

## TECHNICAL MEMORANDUM

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**To:** Ian McAllister, Ashleigh Crompton, Mike Champion, Jackie Boruch and Ryan Schucroft (Woodfibre LNG)      **Date:** 13 July 2024

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

**Subject:** PE-111578 Weekly Discharge and Compliance Report #21 for June 30 – July 6

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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 #21) was prepared by Lorax Environmental and summarizes monitoring conducted the week of June 30 – July 6 for contact waters directed to a WWTP or a sedimentation pond. Monitoring data and pending results from prior reporting periods available at the time of reporting are tabulated and included as appendices. Report #21 has been prepared to meet the 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 June 30 – July 6 monitoring period. The East WWTP is constructed and operating, and the East Sedimentation Pond has been commissioned for discharge. 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 catchments contact water conveyance ditches described in PE-111578 were designed to transport non-contaminated contact water to the East and West sedimentation ponds and 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 by pumping to the East Sedimentation Pond or East WWTP. 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 the outfall is 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. However, the pond has been used to store contact water that is subsequently directed to the East WWTP for treatment. The schedule for completion of the pond outfall structure is being revised. The West WWTP has been partially assembled and commissioning of the WWTP is planned for mid-July with the commencement of pilot trials.

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

Pilot testing of the East WWTP continued during the monitoring period (June 30 – July 6). Due to generally dry conditions, there were minimal flows of contact waters from excavations within the East and West Catchment, therefore the East WWTP and the East and West sedimentation ponds did not receive contact water June 30 – July 6. Water was recirculated from the East Sedimentation

Pond through the East WWTP which discharged a total of 3,449 m<sup>3</sup> of treated effluent back to the East Sedimentation Pond. Daily WWTP effluent flows are provided in Appendix C (Table C-2).

There were no discharges from the East and West Sedimentation Ponds during the monitoring period (June 30 – July 6), except on July 1 and 2. A total of 431 m<sup>3</sup> intermittently discharged from the East Sedimentation Pond on July 1 and July 2. Daily effluent flows are provided in Appendix B (Table B-3). Photographs of the ponds are included in Appendix A (Figure 2 and Figure 3).

The weather was generally warm and dry during the monitoring period (June 30 – July 6) with precipitation recorded only on June 30 at the on-site weather station (6.6 mm). The daily weather conditions are summarized in Table 1.

**Table 1:  
Summary of Certified Project Area (CPA) Daily Weather Conditions.**

Date	Precipitation (mm)	Max. Temp (°C)	Min. Temp (°C)	Weather Description
06/30/2024	6.6	21.5	14.0	Overcast
07/01/2024	0.0	21.0	13.5	Partly Cloudy
07/02/2024	0.0	21.1	12.1	Partly Cloudy
07/03/2024	0.0	21.1	12.1	Partly Cloudy
07/04/2024	0.0	23.0	12.5	Sun
07/05/2024	0.0	24.3	14.1	Sun
07/06/2024	0.0	26.3	14.7	Sun

## 2. Monitoring Summary

The PE-111578 authorized works were under construction during the June 30 – July 6 monitoring period. Compliance monitoring stations are progressively established 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 IDZ-E1, IDZ-E2, WQR1, WQR2, WWTP-E-IN, WWTP-E-OUT, SP-E-NE, and SP-E-OUT were monitored during the monitoring period (June 30 – July 6). Sampling dates and parameters tested are summarized in Table 2.

Overall, the PE-111578 monitoring requirements that were applicable during the monitoring period (June 30 – July 6) were met. However, field parameters and analytical samples were not collected at station SP-E-IN-2, the East Sedimentation Pond non-contaminated contact water influent station. The pond did not receive contact water inflows, therefore daily field parameters and a weekly analytical sample were not collected at station SP-E-IN-2.

**Table 2:  
Summary of PE-111578 monitoring samples collected June 30 – July 6.**

Sampling Date	Sample	Description	Parameters Tested	Monitoring Frequency
June 30, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
July 1, 2024	SP-E-OUT	East Sedimentation Pond effluent (compliance point)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Methylmercury (SP-E-OUT only).	D, W <sub>1</sub> , W <sub>2</sub> , P
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
July 2, 2024	SP-E-OUT	East Sedimentation Pond effluent (compliance point)	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
	IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	Field and Physical Parameters, Total Metals	P
	IDZ-E2-0.5	Howe Sound IDZ station E2; 0.5 m below surface		
WQR1-0.5	Reference site 1; 0.5 m below surface.			
July 3, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
	IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	Field and Physical Parameters, Total Metals	W <sub>2</sub> , P
	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.			
July 4, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
July 5, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
July 6, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	WWTP-E-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		

**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.

W<sub>1</sub> – initial high frequency monitoring for physical parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 6 months of monitoring).

W<sub>2</sub> - initial high frequency monitoring for all parameters at WWTP and sedimentation pond influent and effluent stations (weekly for the first 5 weeks of monitoring).

W<sub>3</sub> – 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.

<sup>1</sup> In-Pond stations SP-E-NW and SP-E-NE may be monitored in place of stations SP-E-IN-2 and SP-E-OUT, respectively, when there is no influent to, or discharge from the East Sedimentation Pond at the time of monitoring.

### 3. Water Quality Results

#### 3.1 Screening and Reporting Overview

Water quality and flow monitoring results are screened against field quality control (QC) criteria, benchmark values and PE-111578 discharge limits. The screening results are discussed in the following sections and items outside the screening criteria are also summarized in the Section 4 tracking table (Table 7).

All water quality results are stored in the Woodfibre LNG environmental monitoring database. However, for brevity, a sub-set of the results are presented in the weekly report appendices. Results are reported for parameters with a freshwater, estuarine or marine water quality guideline for the protection of aquatic life, parameters with a discharge limit, parameters of potential concern (*i.e.*, dioxins and furans), as well as other parameters that are relevant for water quality characterization.

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 single TEQ values for each sample by the laboratory. Consistent with the pre-construction baseline 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.

#### 3.2 Summary of Reported Results

Field measurements and analytical results available at the time of reporting for samples collected during the monitoring period (June 30 – July 6) and for other samples that have not been previously reported are listed below in Table 3.

Analytical results for methylmercury, dioxins and furans were not reported for the following samples and will be included in future weekly reports when available (these tests typically require up to 4 weeks to complete):

- SW-01, SW-04, SW-07 collected June 26 (methylmercury, dioxins and furans)
- OUT-02 collected June 26 (methylmercury)
- SW-02 and SW-03 collected June 27 (methylmercury, dioxins and furans)
- SP -E-OUT collected July 1 (dioxins and furans)

**Table 3:  
Summary of Analytical Results Included in Weekly Discharge and Compliance Report #21.**

Sample	Description	Sampling Date	Parameters Reported
SW-01	Lower Reach of Woodfibre Creek (near the mouth)	June 26, 2024	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)		
SW-07	Upstream Mill Creek (at the diversion inlet)		
OUT-02	Non-Contact Water Diversion Ditch Outlet	June 27, 2024	Field, Physical and General Parameters, Total and Dissolved Metals.
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)		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)		
SP-E-OUT	East Sedimentation Pond effluent (compliance point)	July 1, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, VOCs, and (for sample SP-E-OUT) methylmercury
WWTP-E-OUT	East WWTP effluent		
WWTP-E-IN	East WWTP influent		
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	July 2, 2024	Physical Parameters and Total Metals.
IDZ-E2-0.5	Howe Sound IDZ station E2; 0.5 m below surface		
WQR1-0.5	Reference site 1; 0.5 m below surface.		
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	July 3, 2024	Field and Physical Parameters, Total Metals.
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.		

### 3.3 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 and Table B-2 (analytical results) and Table B-3 (field measurements) of Appendix B.

During the monitoring period (June 30 – July 6), the East Sedimentation Pond received East WWTP treated effluent each day. The sedimentation pond did not receive contact water during the monitoring period; therefore, field measurements and analytical samples at station SP-E-IN-2 were not collected.

Daily field measurements at in-pond effluent station SP-E-NE met PE-111578 discharge limits for pH and the WQG for dissolved oxygen, except for dissolved oxygen measurements on June 30 and July 4 – 6 when values were below the lower limit of the WQG (8.0 mg/L). However, the pond did not discharge June 30 and July 4 – 6.

Based on favourable in-pond water quality results received prior to July 1, the East Sedimentation Pond was intermittently dewatered on July 1 and 2 by pumping effluent to the discharge location at station SP-E-OUT. Field measurements and analytical results for the effluent sample (SP-E-OUT) collected on July 1 met PE-111578 discharge limits and WQGs, except total zinc (Table 4) and total mercury and dissolved oxygen (Table 5). The total zinc concentration (0.0183 mg/L) exceeded the discharge limit (0.0133 mg/L) by 1.4 times. The calculated BC WQG for total mercury in this sample is 0.0044 µg/L and the total mercury concentration was reported as not detected (<0.0050 µg/L) with the detection limit equal to 1.14 times the WQG value. Field measurements of dissolved oxygen in effluent sample SP-E-OUT collected on July 1 and 2 (7.43 and 7.55 mg/L, respectively) did not meet the WQG ( $\geq 8$  mg/L; Table 5). The mixing zone model indicates the effluent dissolved oxygen, total mercury and total zinc concentrations would meet the WQG within the initial mixing zone (IDZ) defined in PE-111578.

Methylmercury was available at the time of reporting for the July 1 SP-E-OUT sample and the reported concentration was 0.000113 µg/L.



**Table 4:**  
**Summary of Discharge Limit Exceedances for Effluent Discharged from the East Sedimentation Pond Station SP-E-OUT.**

Parameter	Units	Discharge Limit	N	N > Discharge Limit	Commentary
Total Zinc	mg/L	0.0133	1	1	Based on favourable in-pond water quality results that met the discharge limits and were received prior to July 1, the East Sedimentation Pond was intermittently dewatered on July 1 and 2 by pumping effluent to the discharge location at station SP-E-OUT. Analytical results from the sample collected on July 1 from SP-E-OUT showed a concentration above the discharge limit for total zinc (0.0183 mg/L). Initial field-level investigation found a zinc-plated component in the sample collection port, and it is speculated this is a potential source of sample contamination for zinc. The fixture on the sample collection port will be replaced with non-zinc plated steel as soon as practical. The mixing zone model indicates the concentration of total mercury in effluent would meet WQGs within the initial dilution zone (IDZ) defined in PE-111578.

PE-111578 discharge limits for the East Sedimentation Pond.  
 N = number of samples.  
 Non-detect results are screened using the detection limit value.

**Table 5:**  
**Summary of WQG Exceedances for the East Sedimentation Pond at Effluent Station SP-E-OUT.**

Parameter	Units	WQG (LT)	N	N > WQG	Commentary
Dissolved Oxygen	mg/L	$\geq 8.0$	2	2	The field measurement of dissolved oxygen at the effluent station (SP-E-OUT) on July 1 (7.43 mg/L) and July 2 (7.55 mg/L) were below the lower limit of the WQG. The concentrations are in the range of baseline values observed in marine water samples and the mixing zone model indicates the concentration would be raised above the lower limit of the WQG within the initial dilution zone defined in PE-111578. The root cause of the low dissolved oxygen concentrations is under investigation and will be tracked in Section 4 of this report.
Total Mercury	mg/L	0.0044 $\mu\text{g/L}$	1	1	The reported concentration for total mercury in the sample collected from SP-E-OUT on July 1 was below the routine detectable limit ( $<0.0050 \mu\text{g/L}$ ); however, the detection limit value exceeds the sample-specific calculated BC WQG (0.0044 $\mu\text{g/L}$ ) by 1.14 times. Total mercury is within the range of concentrations observed in baseline data. However, the methyl mercury concentration (0.000113 $\mu\text{g/L}$ ) is approximately 1.4 times higher than the maximum observed baseline concentration in marine water (0.000080 $\mu\text{g/L}$ ). The concentration of methylmercury in the July 1 sample is the primary reason the sample-specific WQG value for total mercury (0.0044 $\mu\text{g/L}$ ) is lower than the typically used 0.016 $\mu\text{g/L}$ screening value. The mixing zone model indicates the concentration of total mercury in effluent would meet the WQG within the initial dilution zone (IDZ) defined in PE-111578.

WQG = British Columbia or Canadian Water Quality Guideline for the Protection of Aquatic Life. LT = long-term freshwater or estuarine aquatic life guideline. Variable dependant guidelines were calculated for each sample using sample specific parameter values. The nearest boundary value was used if a variable was outside the formula range.  
 N = number of samples.  
 Non-detect results are screened using the detection limit value.

### 3.4 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 6 for parameter concentrations that do not meet MDOs.

The East WWTP received recirculated East Sedimentation Pond water each day June 30 – July 6 (Section 2). The influent waters were treated by the East WWTP and discharged back to the East Sedimentation Pond. 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 July 1.

Field measurements of pH at East WWTP influent (station WWTP-E-IN) collected June 30 – July 6 ranged from pH 7.3 to 8.3, dissolved oxygen ranged from 6.21 to 8.81 mg/L and turbidity readings ranged from 3.94 to 29.3 NTU. The field measurements met the MDOs for pH. Field measurements for dissolved oxygen were below the lower limit of the MDO ( $\geq 8$  mg/L) in all samples collected at the influent station during the monitoring period except on June 30 (8.81 mg/L).

Field pH, turbidity and dissolved oxygen in East WWTP effluent samples (station WWTP-E-OUT) ranged from pH 6.8 to 8.1, 0.39 to 3.28 NTU and 1.89 to 8.79 mg/L, respectively (Appendix C, Table C-2). The effluent field measurements met the MDOs for pH, except on June 30 (pH 6.8). Field measurements for dissolved oxygen did not meet the MDO ( $\geq 8$  mg/L) in all samples collected from the effluent station during the monitoring period except on July 1 (8.79 mg/L). Pilot testing of the East WWTP is underway and the deviations in pH are attributed to WWTP process adjustments during the monitoring period. Although deviations from MDOs are expected to occasionally occur during the East WWTP pilot trial, due to the increasing frequency of low dissolved oxygen values an investigation is underway to identify root cause and potential mitigations for low oxygen concentrations (Table 6).

An analytical sample of East WWTP effluent (station WWTP-E-OUT) was collected July 1 and tested for all parameters under PE-111578 (Table 2). The results met MDOs for all parameters.

**Table 6:  
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 below the lower limit of the MDO on June 30 (pH 6.8). Process adjustments are underway and occasional deviations from MDOs may occur during the pilot period.
Field Dissolved Oxygen (DO)	mg/L	>=8	7	6	Field DO was below the lower limit MDO for DO in the field measurement collected from WWTP-E-OUT for all samples collected during the monitoring period except on July 1 (8.79 mg/L). The root cause of the low dissolved oxygen concentrations is under investigation and will be tracked in Section 4 of this report.

MDO = Minimum discharge objective.

N = number of samples.

Non-detect results are screened using the detection limit value.

### 3.5 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 June 26 non-contact water diversion ditch outlet sample (OUT-02) described in Weekly Report #19 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 for creek water and are therefore not considered to be exceedances.

### 3.6 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 June 26 and 27 samples discussed in Weekly Report #19 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).

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 (stations SW-02 and SW-07), except field pH (SW-07 only), total aluminum and dissolved copper (SW-07 only), and at Woodfibre and East Creek stations, except field pH, total aluminum, and dissolved copper at Woodfibre Creek (station SW-01) and dissolved copper at East Creek (station SW-04;

Appendix E). Parameter concentrations met WQGs at the Mill Creek estuary (station SW-03) except field pH. Field pH values 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.

### **3.7 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.

Analytical results for July 2 marine water monitoring at IDZ-E1, IDZ-E2, and WQR1 at 0.5 m below the water surface (Table 2) were available at the time of reporting and met WQGs except for total copper in the one sample from IDZ-E1. The concentrations of total copper in the samples ranged from 0.00164 to 0.00292 mg/L and were above the WQG (0.002 mg/L) in the one sample collected from 0.5 m below surface at IDZ-E1.

Analytical results for July 3 marine water monitoring at IDZ-E1, IDZ-E2, WQR1, and WQR2 at 0.5 and 2 m below the water surface and 2 m above the seafloor (Table 2) were available at the time of reporting and met WQGs except for total boron. The concentrations of total boron in the samples ranged from <0.3 to 2.77 mg/L and were above the WQG (1.2 mg/L) in samples collected from 2 m above the seafloor at IDZ-E1, IDZ-E2, WQR1, and WQR2.

The reported concentrations of total boron and total copper 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 7). 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. Items flagged for follow-up in the exceedance tables in Section 3 are transferred to Table 7. Any items flagged for follow-up in Table 7 are carried forward to future reports until they are closed.

**Table 7:  
Weekly Report QC Evaluations and Ongoing Items**

QC Procedure	Observation	Investigation/Resolution
<b>Reporting Period (June 30 – July 6, Report #21)</b>		
<b>Monitoring Program Evaluation</b>	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.
<b>Monitoring Program Evaluation</b>	The monitoring records collected since commissioning of the East WWTP and East Sedimentation Pond are being reviewed regarding frequency and parameters tested.	<p>Monitoring records from commissioning of the East Sedimentation Pond for discharge (April 14) to the end of Report #20 monitoring period (June 29) were reviewed. Overall, samples were collected from the established monitoring stations at the PE-111578 required frequencies (i.e., daily, weekly, monthly and quarterly) and tested for the required parameters.</p> <ul style="list-style-type: none"> <li>The PE-111578 specified sampling frequencies were not met at East Sedimentation Pond influent and effluent stations SP-E-IN-2 and SP-E-OUT, primarily for daily and weekly monitoring at the sedimentation pond. Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring.</li> <li>The PE-111578 specified weekly and monthly sampling frequencies were not met at clean water diversion ditch outlets (stations OUT-01, OUT-02, OUT-06 and OUT-11). Flows at these stations were infrequent and samples were only collected when there were flows at the time of monitoring.</li> <li>High frequency monitoring samples (i.e., first five weeks and 5-in-30 sampling) at sedimentation pond, WWTP and receiving environment stations were generally not collected over 5 consecutive weeks, there is a one week gap for most stations such that 5 samples were collected over 6 weeks. The “first five weeks” and “5-in-30” monitoring periods partially overlap therefore the same samples apply to both monitoring frequencies.</li> <li>In some instances, samples were tested for a partial parameter list instead of the full list. This was resolved early June but required further review with site staff.</li> <li>Marine reference station WQR2 was overlooked for two of the weekly sampling events. This was resolved early June.</li> </ul> <p>These findings have been reviewed with site QEPs for water management. The following actions will be implemented:</p> <ol style="list-style-type: none"> <li>Flexible scheduling for monitoring stations where there are infrequent flows to ensure monitoring is conducted when flows are occurring. This applies primarily to diversion ditch outlets, and sedimentation pond influent and effluent stations.</li> <li>Procedures will be adjusted to confirm that tests requested for PE-111578 required samples include all permit specified parameters.</li> <li>Weekly monitoring (i.e., “first five weeks”) for full parameters at permit specified WWTP, IDZ and SP stations will continue until BCER indicates that the frequency can be reduced to monthly.</li> </ol> <p>This item is closed.</p>
<b>WWTP Performance Evaluation</b>	Dissolved oxygen is frequently outside the treatment MDO	Dissolved oxygen levels are generally low and outside the MDO for East WWTP influent and effluent, and are also generally low and outside the WQG in the East Sedimentation Pond waters. This situation is currently being investigated to identify root cause(s) and potential mitigation(s). This item remains open.
<b>Pending Data</b>	Dioxin and furan results for samples collected July 1 were not reported.	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 early August. This item remains open.
<b>Ongoing Items from Previous Weekly Reports</b>		
<b>Report #13: WWTP Performance Evaluation</b>	The May 6 monitoring results for East WWTP indicate dissolved vanadium was not being removed by the treatment process.	Sampling conducted since May 6 indicates vanadium in treated WWTP effluent is almost entirely in soluble form, suggesting this form of vanadium is only partially treated, resulting in residual vanadium concentrations in the treated effluent that are generally below, but often in the vicinity of the MDO concentration (0.005 mg/L). Process adjustments are underway to improve vanadium removal as part of the WWTP pilot trials. This item remains open.
<b>Report #17: Pending Data</b>	Methyl mercury, dioxin and furan results for samples collected June 3 – 4 and June 8 were not reported.	Available methylmercury results for the June 3 SP-E-OUT sample are discussed in Section 3.3 of Report #17. The same section in Report #18 includes the June 4 and June 8 methylmercury results. Dioxin and furan results for samples collected June 3 – 4, and June 8 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 mid July. This item remains open.
<b>Report # 18: Pending Data</b>	Dioxin and furan results for samples collected June 10 were not reported.	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 mid July. This item remains open.
<b>Report #19: Pending Data</b>	Methyl mercury, dioxin and furan results for samples collected June 16 and June 22 were not reported.	Available methylmercury results are discussed in Section 3.3 of Report #20. 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 July. This item remains open.
<b>Report #20: Pending Data</b>	Dioxin and furan results for samples collected June 25 were not reported.	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 early August. This item remains open.
	Analytical results for samples collected June 26 – 27 were not reported.	Available analytical results for freshwater receiving environment samples collected June 26 – 27 are discussed in Section 3.6 of Report #21. Methylmercury, dioxin 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 mid August. 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, and Woodfibre LNG staff are conducted as needed to confirm the information presented in this report.

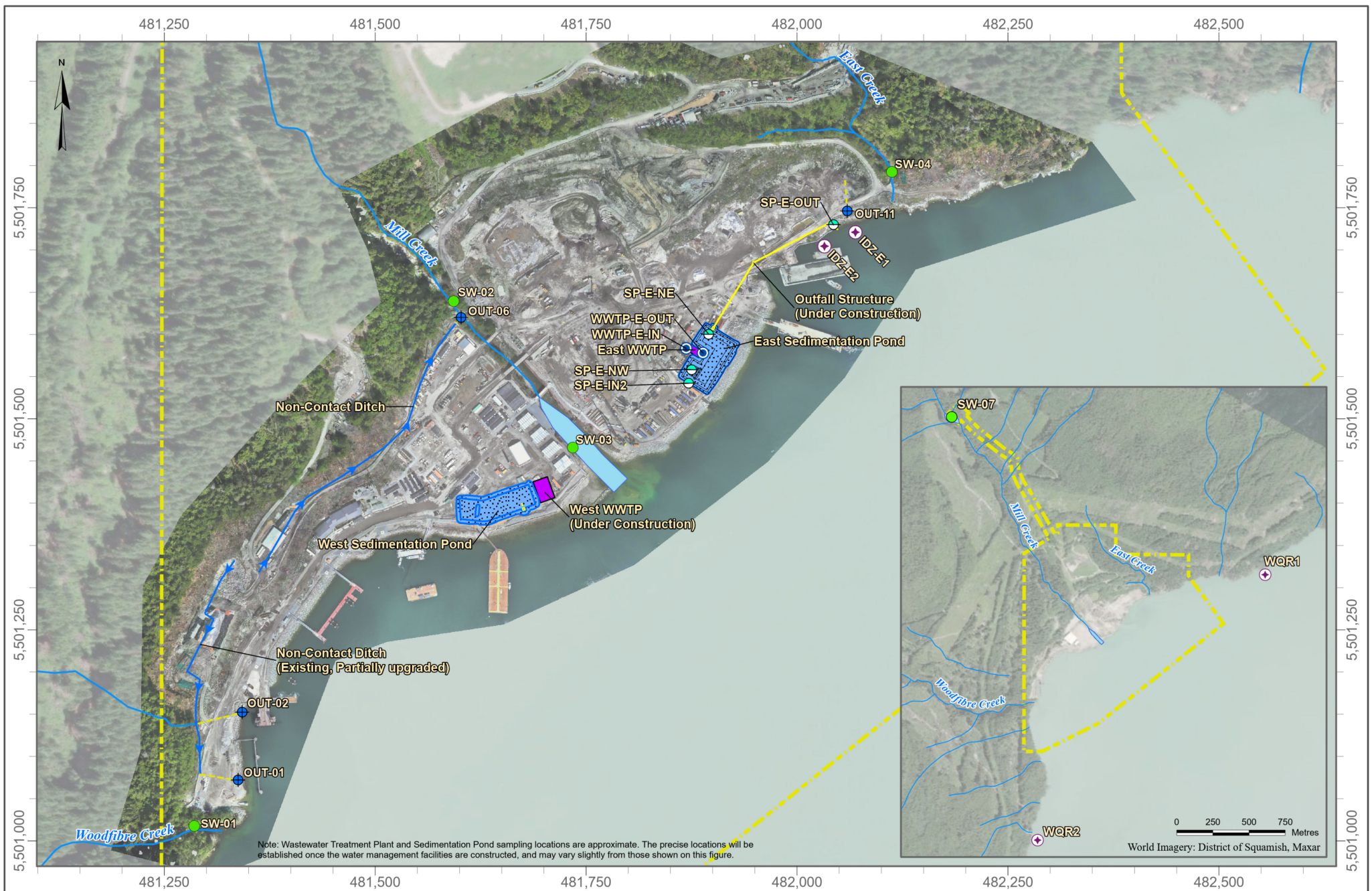
Regards,

**LORAX ENVIRONMENTAL SERVICES LTD.**

**Holly Pelletier, B.Sc., GIT**  
Environmental Geoscientist

The stamp is a hexagonal logo for the Association of the Chemical Profession of British Columbia. It contains the following text: 'Professional BC Chemist', '2008135', 'Patrick Mueller', and 'Association of the Chemical Profession of British Columbia'.

**Patrick Mueller, B.Sc., P.Chem.**  
Environmental Chemist



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: Jul 12, 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

CLIENT:

PROJECT:

### Woodfibre LNG Project Construction Phase

TITLE:  
 Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (July 6, 2024)

PROJECT #: A633-7

FIGURE: 1

## ***Appendix A: East and West Catchment Photographs***





**Figure 2: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains (July 2, 2024). The East WWTP is located on the left side of the pond.**



**Figure 3: Aerial view showing the West Sedimentation Pond and West WWTP (located to the right of the pond) on July 2, 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	Unit	Lowest Applicable Guideline <sup>1,2</sup>		PE-111578 Discharge Limit *	East Sedimentation Pond
		Long Term	Short Term		Effluent
					SP-E-OUT VA24B5679-003 2024-07-01 16:10
<b>General Parameters</b>					
pH - Field	pH units	- <sup>6</sup>	-	5.5 - 9.0	7.2
Conductivity - Field	µS/cm	-	-	-	1623
Temperature - Field	°C	-	-	-	23.1
Salinity - Field	ppt	-	-	-	0.82
Turbidity - Field	NTU	-	-	-	3.50
TSS	mg/L	-	-	25	<3
Dissolved Oxygen - Field	mg/L	>=8	-	-	<b>7.43</b>
<b>Anions and Nutrients</b>					
Sulphate	mg/L	-	-	-	54.8
Chloride	mg/L	-	-	-	304
Fluoride	mg/L	-	1.5	-	<0.2
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>3</sup>	Variable <sup>3</sup>	-	0.0206
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	<0.01
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	339	-	0.0554
<b>Total Metals</b>					
Aluminum, total (T-Al)	mg/L	-	-	-	0.206
Antimony, total (T-Sb)	mg/L	-	0.27 <sup>4</sup>	-	0.00186
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00228
Barium, total (T-Ba)	mg/L	-	-	-	0.0065
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.099
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	0.0000302
Chromium, total (T-Cr)	mg/L	-	-	-	0.00062
Cobalt, total (T-Co)	mg/L	-	-	-	<0.0001
Copper, total (T-Cu)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0043	0.00326
Iron, total (T-Fe)	mg/L	-	-	-	0.112
Lead, total (T-Pb)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0035	0.00197
Manganese, total (T-Mn)	mg/L	-	-	-	0.00296
Mercury, total (T-Hg) <sup>5</sup>	mg/L	0.0000044	-	-	<b>&lt;0.000005</b>
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0261
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000136
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	-	0.000019
Uranium, total (T-U)	mg/L	-	-	-	0.016
Vanadium, total (T-V)	mg/L	- <sup>6</sup>	-	0.0081	0.00444
Zinc, total (T-Zn)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0133	<b>0.0183</b>
Hexavalent Chromium, total	mg/L	0.0015	-	-	<0.0005
<b>Dissolved Metals</b>					
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00175
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	-	0.000523
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00083
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.155
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00407
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0075
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>					
Acenaphthene	mg/L	0.006	-	-	<0.00001
Acridine	mg/L	-	-	-	<0.00001
Anthracene	mg/L	-	-	-	<0.00001
Benz(a)anthracene	mg/L	-	-	-	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005
Chrysene	mg/L	0.0001	-	-	<0.00001
Fluoranthene	mg/L	-	-	-	<0.00001
Fluorene	mg/L	0.012	-	-	<0.00001
1-methylnaphthalene	mg/L	0.001	-	-	<0.00001
2-methylnaphthalene	mg/L	0.001	-	-	<0.00001
Naphthalene	mg/L	0.001	-	-	<0.00005
Phenanthrene	mg/L	-	-	-	<0.00002
Pyrene	mg/L	-	-	-	<0.00001
Quinoline	mg/L	-	-	-	<0.00005
<b>Volatile Organic Compounds (VOCs)</b>					
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 PE111578 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).

<sup>1</sup> 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.

<sup>2</sup> Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

<sup>3</sup> 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).

<sup>4</sup> The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.

<sup>5</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L. The Canadian WQG = 0.000016 mg/L. For the July 1 sample, the BC WQG = 0.0000044 mg/L, and is the lowest guideline applicable to this sample.

<sup>6</sup> 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 for Methylmercury Received  
at the Time of Reporting.**

Parameter	Unit	East Sedimentation Pond
		Effluent
		SP-E-OUT
		VA24B5679-003
		2024-07-01 16:10
Methylmercury	µg/L	0.000113

**Table B-3:  
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 <sup>3</sup>	
PE-111578 Discharge Limit <sup>1</sup>	-	-	-	-	5.5 - 9.0	-	-	- <sup>2</sup>	
Lowest Applicable Guideline <sup>3,4</sup>	-	>=8	-	-	- <sup>5</sup>	-	-	-	
Station ID <sup>6</sup>	Date								
SP-E-NE	2024-06-30 13:12	22.6	<u>7.87</u>	0.81	16.6	7.4	1532	No	0
SP-E-NE	2024-07-01 15:18	-	-	-	4.37	7.1	-	No	146
SP-E-OUT	2024-07-01 15:42	23.1	<u>7.43</u>	0.82	3.5	7.2	1623	No	
SP-E-NE	2024-07-02 11:39	22.3	8.44	0.47	14.9	7.5	908	No	284
SP-E-OUT	2024-07-02 11:43	22.0	<u>7.55</u>	0.81	14.0	7.8	1516	No	
SP-E-NE	2024-07-03 14:47	25.0	8.05	0.83	5.83	7.7	1655	No	0
SP-E-NE	2024-07-04 16:02	27.1	<u>6.62</u>	0.84	25.9	8.3	1734	No	0
SP-E-NE	2024-07-05 15:18	27.8	<u>6.62</u>	0.84	15.4	7.8	1760	No	0
SP-E-NE	2024-07-06 16:02	29.1	<u>6.08</u>	0.85	10.49	8.2	1826	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.

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

<sup>2</sup> The annual average authorized discharge rate from the East Sedimentation Pond is 650 m<sup>3</sup>/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, the annual average authorized discharge rate is not evaluated as a discharge limit.

<sup>3</sup> 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.

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

<sup>5</sup> Discharge limit applies therefore the water quality guideline was not evaluated.

<sup>6</sup> The sedimentation pond did not receive non-contaminated contact water influent June 30 – July 6, therefore daily measurements for station SP-E-IN-2 were not collected. The pond did not discharge on June 30 nor after July 2, therefore field measurements were not collected at SP-E-OUT. In-Pond stations SP-E-NW and SP-E-NE may be monitored in place of stations SP-E-IN-2 and SP-E-OUT, respectively when there is no influent to, or discharge from the East Sedimentation Pond at the time of monitoring.

## ***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 <sup>1</sup>	East WWTP	
			Influent	Effluent
			WWTP-E-IN	WWTP-E-OUT
			VA24B5679-001 2024-07-01 15:52	VA24B5679-002 2024-07-01 15:30
<b>General Parameters</b>				
pH - Field	pH units	7.0 - 8.7	7.3	7.0
Conductivity - Field	µS/cm	-	1630	1634
Temperature - Field	°C	-	23.1	22.6
Salinity - Field	ppt	-	0.82	0.83
Turbidity - Field	NTU	-	3.94	1.30
TSS	mg/L	-	<3	<3
Dissolved Oxygen - Field	mg/L	>=8	<u>7.77</u>	8.79
<b>Anions and Nutrients</b>				
Sulphate	mg/L	-	55.5	54.2
Chloride	mg/L	-	304	301
Fluoride	mg/L	-	<0.2	<0.2
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable	0.016	0.043
Nitrite (N-NO <sub>2</sub> )	mg/L	-	<0.01	<0.01
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	0.0566	0.0662
<b>Total Metals</b>				
Aluminum, total (T-Al)	mg/L	-	0.284	0.0335
Antimony, total (T-Sb)	mg/L	-	0.00183	0.00186
Arsenic, total (T-As)	mg/L	0.0125	0.00226	0.00198
Barium, total (T-Ba)	mg/L	-	0.00742	0.00537
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.099	0.104
Cadmium, total (T-Cd)	mg/L	0.00012	<0.000025	<0.00001
Chromium, total (T-Cr)	mg/L	-	0.00068	<0.0005
Cobalt, total (T-Co)	mg/L	-	0.0001	<0.0001
Copper, total (T-Cu)	mg/L	0.002	<u>0.00444</u>	0.00089
Iron, total (T-Fe)	mg/L	-	0.164	<0.01
Lead, total (T-Pb)	mg/L	0.002	0.00132	<0.00005
Manganese, total (T-Mn)	mg/L	-	0.00446	0.00012
Mercury, total (T-Hg)	mg/L	0.000016	0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0252	0.0258
Nickel, total (T-Ni)	mg/L	0.0083	0.00051	<0.0005
Selenium, total (T-Se)	mg/L	0.002	0.000155	0.000134
Silver, total (T-Ag)	mg/L	0.0015	<0.00001	<0.00001
Thallium, total (T-Tl)	mg/L	-	0.000019	0.000022
Uranium, total (T-U)	mg/L	-	0.0166	0.0155
Vanadium, total (T-V)	mg/L	0.005	0.00460	0.00355
Zinc, total (T-Zn)	mg/L	0.01	<u>0.046</u>	<0.003
Hexavalent Chromium, total	mg/L	0.0015	0.00061	<0.0005
<b>Dissolved Metals</b>				
Cadmium, dissolved (D-Cd)	mg/L	-	<0.000015	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	0.00189	0.00087
Iron, dissolved (D-Fe)	mg/L	-	<0.01	<0.01
Lead, dissolved (D-Pb)	mg/L	-	0.000125	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	0.00137	0.00011
Strontium, dissolved (D-Sr)	mg/L	-	0.148	0.168
Vanadium, dissolved (D-V)	mg/L	-	0.00425	0.00355
Zinc, dissolved (D-Zn)	mg/L	-	0.0081	<0.001
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>				
Acenaphthene	mg/L	0.006	<0.00001	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	0.0000058	<0.000005
Chrysene	mg/L	0.0001	<0.00001	<0.00001
Fluoranthene	mg/L	-	0.000010	<0.00001
Fluorene	mg/L	0.012	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005
Phenanthrene	mg/L	-	<0.00002	<0.00002
Pyrene	mg/L	-	0.000012	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005
<b>Volatile Organic Compounds (VOCs)</b>				
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:**

<sup>1</sup> 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 the East WWTP
Unit		°C	mg/L	ppt	NTU	s.u.	µS/cm		m <sup>3</sup>
PE-111578 Discharge Limit <sup>1</sup>		-	-	-	-	-	-	-	1,100
Minimum Discharge Objective <sup>2</sup>		-	≥8	-	-	7.0 - 8.7	-	-	-
Station ID	Date								
WWTP-E-IN	2024-06-30 13:15	21.8	8.81	0.01	19.4	7.5	- <sup>3</sup>	N	-
WWTP-E-OUT	2024-06-30 13:23	21.8	<b><u>7.30</u></b>	0.83	0.44	<b><u>6.8</u></b>	1545	N	517
WWTP-E-IN	2024-07-01 15:35	23.1	<b><u>7.77</u></b>	0.82	3.94	7.3	1630	N	-
WWTP-E-OUT	2024-07-01 15:31	22.6	8.79	0.83	1.3	7.0	1634	N	520
WWTP-E-IN	2024-07-02 11:41	22	<b><u>7.43</u></b>	0.82	14.7	7.8	1525	N	-
WWTP-E-OUT	2024-07-02 11:58	22	<b><u>3.76</u></b>	0.83	0.67	7.9	1544	N	450
WWTP-E-IN	2024-07-03 14:50	24.1	<b><u>7.04</u></b>	0.82	5.39	8.0	1603	N	-
WWTP-E-OUT	2024-07-03 14:51	23.7	<b><u>6.77</u></b>	0.82	2.04	7.8	1593	N	430
WWTP-E-IN	2024-07-04 16:07	24.6	<b><u>6.35</u></b>	0.83	29.3	8.3	1625	N	-
WWTP-E-OUT	2024-07-04 16:18	24.6	<b><u>1.89</u></b>	0.84	0.39	8.1	1646	N	516
WWTP-E-IN	2024-07-05 15:21	25.9	<b><u>6.41</u></b>	0.83	17.7	7.9	1678	N	-
WWTP-E-OUT	2024-07-05 15:13	25	<b><u>6.49</u></b>	0.83	3.02	7.4	1656	N	489
WWTP-E-IN	2024-07-06 16:04	27.2	<b><u>6.21</u></b>	0.85	14.4	8.2	1751	N	-
WWTP-E-OUT	2024-07-06 15:56	26.2	<b><u>5.09</u></b>	0.89	3.28	7.1	1807	N	528

**Notes:**

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

<sup>2</sup> Minimum discharge objective for the WWTP effluent.

<sup>3</sup> Conductivity value for WWTP-E-IN on June 30 was not available at the time of reporting.

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 <sup>1,2</sup>		Station OUT-02
		Long Term	Short Term	VA24B5289-006 2024-06-26 13:10
<b>General Parameters</b>				
pH - Field	pH units	6.5 - 9.0	-	6.6
Specific Conductivity - Field	µS/cm	-	-	10
Temperature - Field	°C	-	-	14.0
Salinity - Field	ppt	-	-	0.01
Turbidity - Field	NTU	-	-	0.93
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	11.0
<b>Anions and Nutrients</b>				
Sulphate	mg/L	128 <sup>3</sup>	-	4.4
Chloride	mg/L	120	600	1.5
Fluoride	mg/L	-	0.40 <sup>3</sup>	<0.02
Ammonia (N-NH <sub>3</sub> )	mg/L	1.83 <sup>3</sup>	20.3 <sup>3</sup>	<0.005
Nitrite (N-NO <sub>2</sub> )	mg/L	0.02 <sup>3</sup>	0.06 <sup>3</sup>	<0.001
Nitrate (N-NO <sub>3</sub> )	mg/L	3	32.8	0.219
<b>Total Metals</b>				
Aluminum, total (T-Al)	mg/L	0.069 <sup>3</sup>	-	<b><u>0.0727</u></b>
Antimony, total (T-Sb)	mg/L	0.074	-	<0.0001
Arsenic, total (T-As)	mg/L	0.005	-	0.00014
Barium, total (T-Ba)	mg/L	1	-	0.00983
Beryllium, total (T-Be)	mg/L	0.00013	-	<0.0001
Boron, total (T-B)	mg/L	1.2	29	0.013
Cadmium, total (T-Cd)	mg/L	0.000036 <sup>3</sup>	0.00011 <sup>3</sup>	0.0000152
Chromium, total (T-Cr) <sup>5</sup>	mg/L	0.001	-	<0.0005
Cobalt, total (T-Co)	mg/L	0.001	0.11	<0.0001
Copper, total (T-Cu)	mg/L	-	-	0.00099
Iron, total (T-Fe)	mg/L	0.3	1	0.023
Lead, total (T-Pb)	mg/L	0.0034 <sup>3</sup>	0.0030 <sup>3</sup>	0.000123
Manganese, total (T-Mn)	mg/L	0.77 <sup>3</sup>	0.82 <sup>3</sup>	0.00373
Mercury, total (T-Hg)	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	0.073	46	0.00273
Nickel, total (T-Ni)	mg/L	0.025 <sup>3</sup>	-	<0.0005
Selenium, total (T-Se)	mg/L	0.001	-	<0.00005
Silver, total (T-Ag)	mg/L	0.00005 <sup>3</sup>	0.0001 <sup>3</sup>	<0.00001
Thallium, total (T-Tl)	mg/L	0.0008	-	<0.00001
Uranium, total (T-U)	mg/L	0.0085	0.033	0.000281
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	-	-
<b>Dissolved Metals</b>				
Cadmium, dissolved (D-Cd)	mg/L	0.000088 <sup>3</sup>	0.00017 <sup>3</sup>	0.0000143
Copper, dissolved (D-Cu)	mg/L	0.0002 <sup>3</sup>	0.0008 <sup>3</sup>	<b><u>0.00086</u></b>
Iron, dissolved (D-Fe)	mg/L	-	0.35	<0.01
Lead, dissolved (D-Pb)	mg/L	0.0046 <sup>3</sup>	-	0.00005
Manganese, dissolved (D-Mn)	mg/L	0.33 <sup>3</sup>	2.35 <sup>3</sup>	0.00111
Nickel, dissolved (D-Ni)	mg/L	0.0013 <sup>3</sup>	0.020 <sup>3</sup>	<0.0005
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.0378
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.016 <sup>3</sup>	0.035 <sup>3</sup>	0.0011
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>				
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	-	-
<b>Volatile Organic Compounds (VOCs)</b>				
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.

<sup>1</sup> 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.

<sup>2</sup> 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).

<sup>3</sup> 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.

<sup>4</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

<sup>5</sup> 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 <sup>1,2</sup>		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
				VA24B5289-001	VA24B5540-001	VA24B5289-002	VA24B5289-003
		Long Term	Short Term	2024-06-26 12:50	2024-06-27 11:30	2024-06-26 15:00	2024-06-26 12:00
<b>General Parameters</b>							
pH - Field	pH units	6.5 - 9.0	-	<b><u>6.4</u></b>	6.6	7.6	<b><u>6.0</u></b>
Specific Conductivity - Field	µS/cm	-	-	11	7.0	62	140
Temperature - Field	°C	-	-	10.3	9.5	13.8	14.4
Salinity - Field	ppt	-	-	0.01	0.01	0.04	0.08
Turbidity - Field	NTU	-	-	0.0	1.63	2.3	0.0
TSS	mg/L	-	-	<3	<3	<3	<3
Dissolved Oxygen - Field	mg/L	>=8	>=5	11.72	15.74	9.39	9.76
<b>Anions and Nutrients</b>							
Sulphate	mg/L	128 - 218 <sup>3</sup>	-	0.36	0.72	2.87	1.12
Chloride	mg/L	120	600	0.5	<0.5	1.03	<0.5
Fluoride	mg/L	-	0.40 - 0.89 <sup>3</sup>	<0.02	<0.02	0.039	<0.02
Ammonia (N-NH <sub>3</sub> )	mg/L	1.78 - 1.86 <sup>3</sup>	10.9 - 25.5 <sup>3</sup>	<0.005	<0.005	<0.005	<0.005
Nitrite (N-NO <sub>2</sub> )	mg/L	0.02 <sup>3</sup>	0.06 <sup>3</sup>	<0.001	<0.001	<0.001	<0.001
Nitrate (N-NO <sub>3</sub> )	mg/L	3	32.8	0.0222	0.0181	0.0390	0.0159
<b>Total Metals</b>							
Aluminum, total (T-Al)	mg/L	0.0085 - 0.140 <sup>3</sup>	-	<b><u>0.126</u></b>	<b><u>0.0902</u></b>	0.0517	<b><u>0.0446</u></b>
Antimony, total (T-Sb)	mg/L	0.074	-	<0.0001	<0.0001	0.00012	<0.0001
Arsenic, total (T-As)	mg/L	0.005	-	0.00013	<0.0001	0.00014	<0.0001
Barium, total (T-Ba)	mg/L	1	-	0.0019	0.00136	0.0079	0.00143
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 - 0.000063 <sup>3</sup>	0.00011 - 0.00067 <sup>3</sup>	<0.000005	<0.000005	0.0000135	<0.000005
Chromium, total (T-Cr) <sup>5</sup>	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	<0.0005	0.00089	<0.0005
Iron, total (T-Fe)	mg/L	0.3	1	0.041	0.015	0.094	<0.01
Lead, total (T-Pb)	mg/L	0.0034 - 0.0041 <sup>3</sup>	0.0030 - 0.020 <sup>3</sup>	0.000069	<0.00005	0.000073	<0.00005
Manganese, total (T-Mn)	mg/L	0.77 <sup>3</sup>	0.82 - 0.90 <sup>3</sup>	0.001	0.00053	0.00492	0.00029
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	0.000242	0.000267	0.000967	0.00034
Nickel, total (T-Ni)	mg/L	-	-	<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 <sup>3</sup>	0.0001 <sup>3</sup>	<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	0.000586	0.000182	0.000077	0.000129
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
<b>Dissolved Metals</b>							
Cadmium, dissolved (D-Cd)	mg/L	0.000018 - 0.000093 <sup>3</sup>	0.000038 - 0.00019 <sup>3</sup>	<0.000005	0.0000079	0.0000068	<0.000005
Copper, dissolved (D-Cu)	mg/L	0.00020 - 0.00060 <sup>3</sup>	0.00020 - 0.0036 <sup>3</sup>	<b><u>0.00030</u></b>	<0.0002	<b><u>0.00070</u></b>	<b><u>0.00022</u></b>
Iron, dissolved (D-Fe)	mg/L	-	0.35	0.023	<0.01	0.018	<0.01
Lead, dissolved (D-Pb)	mg/L	0.0019 - 0.0046 <sup>3</sup>	-	<0.00005	<0.00005	<0.00005	<0.00005
Manganese, dissolved (D-Mn)	mg/L	0.29 - 0.35 <sup>3</sup>	1.97 - 2.50 <sup>3</sup>	0.00037	0.00021	0.0023	0.00026
Nickel, dissolved (D-Ni)	mg/L	0.00086 - 0.0016 <sup>3</sup>	0.014 - 0.023 <sup>3</sup>	<0.0005	<0.0005	<0.0005	<0.0005
Strontium, dissolved (D-Sr)	mg/L	2.5	-	0.00306	0.00313	0.0373	0.00385
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Zinc, dissolved (D-Zn)	mg/L	0.0075 - 0.014 <sup>3</sup>	0.014 - 0.036 <sup>3</sup>	<0.001	<0.001	0.0014	<0.001
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>							
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
<b>Volatile Organic Compounds (VOCs)</b>							
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.

<sup>1</sup> 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.

<sup>2</sup> 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).

<sup>3</sup> 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.

<sup>4</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

<sup>5</sup> 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 <sup>1,2</sup>		Station SW-03
				Mill Creek Estuary
				SW-03
		Long Term	Short Term	VA24B5540-002 2024-06-26 12:00
<b>General Parameters</b>				
pH - Field	pH units	7.0 - 8.7	-	<u><b>6.8</b></u>
Specific Conductivity - Field	µS/cm	-	-	10
Temperature - Field	°C	-	-	9.8
Salinity - Field	ppt	-	-	0.01
Turbidity - Field	NTU	-	-	1.42
TSS	mg/L	-	-	<3
Dissolved Oxygen - Field	mg/L	-	-	12.12
<b>Anions and Nutrients</b>				
Sulphate	mg/L	-	-	0.84
Chloride	mg/L	-	-	<0.5
Fluoride	mg/L	-	-	<0.02
Ammonia (N-NH <sub>3</sub> )	mg/L	-	-	<0.005
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	<0.001
Nitrate (N-NO <sub>3</sub> )	mg/L	-	-	0.0189
<b>Total Metals</b>				
Aluminum, total (T-Al)	mg/L	-	-	0.153
Antimony, total (T-Sb)	mg/L	-	-	<0.0001
Arsenic, total (T-As)	mg/L	-	-	0.0001
Barium, total (T-Ba)	mg/L	-	-	0.00191
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	-	-	0.067
Lead, total (T-Pb)	mg/L	0.002	0.14	0.000139
Manganese, total (T-Mn)	mg/L	-	-	0.00172
Mercury, total (T-Hg) <sup>3</sup>	mg/L	0.00002	-	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.000338
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	-	-	0.000189
Vanadium, total (T-V)	mg/L	-	-	<0.0005
Zinc, total (T-Zn)	mg/L	-	-	<0.003
Hexavalent Chromium, total	mg/L	-	-	<0.0005
<b>Dissolved Metals</b>				
Cadmium, dissolved (D-Cd)	mg/L	-	-	<0.000005
Copper, dissolved (D-Cu)	mg/L	-	-	0.00021
Iron, dissolved (D-Fe)	mg/L	-	-	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	0.00031
Strontium, dissolved (D-Sr)	mg/L	-	-	0.00403
Vanadium, dissolved (D-V)	mg/L	-	-	<0.0005
Zinc, dissolved (D-Zn)	mg/L	-	-	<0.001
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>				
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
<b>Volatile Organic Compounds (VOCs)</b>				
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.

<sup>1</sup> 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.

<sup>2</sup> Canadian Water Quality Guideline for the protection of estuarine aquatic life (CCME, 2021).

<sup>3</sup> 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 <sup>1,2</sup>		Station IDZ-E1	Station IDZ-E2	Reference Station WQR1	Station IDZ-E1		
				0.5 m Below Surface	0.5 m Below Surface	0.5 m Below Surface	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
				IDZ-E1-0.5	IDZ-E2-0.5	WQR1-0.5	IDZ-E1-0.5	IDZ-E1-2m	IDZ-E1-SF
				VA24B5880-001	VA24B5880-002	VA24B5880-003	VA24B5882-001	VA24B5882-002	VA24B5882-003
		Long Term	Short Term	2024-07-02 14:20	2024-07-02 14:10	2024-07-02 14:27	2024-07-03 10:47	2024-07-03 10:50	2024-07-03 10:53
<b>General Parameters</b>									
pH - Field	pH units	7.0 - 8.7	-	-	-	-	8.3	7.8	8.1
Specific Conductivity - Field	µS/cm	-	-	-	-	-	1399	5016	28316
Temperature - Field	°C	-	-	-	-	-	13.3	12.8	13.2
Salinity - Field	ppt	Narrative <sup>3</sup>	-	-	-	-	0.92	3.6	23.14
Turbidity - Field	NTU	Narrative <sup>3</sup>	Narrative <sup>3</sup>	-	-	-	25.8	18.0	2.62
TSS	mg/L	Narrative <sup>3</sup>	Narrative <sup>3</sup>	17.9	12.5	14.1	18.1	18.0	2.7
Dissolved Oxygen - Field	mg/L	>=8	-	-	-	-	10.94	9.87	9.16
<b>Anions and Nutrients</b>									
Sulphate	mg/L	-	-	-	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-	-	-	-
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>4</sup>	Variable <sup>4</sup>	-	-	-	-	-	-
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	-	-	-	-	-
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	339	-	-	-	-	-	-
<b>Total Metals</b>									
Aluminum, total (T-Al)	mg/L	-	-	0.925	0.816	0.929	0.534	0.33	0.0283
Antimony, total (T-Sb)	mg/L	-	0.27 <sup>5</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic, total (T-As)	mg/L	0.0125	0.0125	<0.0004	<0.0004	<0.0004	<0.0004	0.00062	0.00309
Barium, total (T-Ba)	mg/L	-	-	0.0184	0.0177	0.0193	0.015	0.013	0.008
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	-	<0.3	<0.3	<0.3	<0.3	0.50	<b>2.49</b>
Cadmium, total (T-Cd)	mg/L	0.00012	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00005
Chromium, total (T-Cr)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	0.000359	0.000328	0.000357	0.000226	0.000162	0.000068
Copper, total (T-Cu)	mg/L	0.002	0.003	<b>0.00292</b>	0.00164	0.00173	0.00125	0.00093	0.00065
Iron, total (T-Fe)	mg/L	-	-	0.741	0.663	0.748	0.463	0.314	0.024
Lead, total (T-Pb)	mg/L	0.002	0.14	0.00014	0.00013	0.00013	<0.0001	<0.0001	<0.0001
Manganese, total (T-Mn)	mg/L	-	-	0.022	0.0195	0.0222	0.0158	0.0126	0.00236
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	-	-	0.00064	0.00058	0.00058	0.00049	0.00137	0.00787
Nickel, total (T-Ni)	mg/L	0.0083	-	0.00052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
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	-	-	0.000138	0.000135	0.000142	0.000087	0.000379	0.00242
Vanadium, total (T-V)	mg/L	0.005 <sup>7</sup>	-	0.00215	0.00191	0.00215	0.00142	0.00118	0.00112
Zinc, total (T-Zn)	mg/L	0.01	0.055	<0.003	0.0032	<0.003	<0.003	<0.003	<0.003
Hexavalent Chromium, total	mg/L	0.0015	-	-	-	-	-	-	-
<b>Dissolved Metals</b>									
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	-	-	-	-	-
Copper, dissolved (D-Cu)	mg/L	-	-	-	-	-	-	-	-
Iron, dissolved (D-Fe)	mg/L	-	-	-	-	-	-	-	-
Lead, dissolved (D-Pb)	mg/L	-	-	-	-	-	-	-	-
Manganese, dissolved (D-Mn)	mg/L	-	-	-	-	-	-	-	-
Strontium, dissolved (D-Sr)	mg/L	-	-	-	-	-	-	-	-
Vanadium, dissolved (D-V)	mg/L	-	-	-	-	-	-	-	-
Zinc, dissolved (D-Zn)	mg/L	-	-	-	-	-	-	-	-
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>									
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-
Acridine	mg/L	-	-	-	-	-	-	-	-
Anthracene	mg/L	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-	-	-	-	-	-
Chrysene	mg/L	0.0001	-	-	-	-	-	-	-
Fluoranthene	mg/L	-	-	-	-	-	-	-	-
Fluorene	mg/L	0.012	-	-	-	-	-	-	-
1-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
2-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-
Phenanthrene	mg/L	-	-	-	-	-	-	-	-
Pyrene	mg/L	-	-	-	-	-	-	-	-
Quinoline	mg/L	-	-	-	-	-	-	-	-
<b>Volatile Organic Compounds (VOCs)</b>									
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.

<sup>1</sup> 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.

<sup>2</sup> Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

<sup>3</sup> 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.

<sup>4</sup> 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).

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

<sup>6</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

<sup>7</sup> Federal Water Quality Guideline for Vanadium (Environment and Climate Change Canada).

<sup>8</sup> The recorded field salinity measurements for IDZ-2 do not correlate with conductivity measurements and are suspected to be erroneous.

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 <sup>1,2</sup>		Station IDZ-E2			Station WQR1		
				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-E2-0.5	IDZ-E2-2m	IDZ-E2-SF	WQR1-0.5	WQR1-2m	WQR1-SF
				VA24B5882-004	VA24B5882-005	VA24B5882-006	VA24B5882-007	VA24B5882-008	VA24B5882-009
		Long Term	Short Term	2024-07-03 10:55	2024-07-03 10:57	2024-07-03 11:00	2024-07-03 10:20	2024-07-03 10:23	2024-07-03 10:26
<b>General Parameters</b>									
pH - Field	pH units	7.0 - 8.7	-	8.2	8.1	8.1	7.5	7.4	8.2
Specific Conductivity - Field	µS/cm	-	-	1976	7572	28686	2767	2439	26687
Temperature - Field	°C	-	-	13.1	13.1	12.8	13.6	13.5	13.4
Salinity - Field	ppt	Narrative <sup>3</sup>	-	1.33	5.55	23.70	1.87	1.64	21.58
Turbidity - Field	NTU	Narrative <sup>3</sup>	Narrative <sup>3</sup>	29.2	17.3	3.48	23.7	18.1	2.41
TSS	mg/L	Narrative <sup>3</sup>	Narrative <sup>3</sup>	17.4	15.6	4.0	17.6	16.3	4.6
Dissolved Oxygen - Field	mg/L	>=8	-	9.61	9.79	8.55	11.50	10.87	8.67
<b>Anions and Nutrients</b>									
Sulphate	mg/L	-	-	-	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-	-	-	-
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>4</sup>	Variable <sup>4</sup>	-	-	-	-	-	-
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	-	-	-	-	-
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	339	-	-	-	-	-	-
<b>Total Metals</b>									
Aluminum, total (T-Al)	mg/L	-	-	0.533	0.31	0.0168	0.37	0.41	0.0746
Antimony, total (T-Sb)	mg/L	-	0.27 <sup>5</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic, total (T-As)	mg/L	0.0125	0.0125	0.00047	0.00099	0.00316	<0.0004	<0.0004	0.00305
Barium, total (T-Ba)	mg/L	-	-	0.0153	0.0123	0.0086	0.0138	0.014	0.0113
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	-	<0.3	0.67	<b>2.68</b>	0.30	<0.3	<b>2.48</b>
Cadmium, total (T-Cd)	mg/L	0.00012	-	<0.00002	<0.00002	0.000051	<0.00002	<0.00002	0.000056
Chromium, total (T-Cr)	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	0.000232	0.000168	0.000062	0.00017	0.00018	0.000087
Copper, total (T-Cu)	mg/L	0.002	0.003	0.0012	0.00081	<0.0005	0.00109	0.00117	0.00059
Iron, total (T-Fe)	mg/L	-	-	0.461	0.291	0.012	0.33	0.354	0.081
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	-	-	0.0159	0.011	0.00201	0.0123	0.0128	0.00423
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	-	-	0.00049	0.00187	0.00783	0.00069	0.00071	0.00756
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	<0.0005	<0.0005	<0.0005	<0.0005
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	-	-	0.000081	0.000539	0.00249	0.000134	0.000148	0.00247
Vanadium, total (T-V)	mg/L	0.005 <sup>7</sup>	-	0.00145	0.00113	0.00109	0.00111	0.00122	0.00124
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	-	-	-	-	-	-	-
<b>Dissolved Metals</b>									
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	-	-	-	-	-
Copper, dissolved (D-Cu)	mg/L	-	-	-	-	-	-	-	-
Iron, dissolved (D-Fe)	mg/L	-	-	-	-	-	-	-	-
Lead, dissolved (D-Pb)	mg/L	-	-	-	-	-	-	-	-
Manganese, dissolved (D-Mn)	mg/L	-	-	-	-	-	-	-	-
Strontium, dissolved (D-Sr)	mg/L	-	-	-	-	-	-	-	-
Vanadium, dissolved (D-V)	mg/L	-	-	-	-	-	-	-	-
Zinc, dissolved (D-Zn)	mg/L	-	-	-	-	-	-	-	-
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>									
Acenaphthene	mg/L	0.006	-	-	-	-	-	-	-
Acridine	mg/L	-	-	-	-	-	-	-	-
Anthracene	mg/L	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/L	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-	-	-	-	-	-
Chrysene	mg/L	0.0001	-	-	-	-	-	-	-
Fluoranthene	mg/L	-	-	-	-	-	-	-	-
Fluorene	mg/L	0.012	-	-	-	-	-	-	-
1-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
2-methylnaphthalene	mg/L	0.001	-	-	-	-	-	-	-
Naphthalene	mg/L	0.001	-	-	-	-	-	-	-
Phenanthrene	mg/L	-	-	-	-	-	-	-	-
Pyrene	mg/L	-	-	-	-	-	-	-	-
Quinoline	mg/L	-	-	-	-	-	-	-	-
<b>Volatile Organic Compounds (VOCs)</b>									
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.

<sup>1</sup> 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.

<sup>2</sup> Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

<sup>3</sup> 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.

<sup>4</sup> 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).

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

<sup>6</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

<sup>7</sup> 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-3:  
Summary of Marine Water Quality Results Received at the Time of Reporting**

Parameter	Unit	Lowest Applicable Guideline <sup>1,2</sup>		Reference Station WQR2		
				0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
				WQR2-0.5	WQR2-2m	WQR2-SF
				VA24B5882-010 2024-07-03 12:34	VA24B5882-011 2024-07-03 12:36	VA24B5882-012 2024-07-03 12:50
		Long Term	Short Term			
<b>General Parameters</b>						
pH - Field	pH units	7.0 - 8.7	-	7.0	7.1	8.0
Conductivity - Field	µS/cm	-	-	1336	1280	28112
Temperature - Field	°C	-	-	14.6	14	13.4
Salinity - Field	ppt	Narrative <sup>3</sup>	-	0.85	0.82	22.81
Turbidity - Field	NTU	Narrative <sup>3</sup>	Narrative <sup>3</sup>	25.9	24.4	2.37
TSS	mg/L	Narrative <sup>3</sup>	Narrative <sup>3</sup>	15.9	19.7	<2.1
Dissolved Oxygen - Field	mg/L	>=8	-	10.84	10.62	8.54
<b>Anions and Nutrients</b>						
Sulphate	mg/L	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-
Fluoride	mg/L	-	1.5	-	-	-
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>4</sup>	Variable <sup>4</sup>	-	-	-
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	-	-
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	339	-	-	-
<b>Total Metals</b>						
Aluminum, total (T-Al)	mg/L	-	-	0.469	0.49	0.0223
Antimony, total (T-Sb)	mg/L	-	0.27 <sup>5</sup>	<0.001	<0.001	<0.001
Arsenic, total (T-As)	mg/L	0.0125	0.0125	0.00042	<0.0004	0.00304
Barium, total (T-Ba)	mg/L	-	-	0.0149	0.0149	0.0075
Beryllium, total (T-Be)	mg/L	0.1	-	<0.0005	<0.0005	<0.0005
Boron, total (T-B)	mg/L	1.2	-	<0.3	<0.3	<b>2.77</b>
Cadmium, total (T-Cd)	mg/L	0.00012	-	<0.00002	<0.00002	0.00005
Chromium, total (T-Cr)	mg/L	-	-	<0.0005	<0.0005	<0.0005
Cobalt, total (T-Co)	mg/L	-	-	0.000214	0.000217	0.000058
Copper, total (T-Cu)	mg/L	0.002	0.003	0.00131	0.00118	<0.0005
Iron, total (T-Fe)	mg/L	-	-	0.412	0.434	0.018
Lead, total (T-Pb)	mg/L	0.002	0.14	<0.0001	<0.0001	<0.0001
Manganese, total (T-Mn)	mg/L	-	-	0.0144	0.0148	0.0019
Mercury, total (T-Hg) <sup>6</sup>	mg/L	0.000016	-	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	0.00055	0.00048	0.00668
Nickel, total (T-Ni)	mg/L	0.0083	-	<0.0005	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	<0.0005	<0.0005	<0.0005
Silver, total (T-Ag)	mg/L	0.0015	0.003	<0.0001	<0.0001	<0.0001
Thallium, total (T-Tl)	mg/L	-	-	<0.00005	<0.00005	<0.00005
Uranium, total (T-U)	mg/L	-	-	0.000113	0.000112	0.00209
Vanadium, total (T-V)	mg/L	0.005 <sup>7</sup>	-	0.00128	0.00133	0.00098
Zinc, total (T-Zn)	mg/L	0.01	0.055	<0.003	<0.003	<0.003
Hexavalent Chromium, total	mg/L	0.0015	-	-	-	-
<b>Dissolved Metals</b>						
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	-	-
Copper, dissolved (D-Cu)	mg/L	-	-	-	-	-
Iron, dissolved (D-Fe)	mg/L	-	-	-	-	-
Lead, dissolved (D-Pb)	mg/L	-	-	-	-	-
Manganese, dissolved (D-Mn)	mg/L	-	-	-	-	-
Strontium, dissolved (D-Sr)	mg/L	-	-	-	-	-
Vanadium, dissolved (D-V)	mg/L	-	-	-	-	-
Zinc, dissolved (D-Zn)	mg/L	-	-	-	-	-
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	mg/L	0.006	-	-	-	-
Acridine	mg/L	-	-	-	-	-
Anthracene	mg/L	-	-	-	-	-
Benz(a)anthracene	mg/L	-	-	-	-	-
Benzo(a)pyrene	mg/L	0.00001	-	-	-	-
Chrysene	mg/L	0.0001	-	-	-	-
Fluoranthene	mg/L	-	-	-	-	-
Fluorene	mg/L	0.012	-	-	-	-
1-methylnaphthalene	mg/L	0.001	-	-	-	-
2-methylnaphthalene	mg/L	0.001	-	-	-	-
Naphthalene	mg/L	0.001	-	-	-	-
Phenanthrene	mg/L	-	-	-	-	-
Pyrene	mg/L	-	-	-	-	-
Quinoline	mg/L	-	-	-	-	-
<b>Volatile Organic Compounds (VOCs)</b>						
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.

<sup>1</sup> 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.

<sup>2</sup> Canadian Water Quality Guideline for the protection of marine aquatic life (CCME, 2021).

<sup>3</sup> 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.

<sup>4</sup> 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).

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

<sup>6</sup> When MeHg ≤ 0.5% of total Hg, BC WQG = 0.00002 mg/L.

<sup>7</sup> 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.