-1
		2024-04-29 16:20	2024-04-29 14:10
Lower Bound PCDD/F TEQ	pg/L	26.9	0.505

Notes:

PCDD = polychlorinated dibenzodioxins (dioxins)

PCDF = polychlorinated dibenzofurans (furans)

TEQ = toxic equivalency

Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).

Table B-4: Summary of East Sedimentation Pond Daily Field Parameters Received at the Time of Reporting.

Parameter	Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen	Total Daily Discharge from the East Sedimentation Pond to Howe Sound	
Unit	°C	mg/L	ppt	NTU	s.u.	µS/cm		m ³	
PE-111578 Discharge Limit ¹	-	-	-	-	5.5 - 9.0	-	-	- ²	
Lowest Applicable Guideline ^{3,4}	-	>=8	-	-	- ⁵	-	-	-	
Station ID	Date								
SP-E-NE	2024-05-19 12:03	16.0	8.34	1.61	3.77	8.1	2548	No	0
SP-E-NW ⁶	2024-05-20 10:19	17.6	10.68	1.57	3.39	8.3	2733	No	-
SP-E-NE	2024-05-20 10:01	16.7	9.89	1.66	3.31	8.1	2662	No	0
SP-E-NW ⁶	2024-05-21 14:13	18.2	9.05	1.51	47.11	8.2	2521	No	-
SP-E-NE	2024-05-21 13:45	17.4	10.62	1.66	3.62	8.1	2700	No	0
SP-E-NE	2024-05-22 15:08	17.6	12.73	0.97	1.73	8.3	1626	No	0
SP-E-OUT	2024-05-23 14:39	17.3	9.78	1.06	1.47	8.9	1761	No	185
SP-E-NE	2024-05-23 14:27	17.1	9.95	1.06	1.24	8.7	1749	No	
SP-E-NE	2024-05-24 13:38	13.8	11.93	1.26	2.61	8.7	2057	No	755
SP-E-NE	2024-05-25 16:38	16.8	8.61	1.14	0.47	9.0	18720	No	0

Notes:

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

Results in **orange** text exceeded the PE11578 East Sedimentation Pond Discharge Limit.

¹ PE-111578 East Sedimentation Pond Discharge Limit applies only to the point of discharge from the East Sedimentation Pond (SP-E-OUT).

² The annual average authorized discharge rate from the East Sedimentation Pond is 650 m³/day. As noted in PE-111578 Condition 2.1.4, the actual discharge rate may deviate from the annual average rate due to annual variations in precipitation amounts within the catchment area. Therefore, daily discharge flows above 650 m³/day are not considered an exceedance of the annual average rate.

³ 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.

⁴ Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

⁵ Discharge limit applies therefore the water quality guideline was not evaluated.

⁶ The sedimentation pond was not receiving influent at the time of monitoring each day May 19 – 25, therefore measurements for station SP-E-IN-2 were not collected. Samples were collected at station SP-E-NW which is proximal to the SP-E-IN-2 inlet and are considered representative of influent that was intermittently directed to the pond May 19 and 20.

No discharge from the East Sedimentation Pond occurred May 19 – 22 and May 25.

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	
			WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT
			VA24B0872-002	VA24B0872-001	VA24B1233-002	VA24B1233-001	VA24B1327-001	VA24B1327-002	VA24B1623-001	VA24B1623-002
			2024-05-15 12:53	2024-05-15 13:37	2024-05-20 10:12	2024-05-20 9:53	2024-05-21 13:50	2024-05-21 13:20	2024-05-22 14:45	2024-05-22 14:55
General Parameters										
pH - Field	pH units	7.0 - 8.7	8.3	8.3	8.0	7.7	7.9	7.9	7.9	7.9
Specific Conductivity - Field	µS/cm	-	2797	2238	2698	2879	2511	2719	2613	2778
Temperature - Field	°C	-	20.1	19.1	17.0	16.4	17.2	17.4	17.2	17.3
Salinity - Field	ppt	-	1.61	1.31	1.67	1.68	1.54	1.67	1.68	1.55
Turbidity - Field	NTU	-	19.77	2.08	0.73	2.20	65.0	2.87	6.90	1.14
TSS	mg/L	-	320	<3	<3	<3	46.5	<3	16.9	<3
Dissolved Oxygen - Field	mg/L	>=8	<u>7.74</u>	<u>6.14</u>	12.95	12.39	12.17	10.45	12.23	12.61
Anions and Nutrients										
Sulphate	mg/L	-	166	115	-	-	-	-	-	-
Chloride	mg/L	-	1130	737	-	-	-	-	844	271
Fluoride	mg/L	-	<0.4	<0.4	-	-	-	-	-	-
Ammonia (N-NH ₃)	mg/L	Variable ⁴	0.0075	0.0153	-	-	-	-	-	-
Nitrite (N-NO ₂)	mg/L	-	<0.02	<0.02	-	-	-	-	-	-
Nitrate (N-NO ₃)	mg/L	3.7	<0.1	<0.1	-	-	-	-	-	-
Total Metals										
Aluminum, total (T-Al)	mg/L	-	13.5	0.129	0.0987	0.0724	2.67	0.0824	0.743	0.194
Antimony, total (T-Sb)	mg/L	-	0.00331	0.00214	0.00242	0.00247	0.00246	0.00235	0.00231	0.00193
Arsenic, total (T-As)	mg/L	0.0125	0.00769	0.00317	0.00283	0.00289	0.00351	0.00279	0.00278	0.00247
Barium, total (T-Ba)	mg/L	-	0.137	0.0184	0.0269	0.0253	0.0444	0.0251	0.0312	0.00589
Beryllium, total (T-Be)	mg/L	0.1	0.000216	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.233	0.043	0.134	0.113	0.172	0.148	0.139	0.079
Cadmium, total (T-Cd)	mg/L	0.00012	<u>0.000468</u>	<0.000015	<0.00002	<0.00002	<u>0.000122</u>	<0.000015	0.0000378	0.0000151
Chromium, total (T-Cr)	mg/L	-	0.0146	<0.001	0.00122	0.00127	0.0048	0.00116	0.00151	0.00104
Cobalt, total (T-Co)	mg/L	-	0.00486	<0.0002	<0.0002	<0.0002	0.00086	<0.0002	0.00028	<0.0001
Copper, total (T-Cu)	mg/L	0.002	<u>0.0316</u>	<0.001	<u>0.00229</u>	0.00126	<u>0.00617</u>	<0.001	<u>0.00329</u>	0.00159
Iron, total (T-Fe)	mg/L	-	11.4	<0.02	<0.02	<0.02	1.86	<0.02	0.494	0.063
Lead, total (T-Pb)	mg/L	0.002	<u>0.0341</u>	0.000184	0.000353	<0.0001	<u>0.00619</u>	<0.0001	0.00192	0.000355
Manganese, total (T-Mn)	mg/L	-	0.305	0.00407	0.00287	0.00296	0.0542	0.00081	0.0158	0.00193
Mercury, total (T-Hg)	mg/L	0.000016	<u>0.0000486</u>	<0.000005	<0.000005	<0.000005	0.0000132	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0353	0.0491	0.0351	0.0357	0.0333	0.0355	0.0322	0.0223
Nickel, total (T-Ni)	mg/L	0.0083	<u>0.01</u>	<0.001	0.00122	0.00182	0.00255	0.00177	0.00168	0.00127
Selenium, total (T-Se)	mg/L	0.002	0.000279	0.000165	0.000162	0.000146	0.000167	0.000122	0.000112	0.000162
Silver, total (T-Ag)	mg/L	0.0015	0.000094	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00001
Thallium, total (T-Tl)	mg/L	-	0.000105	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00001
Uranium, total (T-U)	mg/L	-	0.0219	0.0465	0.0214	0.0223	0.0205	0.02	0.0192	0.015
Vanadium, total (T-V) ⁸	mg/L	0.005	<u>0.0375</u>	<u>0.00613</u>	<u>0.00695</u>	<u>0.00610</u>	<u>0.0116</u>	<u>0.00616</u>	<u>0.0078</u>	<u>0.00516</u>
Zinc, total (T-Zn)	mg/L	0.01	<u>0.116</u>	<0.006	<u>0.011</u>	0.0082	<u>0.0243</u>	<u>0.0108</u>	<u>0.357</u>	0.0051
Hexavalent Chromium, total	mg/L	0.0015	0.0015	0.00075	0.00077	0.00057	0.00072	0.0006	0.00072	0.00083
Dissolved Metals										
Cadmium, dissolved (D-Cd)	mg/L	-	<0.00002	<0.00002	<0.000015	<0.000015	<0.000025	<0.000015	<0.00002	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	0.00147	0.0005	0.00139	0.00085	0.0016	0.00071	0.00158	0.00136
Iron, dissolved (D-Fe)	mg/L	-	<0.02	<0.02	<0.02	<0.02	0.075	<0.02	<0.02	<0.01
Lead, dissolved (D-Pb)	mg/L	-	<0.0001	<0.0001	<0.0001	<0.0001	0.000355	<0.0001	<0.0001	0.00005
Manganese, dissolved (D-Mn)	mg/L	-	0.0147	0.00252	0.00125	0.0028	0.00668	0.00055	0.00419	0.00045
Strontium, dissolved (D-Sr)	mg/L	-	0.58	0.463	0.536	0.534	0.485	0.524	0.485	0.184
Vanadium, dissolved (D-V)	mg/L	-	0.00953	0.00575	0.00691	0.00580	0.00647	0.00594	0.00636	0.00480
Zinc, dissolved (D-Zn)	mg/L	-	0.0024	0.0028	0.0082	0.0087	0.0049	0.0066	0.277	0.0049
Polycyclic Aromatic Hydrocarbons (PAHs)										
Acenaphthene	mg/L	0.006	0.000044	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	<0.000014	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	0.000086	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	0.000273	<0.00001	<0.00001	<0.00001	0.00002	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	<u>0.00026</u>	<0.000005	<0.000005	<0.000005	<u>0.0000164</u>	<0.000005	<0.000005	<0.000005
Chrysene	mg/L	0.0001	<u>0.000291</u>	<0.00001	<0.00001	<0.00001	0.000032	<0.00001	<0.00001	<0.00001
Fluoranthene	mg/L	-	0.000634	<0.00001	<0.00001	<0.00001	0.000082	<0.00001	0.000024	<0.00001
Fluorene	mg/L	0.012	0.000044	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	0.000011	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	0.000015	<0.00001	<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	<0.00005	<0.00005
Phenanthrene	mg/L	-	0.000375	<0.00002	<0.00002	<0.00002	0.000044	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	0.000595	<0.00001	<0.00001	<0.00001	0.000064	<0.00001	0.000019	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	<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	-	-	-	-	-	-
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.

Parameter		Temperature	DO	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen	Total Daily Discharge from East WWTP to East Sedimentation Pond
Unit		°C	mg/L	ppt	NTU	s.u.	µS/cm		m ³
PE-111578 Discharge Limit ¹		-	-	-	-	-	-	-	1,100
Minimum Discharge Objective ²		-	>=8	-	-	7.0 - 8.7	-	-	-
Station ID	Date								
WWTP-E-IN	2024-05-19 12:07	16.6	11.69	1.67	4.91	8.1	2664	No	-
WWTP-E-OUT	2024-05-19 11:59	16.2	8.69	1.56	2.71	7.9	2980	No	428
WWTP-E-IN	2024-05-20 10:12	17.0	12.95	1.67	0.73	8.0	2698	No	-
WWTP-E-OUT	2024-05-20 9:53	16.4	12.39	1.68	2.2	7.7	2879	No	419
WWTP-E-IN	2024-05-21 13:45	17.2	12.17	1.54	65	7.9	2511	No	-
WWTP-E-OUT	2024-05-21 13:17	17.4	10.45	1.67	2.87	7.9	2719	No	367
WWTP-E-IN	2024-05-22 14:52	17.2	12.23	1.68	6.9	7.9	2613	No	-
WWTP-E-OUT	2024-05-22 14:58	17.3	12.61	1.55	1.14	7.9	2778	No	447
WWTP-E-IN	2024-05-23 14:31	22.1	<i>6.21</i>	1.58	5.4	8.4	2852	No	-
WWTP-E-OUT	2024-05-23 15:00	17.4	8.97	1.28	1.04	<i>9.2</i>	2116	No	408
WWTP-E-IN	2024-05-24 13:49	14.8	9.39	1.51	9.77	8.6	2321	Yes	-
WWTP-E-OUT	2024-05-24 13:45	16.9	12.69	1.46	0.42	8.7	2365	No	450
WWTP-E-IN	2024-05-25 16:42	18.7	8.35	1.38	3.45	8.7	2340	No	-
WWTP-E-OUT	2024-05-25 16:34	17.3	8.42	1.38	0.0	<i>9.0</i>	2266	No	370

Notes:

¹ PE-111578 East WWTP Discharge Limit is applied to effluent compliance station WWTP-E-OUT.

² Minimum discharge objective for the WWTP effluent.

Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

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
				VA24B1054-003 2024-05-16 12:40
		Long Term	Short Term	
General Parameters				
pH - Field	pH units	6.5 - 9.0	-	6.6
Specific Conductivity - Field	µS/cm	-	-	65.7
Temperature - Field	°C	-	-	12.1
Salinity - Field	ppt	-	-	0.04
Turbidity - Field	NTU	-	-	0.71
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	9.10
Anions and Nutrients				
Sulphate	mg/L	128 ³	-	2.85
Chloride	mg/L	120	600	0.96
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	0.121
Total Metals				
Aluminum, total (T-Al)	mg/L	0.22 ³	-	<u>0.0841</u>
Antimony, total (T-Sb)	mg/L	0.074	-	<0.0001
Arsenic, total (T-As)	mg/L	0.005	-	0.00012
Barium, total (T-Ba)	mg/L	1	-	0.00753
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	0.0000107
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	-	-	0.00112
Iron, total (T-Fe)	mg/L	0.3	1	0.013
Lead, total (T-Pb)	mg/L	0.0035 ³	0.0050 ³	0.000087
Manganese, total (T-Mn)	mg/L	0.77 ³	0.82 ³	0.00118
Mercury, total (T-Hg)	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	0.073	46	0.00197
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	0.000312
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	0.0000101
Copper, dissolved (D-Cu)	mg/L	0.00090 ³	0.0053 ³	<u>0.00092</u>
Iron, dissolved (D-Fe)	mg/L	-	0.35	<0.01
Lead, dissolved (D-Pb)	mg/L	0.0045 ³	-	<0.00005
Manganese, dissolved (D-Mn)	mg/L	0.32 ³	1.97 ³	0.00058
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.0288
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.0055 ³	0.020 ³	<0.001
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	Station SW-02	Station SW-04	Station SW-07
				Woodfibre Creek Lower Reach	Mill Creek Mid-Reach	East Creek Lower Reach	Mill Creek Background
				SW-01	SW-02	SW-04	SW-07
				VA24B1054-001	VA24B0795-001	VA24B1054-002	VA24B0795-003
		Long Term	Short Term	2024-05-16 12:26	2024-05-14 9:55	2024-05-16 14:56	2024-05-14 12:35
General Parameters							
pH - Field	pH units	6.5 - 9.0	-	7.2	7.5	7.5	6.9
Specific Conductivity - Field	µS/cm	-	-	3.9	58.5	107.1	29.0
Temperature - Field	°C	-	-	7.3	7.0	12.2	8.3
Salinity - Field	ppt	-	-	0.00	0.04	0.07	0.02
Turbidity - Field	NTU	-	-	0.17	0.66	0.87	0.69
TSS	mg/L	-	-	<3	<3	<3	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	17.21	17.15	12.94	13.74
Anions and Nutrients							
Sulphate	mg/L	128 ³	-	<0.3	1.03	2.7	1.07
Chloride	mg/L	120	600	<0.5	<0.5	0.56	<0.5
Fluoride	mg/L	-	0.40 - 0.82 ³	<0.02	<0.02	0.024	<0.02
Ammonia (N-NH ₃)	mg/L	1.82 - 1.91 ³	12.5 - 22.2 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	0.0131	0.0229	0.0480	0.0423
Total Metals							
Aluminum, total (T-Al)	mg/L	0.040 - 0.10 ³	-	<u>0.18</u>	<u>0.0851</u>	0.0796	<u>0.0749</u>
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	0.00011	<0.0001
Barium, total (T-Ba)	mg/L	1	-	0.00132	0.00157	0.00664	0.00144
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 - 0.000055 ³	0.00011 - 0.00057 ³	<0.000005	0.0000051	0.0000116	<0.000005
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	0.0006	0.00104	<0.0005
Iron, total (T-Fe)	mg/L	0.3	1	0.029	0.016	0.253	<0.01
Lead, total (T-Pb)	mg/L	0.0034 - 0.0039 ³	0.003 - 0.016 ³	0.000056	<0.00005	0.000182	<0.00005
Manganese, total (T-Mn)	mg/L	0.77 ³	0.82 - 0.85 ³	0.00093	0.00059	0.0108	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	0.000177	0.000304	0.000827	0.000311
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	0.000587	0.000158	0.000092	0.000154
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	0.0031
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 - 0.000083 ³	0.000038 - 0.00016 ³	<0.000005	<0.000005	<0.000005	0.0000053
Copper, dissolved (D-Cu)	mg/L	0.00020 - 0.00040 ³	0.00080 - 0.0024 ³	<0.0002	<0.0002	<u>0.00068</u>	<0.0002
Iron, dissolved (D-Fe)	mg/L	-	0.35	0.02	<0.01	0.019	<0.01
Lead, dissolved (D-Pb)	mg/L	0.0024 - 0.0039 ³	-	<0.00005	<0.00005	<0.00005	<0.00005
Manganese, dissolved (D-Mn)	mg/L	0.35 - 0.38 ³	1.97 - 2.17 ³	0.00037	0.00025	0.00274	0.00028
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.00241	0.00368	0.0321	0.00359
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.0050 - 0.0084 ³	0.016 - 0.030 ³	<0.001	<0.001	0.0017	<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.

Table E-2: Summary of Freshwater and Estuarine Water Quality Results Received at the Time of Reporting.

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Woodfibre Creek Lower Reach	Mill Creek Mid-Reach	Mill Creek Background	East Creek Lower Reach
		SW-01	SW-02	SW-07	SW-04
		L2755523-1	L2755521-2	L2755521-1	L2755523-2
		2024-04-29 13:15	2024-04-28 14:50	2024-04-28 13:30	2024-04-29 11:00
Lower Bound PCDD/F TEQ	pg/L	0	0.0601	0.0930	0

Notes:

PCDD = polychlorinated dibenzodioxins (dioxins)

PCDF = polychlorinated dibenzofurans (furans)

TEQ = toxic equivalency

Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable compounds are assigned a value of zero (0).

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
				Mill Creek Estuary
		SW-03		
		VA24B0795-002 2024-05-14 11:15		
		Long Term	Short Term	
General Parameters				
pH - Field	pH units	7.0 - 8.7	-	6.6
Specific Conductivity - Field	µS/cm	-	-	11.2
Temperature - Field	°C	-	-	8.4
Salinity - Field	ppt	-	-	0.01
Turbidity - Field	NTU	-	-	0.74
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	-	-	15.73
Anions and Nutrients				
Sulphate	mg/L	-	-	1.21
Chloride	mg/L	-	-	<0.5
Fluoride	mg/L	-	-	<0.02
Ammonia (N-NH ₃)	mg/L	-	-	<0.005
Nitrite (N-NO ₂)	mg/L	-	-	<0.001
Nitrate (N-NO ₃)	mg/L	-	-	0.0261
Total Metals				
Aluminum, total (T-Al)	mg/L	-	-	0.0786
Antimony, total (T-Sb)	mg/L	-	-	<0.0001
Arsenic, total (T-As)	mg/L	-	-	<0.0001
Barium, total (T-Ba)	mg/L	-	-	0.00158
Beryllium, total (T-Be)	mg/L	-	-	<0.0001
Boron, total (T-B)	mg/L	-	-	<0.01
Cadmium, total (T-Cd)	mg/L	-	-	<0.000005
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	-	-	0.013
Lead, total (T-Pb)	mg/L	0.002	0.14	<0.00005
Manganese, total (T-Mn)	mg/L	-	-	0.00047
Mercury, total (T-Hg) ³	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.000378
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	-	-	0.000163
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	-	-	<0.0000050
Copper, dissolved (D-Cu)	mg/L	-	-	0.00021
Iron, dissolved (D-Fe)	mg/L	-	-	<0.010
Lead, dissolved (D-Pb)	mg/L	-	-	<0.000050
Manganese, dissolved (D-Mn)	mg/L	-	-	0.00026
Strontium, dissolved (D-Sr)	mg/L	-	-	0.00474
Vanadium, dissolved (D-V)	mg/L	-	-	<0.00050
Zinc, dissolved (D-Zn)	mg/L	-	-	<0.0010
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.

Table F-2: Summary of Estuarine Water Quality Results for Dioxin and Furan Results Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		L2755521-3
		2024-04-28 16:00
Lower Bound PCDD/F TEQ	pg/L	0.00181

Notes:

PCDD = polychlorinated dibenzodioxins (dioxins)

PCDF = polychlorinated dibenzofurans (furans)

TEQ = toxic equivalency

Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable compounds are assigned a value of zero (0).

Appendix G: Marine Water Receiving Environment Results

Table G-1: Summary of IDZ Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	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
		2024-04-30 12:15	2024-04-30 11:45	2024-04-30 11:15	2024-04-30 14:30	2024-04-30 14:15	2024-04-30 12:30
Lower Bound PCDD/F TEQ	pg/L	0.000528	0.0266	0.00588	0.0209	0.0158	0.0258

Notes:

PCDD = polychlorinated dibenzodioxins (dioxins)

PCDF = polychlorinated dibenzofurans (furans)

TEQ = toxic equivalency

Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable compounds are assigned a value of zero (0).

Table G-2: Summary of Reference Station Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting

Parameter	Unit	Reference Station WQR1			Reference 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
		2024-04-30 15:45	2024-04-30 15:30	2024-04-30 15:00	2024-04-30 11:00	2024-04-30 10:30	2024-04-30 10:00
Lower Bound PCDD/F TEQ	pg/L	0.941	0	0.00388	0.0518	0.105	0.0598

Notes:

PCDD = polychlorinated dibenzodioxins (dioxins)

PCDF = polychlorinated dibenzofurans (furans)

TEQ = toxic equivalency

Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable compounds are assigned a value of zero (0).