

## TECHNICAL MEMORANDUM

---

**To:** Ashleigh Crompton, Mike Champion, Jackie Boruch and Ryan Schucroft (Woodfibre LNG)      **Date:** 21 June 2024

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

**Subject:** PE-111578 Weekly Discharge and Compliance Report #18 for June 9 – 15

---

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 #18) was prepared by Lorax Environmental and summarizes monitoring conducted the week of June 9 – 15 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. Figures referenced in the report discussion are presented after Section 5. Report #18 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 9 – 15 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 schedule for completion of the pond outfall structure is being revised. The West WWTP has been assembled and commissioning of the WWTP was completed during the monitoring period (June 9 – 15). Pilot trials are expected to commence in the coming weeks.

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.

The weather was variable during the monitoring period (June 9 – 15) with precipitation recorded June 11 and June 14 – 15 at the on-site weather station (<10 mm per day). 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
2024/06/09	0.0	21.0	13.9	Sunny
2024/06/10	0.0	19.9	13.5	Sunny
2024/06/11	8.4	17.0	11.4	Overcast
2024/06/12	0.8	18.2	9.5	Partly Cloudy
2024/06/13	0.0	19.2	8.7	Sunny
2024/06/14	1.7	15.6	10.9	Partly Cloudy
2024/06/15	6.8	11.7	8.8	Overcast

Pilot testing of the East WWTP continued during the monitoring period (June 9 – 15). Contaminated and potentially contaminated contact waters from excavations within the East Catchment (Excavation Areas 1100, 1200, 1300) and the West Catchment (Excavation Areas 4100 and 4200) were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond and water transferred from the West Sedimentation Pond. The contact water source areas are shown in Figure 2 and Figure 3 in Appendix A. A total of 3,598 m<sup>3</sup> of treated WWTP effluent was discharged to the East Sedimentation Pond during the reporting period (June 9 – 15). Daily WWTP effluent flows are provided in Appendix C (Table C-3).

During the monitoring period (June 9 – 15), the only contact water received by the East Sedimentation Pond was WWTP effluent, each day. There were no discharges from the East and West Sedimentation Ponds during the monitoring period (June 9 – 15), except on June 9. The East Sedimentation Pond discharged 473 m<sup>3</sup> between 18:58 June 8 to 01:30 June 9, and the discharge volume is reported as a June 9 discharge. The water quality results for the sample collected June 8, and associated with the discharge on June 9 were reported in weekly report #17. Daily effluent flows are provided in Appendix B (Table B-3). Photographs of the ponds are included in Appendix A (Figure 4 and Figure 5).

## 2. Monitoring Summary

The PE-111578 authorized works were under construction during the June 9 – 15 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 IDZ-E1, IDZ-E2, WQR1, WQR2, WWTP-E-IN, WWTP-E-OUT, and SP-E-NE were monitored during the monitoring period (June 9 – 15). Sampling dates and parameters tested are summarized in Table 1.

Overall, the PE-111578 monitoring requirements that were applicable during the monitoring period (June 9 – 15) were met. However, field parameters nor analytical samples were not collected at station SP-E-IN-2. The East Sedimentation 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 during the monitoring period. Daily field parameters were not collected from the influent and effluent stations of the East WWTP (WWTP-E-IN and WWTP-E-OUT, respectively) on June 12 as the East WWTP was periodically inactive throughout the day due to maintenance, and was not active at the time of monitoring.

**Table 2: Summary of PE-111578 monitoring samples collected June 9 – 15.**

Sampling Date	Sample	Description	Parameters Tested	Monitoring Frequency
June 9, 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		
June 10, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans, Oil and Grease and Glycols.	D, W <sub>1</sub> , P
	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, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Dioxins and Furans (IDZ samples only), and Methyl Mercury.	M
	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.			
June 11, 2024	WWTP-E-OUT	East WWTP effluent	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
	WWTP-E-IN	East WWTP influent	Field Parameters.	D
June 12, 2024	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	D
	SP-E-NE <sup>1</sup>	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
June 13, 2024	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent	Field and Physical Parameters, Total, Dissolved and Speciated Metals, EPHs and PAHs.	D, P
June 14, 2024	SP-E-NE <sup>1</sup>	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-OUT	East WWTP effluent		
	WWTP-E-IN	East WWTP influent		
June 15, 2024	SP-E-NE <sup>1</sup>	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-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 and items outside the screening criteria are also summarized in the Section 4 tracking table (Table 5).

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 useful 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 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 for the monitoring period (June 9 – 15) that were available at the time of reporting are listed below in Table 3. Results for dioxins and furans are pending for the following samples and will be included in future weekly reports when available:

- SP-E-NE collected June 10 (dioxins and furans)
- WWTP-E-IN and WWTP-E-OUT collected June 10 (dioxins and furans)
- IDZ-E1 and IDZ-E2 collected June 10 (dioxins and furans)

Methylmercury analytical results for samples collected May 14 and 16 and described in Weekly Report #14 and for samples collected June 4 and 8 described in Weekly Report #17 were available at the time of reporting (Table 3).

**Table 3: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #18.**

Sample	Description	Sampling Date	Parameters Reported
SW-02	Upper Reach of Mill Creek (upstream of the third bridge)	May 14, 2024	Methylmercury
SW-03	Lower Reach of Mill Creek (near the mouth, in the estuarine zone)		
SW-07	Upstream Mill Creek (at the diversion inlet)		
OUT-02	Non-Contact Water Diversion Ditch Outlet	May 16, 2024	Methylmercury
SW-01	Lower Reach of Woodfibre Creek (near the mouth)		
SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	June 4, 2024	Methylmercury
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.		
SP-E-OUT	East Sedimentation Pond effluent (compliance point)	June 8, 2024	Methylmercury
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	June 10, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, and VOCs.
WWTP-E-OUT	East WWTP effluent		
WWTP-E-IN	East WWTP influent		Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs, VOCs, and Methylmercury.
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface		
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.		
WWTP-E-OUT	East WWTP effluent	June 11, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	June 13, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.
WWTP-E-OUT	East WWTP effluent		
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	June 14, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.
WWTP-E-OUT	East WWTP effluent		
WWTP-E-IN	East WWTP influent	June 15, 2024	Field and Physical Parameters, Total, Dissolved Metals, Hexavalent Chromium, and PAHs.
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality		
WWTP-E-OUT	East WWTP effluent		
WWTP-E-IN	East WWTP influent		

### **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 9 – 15), the East Sedimentation Pond received East WWTP effluent each day. The sedimentation pond did not receive contact water during the monitoring period; therefore, field measurements at station SP-E-IN-2 were not collected. The East Sedimentation Pond discharged overnight from June 8 until 01:30 on June 9. Field measurements and analytical results that represents the June 8 discharge event is described in Report #17.

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 9 – 14 when values were below the lower limit of the WQG (8.0 mg/L). However, the pond did not discharge during the day June 9 through June 14. Low dissolved oxygen values at the in-pond effluent station correlate with low dissolved oxygen values at the effluent station of the East WWTP (WWTP-E-OUT) June 9 – 14.

The in-pond effluent samples (station SP-E-NE) collected June 10 proximal to the effluent intake (Figure 1) were tested for all parameters under PE-111578 except methylmercury (Table 2). In-pond effluent samples were also collected June 13, 14, and 15 and tested for physical and general (June 13 only) parameters, total and dissolved metals, and PAHs. The in-pond effluent samples met PE-111578 discharge limits for the tested parameters and met WQGs for parameters without discharge limits except dissolved oxygen from the samples collected June 10 (5.97 mg/L), June 13 (6.82 mg/L), and June 14 (7.00 mg/L) which were below the lower limit of the WQG (8.0 mg/L). The pond did not discharge on June 9 – 15 and therefore the sample results are not considered discharge limit exceedances.

Methylmercury analytical results were available at the time of reporting for the June 8 sample discussed in Weekly Report #17 for the East Sedimentation Pond discharge point (SP-E-OUT). The methylmercury concentration at SP-E-OUT was 0.000040 µg/L on June 8.

### **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 4 for parameter concentrations that do not meet MDOs.

The East WWTP discharged treated effluent to the East Sedimentation Pond each day of the monitoring period (June 9 – 15). Field measurements were collected each day at the influent and effluent stations, WWTP-E-IN and WWTP-E-OUT, respectively, except on June 12 when the East WWTP was periodically inactive throughout the day for maintenance and was not active when field measurements were being collected. Analytical samples were collected from the influent and effluent stations on June 10, 14, and 15. Additional analytical samples were collected from the effluent station on June 11 and 13 and were measured for physical and general (June 13 only) parameters, total and dissolved metals, hexavalent chromium, and PAHs.

Field measurements of pH at East WWTP influent (station WWTP-E-IN) collected during the monitoring period (June 9 – 15) ranged from pH 6.9 to 7.6 and were generally within the MDO (pH 7.0 – 8.7); however, dissolved oxygen was generally below the minimum MDO value (8 mg/L), and ranged from 2.37 to 8.42 mg/L. Low dissolved oxygen levels are suspected to originate from anoxic groundwaters that accumulate in excavated areas and are directed to the East WWTP for treatment. The influent turbidity readings ranged from 23.0 to 35.2 NTU.

Field pH, turbidity and dissolved oxygen in East WWTP effluent samples (station WWTP-E-OUT) ranged from pH 6.1 to 7.4, 0 to 8.33 NTU and 2.35 to 10.33 mg/L, respectively (Appendix C, Table C-3). The effluent field measurements met the MDOs, except pH on June 9, 11, and 14 (pH 6.10, 6.20, and 6.96, respectively) and dissolved oxygen on June 9, 10, 11, 14 (2.35 – 7.93 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. Deviations from MDOs are expected to occasionally occur during the East WWTP pilot trial. Effluent turbidity concentrations ranged from 4.06 to 8.33 NTU from June 9 to 11. The turbidity levels were below 1 NTU from June 12 to June 15 following maintenance of the WWTP system.

Analytical samples of East WWTP effluent (station WWTP-E-OUT) were collected June 10, 11, 13, 14, and 15 and the results met MDOs, except for total copper, total lead, total nickel, total vanadium, and total zinc. The total copper concentrations were 3.8 and 1.1 times greater than the MDO (0.002 mg/L) in the samples from WWTP-E-OUT collected on June 10 (0.00750 mg/L), and June 15 (0.00219 mg/L), respectively, due to both soluble and particle-bound forms of the metal. The total lead and total nickel concentrations were, respectively, 1.2 and 1.8 times greater than the MDOs (0.002 mg/L for lead and 0.0083 mg/L for nickel) in the sample from WWTP-E-OUT collected on June 10 (0.00238 mg/L total lead and 0.0151 mg/L total nickel) and are attributed to soluble and particle-bound forms of lead and to soluble forms of nickel. The total

vanadium concentrations were 1.1 to 1.2 times greater than the MDO (0.005 mg/L) in the samples from WWTP-E-OUT collected June 10 – 15 and are attributed primarily to the dissolved forms of the metal. The total zinc concentrations were 1.0 to 4.8 times greater than the MDO (0.01 mg/L) in the samples from WWTP-E-OUT collected on June 10 – 13 and June 15. Total zinc concentrations are primarily attributed to the soluble forms of the metal present in the samples.

**Table 4:  
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	6	3	Field pH was below the lower limit of the MDO on June 9 (pH 6.10), June 11 (pH 6.20), and June 14 (pH 6.96). Process adjustments are underway and occasional deviations from MDOs may occur during the pilot period. This item remains open.
Field Dissolved Oxygen (DO)	mg/L	>=8	6	4	Field DO was below the lower limit MDO for DO in the field measurement collected from WWTP-E-OUT on June 9 (2.35 mg/L), June 10 (5.92 mg/L), June 11 (7.93 mg/L), and June 14 (4.68 mg/L). Low DO values are suspected to originate from anoxic groundwater that accumulates in excavation areas. This item remains open.
Total Copper	mg/L	0.002	5	2	The total copper concentrations were 3.8 and 1.1 times greater than the MDO in the samples from WWTP-E-OUT collected on June 10 (0.00750 mg/L) and June 15 (0.00219 mg/L), respectively. Additional process adjustments are under development to improve the removal of copper. This item remains open.
Total Lead	mg/L	0.002	5	1	The total lead concentration was 1.2 times greater than the MDO in the sample from WWTP-E-OUT collected on June 10 (0.00238 mg/L). Additional process adjustments are under development to improve the removal of lead. This item remains open.
Total Nickel	mg/L	0.0083	5	1	The total nickel concentration was 1.8 times greater than the MDO in the sample from WWTP-E-OUT collected on June 10 (0.0151 mg/L). Additional process adjustments are under development to improve the removal of nickel. This item remains open.
Total Vanadium	mg/L	0.005	5	5	The total vanadium concentrations were 1.1 to 1.2 times greater than the MDO in the samples from WWTP-E-OUT collected June 10 – 15. Additional process adjustments are under development to improve the removal of vanadium. This item remains open.
Total Zinc	mg/L	0.01	5	4	The total zinc concentrations were 1.0 to 4.8 times greater than the MDO in the samples from WWTP-E-OUT collected June 10 – 13 and 15. Additional process adjustments are under development to improve the removal of zinc. This item remains open.

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.

Methylmercury analytical results were available at the time of reporting for the May 16 sample discussed in Weekly Report #14 for non-contact water diversion ditch outlet station OUT-02. The methylmercury concentration was 0.000022 µg/L and is within the range observed in the pre-construction baseline monitoring program for freshwater creeks within the CPA.

### **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.

Methylmercury analytical results were available at the time of reporting for the May 14 and 16 samples discussed in Weekly Report #14 for freshwater and estuarine water receiving environment stations. Methylmercury concentrations were <0.000020 µg/L in the freshwater samples from Woodfibre Creek (SW-01) and Mill Creek (SW-02 and SW-07) and 0.000022 µg/L in the freshwater sample from East Creek (SW-04). The methylmercury concentration in the estuarine lower reach of Mill Creek (SW-03) was <0.000020 µg/L. Methylmercury concentrations are within the ranges observed in the pre-construction baseline monitoring program.

### **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 (Table G-1 to G-6).

Analytical results for the June 10 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 dissolved oxygen, total boron and total copper in one sample. Dissolved oxygen concentrations were below the lower limit of the WQG (8 mg/L) in samples collected from 2 m above the seafloor at IDZ-E1 (6.77 mg/L) and reference station WQR2 (6.44 mg/L). The concentrations of total boron in the samples ranged from <0.3 to 3.99 mg/L and were above the WQG (1.2 mg/L) in all samples collected 2 m above the seafloor. Total copper was

above the long-term WQG (0.002 mg/L) in one sample collected from 0.5 m below surface at IDZ-E1 (0.00205 mg/L). Total copper concentrations ranged from 0.00055 to 0.00205 mg/L at IDZ-E1, IDZ-E2, WQR1, and WQR2. The reported concentrations of dissolved oxygen, 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.

Methylmercury analytical results were available at the time of reporting for the June 4 samples discussed in Weekly Report #17 for marine receiving environment stations IDZ-E1, IDZ-E2, and WQR1. Methylmercury concentrations were <0.000020 µg/L in all marine receiving environment samples. Methylmercury results for the June 10 marine water monitoring at stations IDZ-E1, IDZ-E2, WQR1, and WQR2 ranged from <0.000020 to 0.000026 µg/L. The methylmercury values observed in the marine water samples are within the concentrations ranges observed in the pre-construction baseline monitoring program.

#### **4. Quality Control**

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 5). 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 in Table 5, and open items from the exceedance tables in section 3 will be carried forward in future reports until they are closed.

**Table 5: Weekly Report QC Evaluations and Ongoing Items**

QC Procedure	Observation	Investigation/Resolution
<b>Reporting Period (June 9 – 15, Report #18)</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.	This review is underway and will evaluate if any samples/parameters were omitted from the PE-111578 routine and high-frequency monitoring programs that have been conducted since April 2024. It is expected to be completed for the next weekly report.
<b>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 July. This item remains open.
<b>Field QC</b>	A labelling error caused incorrect reporting of total and dissolved metal results for the receiving environment IDZ-E1-2m and IDZ-E1-SF samples collected June 10.	The total and dissolved bottles for the June 10 IDZ-E1-2m and IDZ-E1-SF samples were incorrectly labelled in the field. This error was carried forward in the laboratory report and resulted in suspected erroneous results reported for total and dissolved metals in these samples. The results were flagged as suspect because the reported results do not match baseline trends at those depths. The report will be reissued by the laboratory. The results presented in Appendix G are correctly reported. Labelling procedures will be reviewed with field staff and laboratory staff. Procedures will be updated for both groups, as appropriate, to minimize field labelling errors. This item is closed.
<b>Ongoing Items from Previous Weekly Reports</b>		
<b>Report #13: WWTP Performance Evaluation</b>	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.
<b>Report #14: Pending Data</b>	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. Available methylmercury results are discussed in Sections 3.5 and 3.6 of Report #18. 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.
<b>Report #15: Pending Data</b>	Methyl mercury, dioxin and furan results for samples collected May 22 – 24 were not reported.	Available analytical results are discussed in Sections 3.2 through 3.6 of Report #16. Methylmercury, 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 July. This item remains open.
<b>Report #16: Pending Data</b>	Analytical results for samples collected May 26 – 28 were not reported.	Available analytical results are discussed in Sections 3.3 through 3.7 of Report #17. Methylmercury, 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 July. 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. Available methylmercury results for the June 4 and June 8 samples are discussed in Section 3.3 of Report #18. Dioxins and furans 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 July. 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.

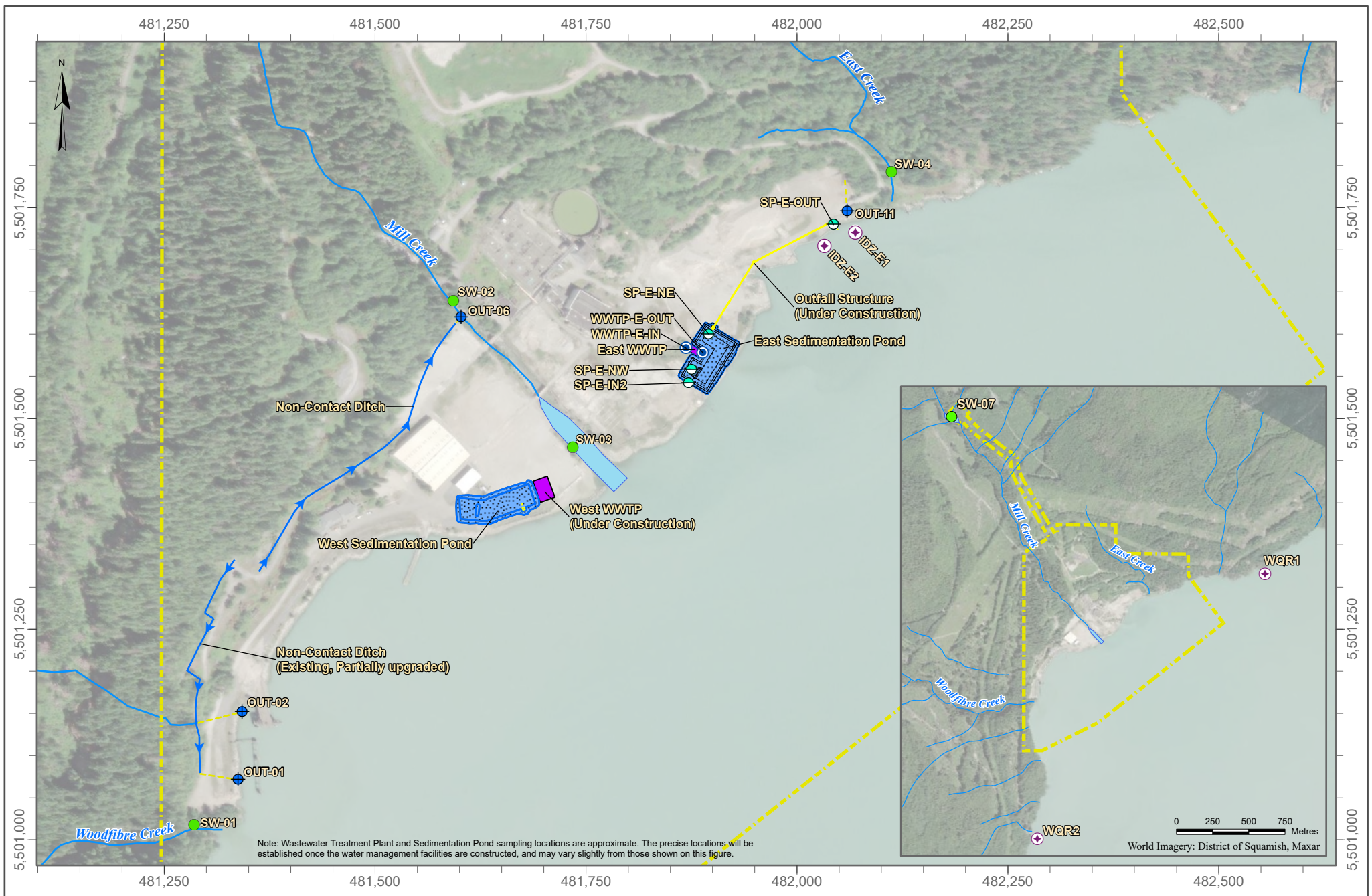
Regards,

**LORAX ENVIRONMENTAL SERVICES LTD.**

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



**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:	Jun 21, 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 (June 15, 2024)

PROJECT #: A633-7

FIGURE: 1

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



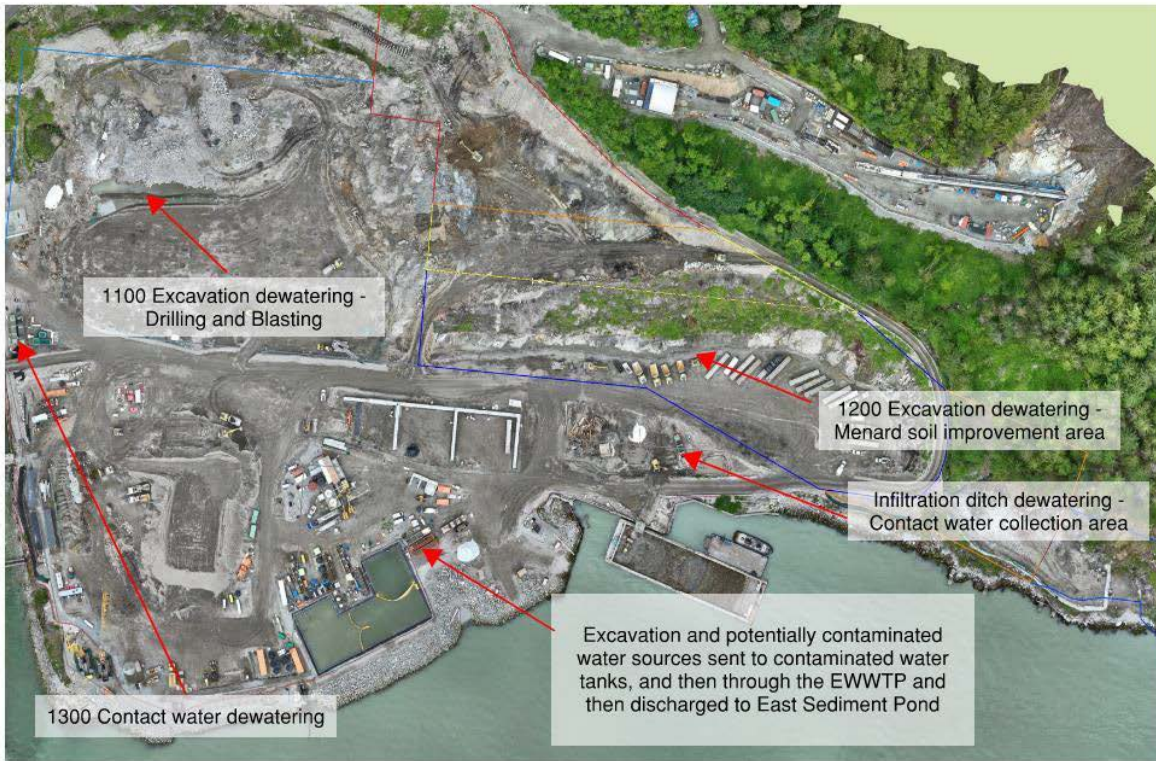
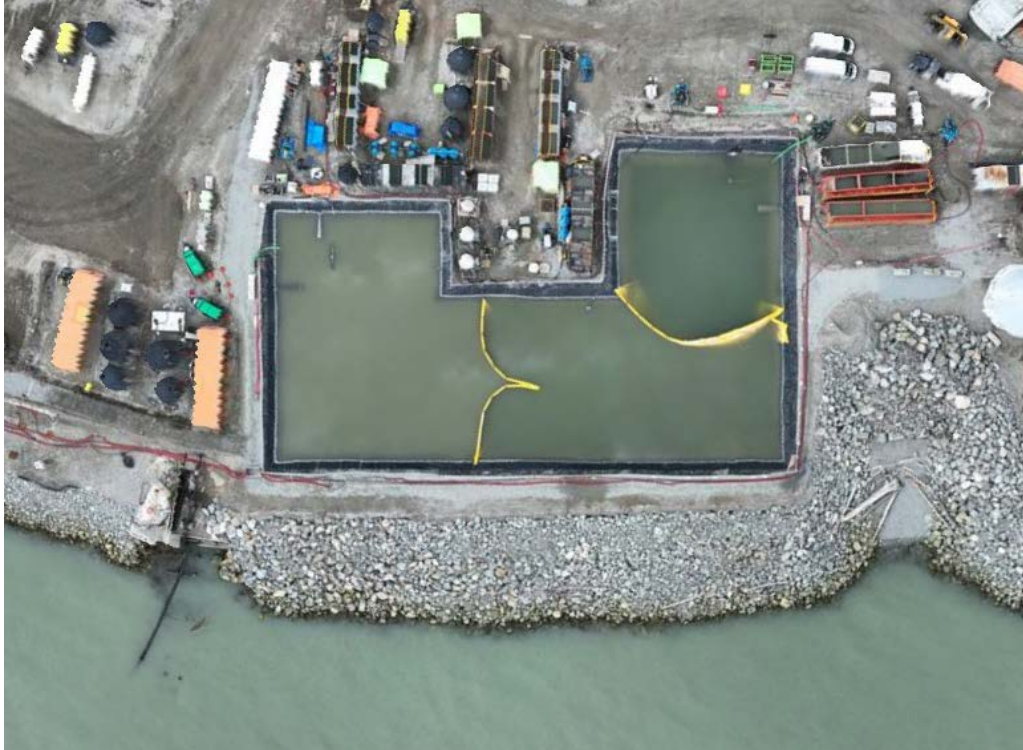


Figure 2: East Catchment Areas Dewatered to the East WWTP June 9 to June 15.



Figure 3: West Catchment Areas Dewatered to the East WWTP June 9 to June 15.



**Figure 4: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains. Water at the inlet (west) section of the pond is cloudy due to elevated TSS in the influent. A progression to less turbid water is observed in the sediment curtain cells from the pond inlet (northwest corner) to the outlet (northeast corner) (June 14, 2024).**



**Figure 5: Aerial view showing the West Sedimentation Pond and West WWTP (located to the right of the pond) on June 14, 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 <sup>*</sup>	East Sedimentation Pond			
					In-Pond at Effluent Location	In-Pond at Effluent Location	In-Pond at Effluent Location	In-Pond at Effluent Location
					SP-E-NE	SP-E-NE	SP-E-NE	SP-E-NE
					VA24B3453-001	VA24B3856-002	VA24B4017-001	VA24B4077-001
		Long Term	Short Term		2024-06-10 14:15	2024-06-13 15:30	2024-06-14 16:00	2024-06-15 15:40
<b>General Parameters</b>								
pH - Field	pH units	- <sup>6</sup>	-	5.5 - 9.0	8.2	6.9	6.3	6.9
Conductivity - Field	µS/cm	-	-	-	1681	1841	1374	1094
Temperature - Field	°C	-	-	-	22.4	21.0	19.2	17.7
Salinity - Field	ppt	-	-	-	0.90	1.02	0.78	0.64
Turbidity - Field	NTU	-	-	-	9.69	7.74	6.17	3.21
TSS	mg/L	-	-	25	3.7	-	<3	5.4
Dissolved Oxygen - Field	mg/L	>=8	-	-	<b>5.97</b>	<b>6.82</b>	<b>7.00</b>	10.69
<b>Anions and Nutrients</b>								
Sulphate	mg/L	-	-	-	54.6	86.6	-	-
Chloride	mg/L	-	-	-	280	515	-	-
Fluoride	mg/L	-	1.5	-	<0.1	<0.2	-	-
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>3</sup>	Variable <sup>3</sup>	-	0.0125	0.0074	-	-
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	0.0161	<0.01	-	-
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	339	-	0.168	<0.05	-	-
<b>Total Metals</b>								
Aluminum, total (T-Al)	mg/L	-	-	-	0.365	0.270	0.402	0.33
Antimony, total (T-Sb)	mg/L	-	0.27 <sup>4</sup>	-	0.00186	0.00196	0.002	0.00199
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00244	0.00225	0.00249	0.00234
Barium, total (T-Ba)	mg/L	-	-	-	0.00848	0.0126	0.0101	0.00797
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	-	-	0.064	0.107	0.081	0.072
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.000025	<0.0000175	<0.00002	<0.000015
Chromium, total (T-Cr)	mg/L	-	-	-	0.00124	0.00102	0.00126	0.00107
Cobalt, total (T-Co)	mg/L	-	-	-	0.00014	<0.0002	0.00014	0.00012
Copper, total (T-Cu)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0043	0.0016	0.00138	0.00176	0.00158
Iron, total (T-Fe)	mg/L	-	-	-	0.180	0.137	0.224	0.201
Lead, total (T-Pb)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0035	0.000701	0.00055	0.000797	0.000826
Manganese, total (T-Mn)	mg/L	-	-	-	0.00635	0.00492	0.00695	0.00563
Mercury, total (T-Hg) <sup>5</sup>	mg/L	0.000016	-	-	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0227	0.0231	0.0247	0.0242
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.0005	<0.001	<0.0005	<0.0005
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000136	<0.0001	0.00016	0.00017
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.00001	<0.00002	<0.00001	<0.00001
Thallium, total (T-Tl)	mg/L	-	-	-	0.000036	0.000033	0.000026	0.000022
Uranium, total (T-U)	mg/L	-	-	-	0.0128	0.0114	0.0138	0.0136
Vanadium, total (T-V)	mg/L	- <sup>6</sup>	-	0.0081	0.00677	0.00583	0.00679	0.00596
Zinc, total (T-Zn)	mg/L	- <sup>6</sup>	- <sup>6</sup>	0.0133	0.0068	0.0099	0.0057	0.0062
Hexavalent Chromium, total	mg/L	0.0015	-	-	0.00088	0.00112	0.00102	0.00094
<b>Dissolved Metals</b>								
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.00002	<0.0000175	<0.00001	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00118	0.00108	0.00109	0.00109
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.01	<0.02	<0.01	<0.01
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.00005	<0.0001	<0.00005	<0.00005
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00279	0.00138	0.00115	0.00228
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.176	0.260	0.154	0.154
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00577	0.00517	0.0057	0.00523
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0048	0.0038	0.0025	0.003
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>								
Acenaphthene	mg/L	0.006	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.000005	<0.000005	0.0000064	<0.000005
Chrysene	mg/L	0.0001	-	-	<0.00001	<0.00001	<0.00005	<0.00001
Fluoranthene	mg/L	-	-	-	<0.00001	0.000011	<0.00001	<0.00001
Fluorene	mg/L	0.012	-	-	<0.00001	<0.00001	0.000011	<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	-	-	-	<0.00002	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	-	-	<0.00001	<0.00001	0.000010	<0.00001
Quinoline	mg/L	-	-	-	<0.00005	<0.00005	<0.00005	<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 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).

<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.

<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
		VA24B3354-001
		2024-06-08 10:40
Methylmercury	µg/L	0.000040

**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>
<b>PE-111578 Discharge Limit</b> <sup>1</sup>		-	-	-	-	5.5 - 9.0	-	-	- <sup>2</sup>
<b>Lowest Applicable Guideline</b> <sup>3,4</sup>		-	>=8	-	-	- <sup>5</sup>	-	-	-
Station ID	Date								
SP-E-NE	2024-06-09 12:48	20.8	<b><u>7.68</u></b>	0.31	11.09	6.7	645	No	473*
SP-E-NE	2024-06-10 14:23	22.4	<b><u>5.97</u></b>	0.9	9.69	8.2	1681	No	0
SP-E-NE	2024-06-11 15:17	20.5	<b><u>7.16</u></b>	1.04	12.86	6.5	1867	No	0
SP-E-NE	2024-06-12 11:56	18.9	<b><u>7.68</u></b>	1.08	6.59	6.7	1859	No	0
SP-E-NE	2024-06-13 8:08	-	-	-	8.82	6.8	-	No	0
SP-E-NE	2024-06-13 13:28	21	<b><u>6.82</u></b>	1.02	7.74	6.9	1841	No	
SP-E-NE	2024-06-14 9:55	-	-	-	3.83	7.9	-	-	0
SP-E-NE	2024-06-14 13:04	19.2	<b><u>7.00</u></b>	0.78	6.17	6.3	1374	No	
SP-E-NE	2024-06-14 10:19	17.7	10.69	0.64	3.21	6.9	1094	No	0
SP-E-NE	2024-06-14 14:16	-	-	-	6.51	6.8	-	-	

**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 9 – June 15, therefore daily measurements for station SP-E-IN-2 were not collected.

\*Discharge from the East Sedimentation Pond attributed to June 9 occurred overnight from 18:58 June 8 until 01:30 June 9.

## ***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	Effluent	Effluent
			WWTP-E-IN	WWTP-E-OUT	WWTP-E-OUT	WWTP-E-OUT
			VA24B3453-003	VA24B3453-002	VA24B3553-001	VA24B3856-001
			2024-06-10 14:00	2024-06-10 14:25	2024-06-11 14:30	2024-06-13 15:50
<b>General Parameters</b>						
pH - Field	pH units	7.0 - 8.7	7.10	7.40	<b><u>6.20</u></b>	7.32
Specific Conductivity - Field	µS/cm	-	650	2145	2219	1590
Temperature - Field	°C	-	29.4	22.4	19.9	19.8
Salinity - Field	ppt	-	0.29	1.15	1.27	0.90
Turbidity - Field	NTU	-	22.97	5.48	4.06	0.38
TSS	mg/L	-	7.9	3.3	<3	-
Dissolved Oxygen - Field	mg/L	>=8	<b><u>2.37</u></b>	<b><u>5.92</u></b>	<b><u>7.16</u></b>	8.31
<b>Anions and Nutrients</b>						
Sulphate	mg/L	-	30	88.7	-	81.7
Chloride	mg/L	-	75	575	-	480
Fluoride	mg/L	-	0.133	<0.4	-	<0.2
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>4</sup>	0.122	0.0257	-	0.0186
Nitrite (N-NO <sub>2</sub> )	mg/L	-	<0.001	<0.02	-	<0.01
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	<0.005	<0.1	-	0.069
<b>Total Metals</b>						
Aluminum, total (T-Al)	mg/L	-	1.21	0.148	0.116	0.0888
Antimony, total (T-Sb)	mg/L	-	0.00187	0.00199	0.00196	0.00197
Arsenic, total (T-As)	mg/L	0.0125	0.00353	0.00268	0.00201	0.0022
Barium, total (T-Ba)	mg/L	-	0.0224	0.0135	0.0135	0.00911
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.056	0.102	0.128	0.102
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000523	<0.00002	<0.00001	<0.00006
Chromium, total (T-Cr)	mg/L	-	0.00137	0.00126	0.00108	0.00094
Cobalt, total (T-Co)	mg/L	-	0.00085	<0.0001	<0.0002	<0.0001
Copper, total (T-Cu)	mg/L	0.002	<b><u>0.00562</u></b>	<b><u>0.0075</u></b>	<0.001	0.00103
Iron, total (T-Fe)	mg/L	-	2.03	0.047	<0.02	0.046
Lead, total (T-Pb)	mg/L	0.002	<b><u>0.00267</u></b>	<b><u>0.00238</u></b>	0.000128	0.00015
Manganese, total (T-Mn)	mg/L	-	0.141	0.0041	0.0013	0.00066
Mercury, total (T-Hg)	mg/L	0.000016	0.0000125	<0.000005	<0.000005	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0259	0.0218	0.0215	0.0238
Nickel, total (T-Ni)	mg/L	0.0083	0.00131	<b><u>0.0151</u></b>	<0.001	<0.0005
Selenium, total (T-Se)	mg/L	0.002	0.000225	0.000145	0.000118	0.000153
Silver, total (T-Ag)	mg/L	0.0015	0.000012	<0.00001	<0.00002	<0.00001
Thallium, total (T-Tl)	mg/L	-	0.000025	0.000056	0.000033	0.000025
Uranium, total (T-U)	mg/L	-	0.0143	0.0109	0.0106	0.0122
Vanadium, total (T-V) <sup>8</sup>	mg/L	0.005	<b><u>0.00606</u></b>	<b><u>0.00588</u></b>	<b><u>0.00582</u></b>	<b><u>0.00536</u></b>
Zinc, total (T-Zn)	mg/L	0.01	<b><u>0.249</u></b>	<b><u>0.0476</u></b>	<b><u>0.0103</u></b>	<b><u>0.0409</u></b>
Hexavalent Chromium, total	mg/L	0.0015	<0.0005	0.00135	0.00090	0.00088
<b>Dissolved Metals</b>						
Cadmium, dissolved (D-Cd)	mg/L	-	<0.000025	<0.00002	<0.00001	<0.000015
Copper, dissolved (D-Cu)	mg/L	-	0.00051	0.00245	0.00083	0.00146
Iron, dissolved (D-Fe)	mg/L	-	0.766	0.012	<0.02	0.032
Lead, dissolved (D-Pb)	mg/L	-	0.000192	0.00142	<0.0001	0.000263
Manganese, dissolved (D-Mn)	mg/L	-	0.13	0.00301	0.00097	0.00052
Strontium, dissolved (D-Sr)	mg/L	-	0.119	0.33	0.313	0.248
Vanadium, dissolved (D-V)	mg/L	-	0.0027	0.00541	0.00581	0.00516
Zinc, dissolved (D-Zn)	mg/L	-	0.127	0.0449	0.0064	0.0597
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	mg/L	0.006	0.000023	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	0.000015	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00005	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	<0.00005	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	0.0000058	<0.000005	<0.000005	<0.000005
Chrysene	mg/L	0.0001	<0.00005	<0.00005	<0.00005	<0.00005
Fluoranthene	mg/L	-	0.000033	<0.00001	<0.00001	<0.00001
Fluorene	mg/L	0.012	0.000021	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	0.000042	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	0.000048	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	0.000091	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	0.000067	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	0.000049	<0.00001	<0.00001	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	<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	0.00157	<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 Water Quality Results Received at the Time of Reporting.**

Parameter	Unit	Minimum Discharge Objective <sup>1</sup>	East WWTP			
			Influent	Effluent	Influent	Effluent
			WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT
			VA24B4017-003	VA24B4017-002	VA24B4077-003	VA24B4077-002
			2024-06-14 16:25	2024-06-14 16:15	2024-06-15 16:05	2024-06-15 15:45
<b>General Parameters</b>						
pH - Field	pH units	7.0 - 8.7	7.26	<b><u>6.96</u></b>	7.10	7.10
Specific Conductivity - Field	µS/cm	-	1009	859	1164	1033
Temperature - Field	°C	-	19.0	18.7	17.7	17.9
Salinity - Field	ppt	-	0.57	0.48	0.66	0.60
Turbidity - Field	NTU	-	35.2	0.0	25.1	0.79
TSS	mg/L	-	5.0	<3	8.4	<3
Dissolved Oxygen - Field	mg/L	>=8	<b><u>7.91</u></b>	<b><u>4.68</u></b>	8.42	10.33
<b>Anions and Nutrients</b>						
Sulphate	mg/L	-	-	-	-	-
Chloride	mg/L	-	-	-	-	-
Fluoride	mg/L	-	-	-	-	-
Ammonia (N-NH <sub>3</sub> )	mg/L	Variable <sup>4</sup>	-	-	-	-
Nitrite (N-NO <sub>2</sub> )	mg/L	-	-	-	-	-
Nitrate (N-NO <sub>3</sub> )	mg/L	3.7	-	-	-	-
<b>Total Metals</b>						
Aluminum, total (T-Al)	mg/L	-	1.31	0.144	1.08	0.0681
Antimony, total (T-Sb)	mg/L	-	0.00202	0.00195	0.00201	0.00194
Arsenic, total (T-As)	mg/L	0.0125	0.00303	0.00252	0.0027	0.00207
Barium, total (T-Ba)	mg/L	-	0.0188	0.00381	0.0189	0.00532
Beryllium, total (T-Be)	mg/L	0.1	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total (T-B)	mg/L	1.2	0.078	0.064	0.086	0.069
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000403	<0.00001	0.000037	<0.000015
Chromium, total (T-Cr)	mg/L	-	0.00188	0.00112	0.0017	0.00081
Cobalt, total (T-Co)	mg/L	-	0.00042	<0.0001	0.00036	<0.0001
Copper, total (T-Cu)	mg/L	0.002	<b><u>0.0131</u></b>	0.00154	<b><u>0.00552</u></b>	<b><u>0.00219</u></b>
Iron, total (T-Fe)	mg/L	-	0.854	0.035	0.796	0.012
Lead, total (T-Pb)	mg/L	0.002	<b><u>0.00318</u></b>	0.000427	<b><u>0.00255</u></b>	0.000976
Manganese, total (T-Mn)	mg/L	-	0.0257	0.00063	0.0221	0.0004
Mercury, total (T-Hg)	mg/L	0.000016	0.000006	<0.000005	0.0000056	<0.000005
Molybdenum, total (T-Mo)	mg/L	-	0.0258	0.0258	0.024	0.0242
Nickel, total (T-Ni)	mg/L	0.0083	0.0078	<0.0005	0.0008	0.00164
Selenium, total (T-Se)	mg/L	0.002	0.000176	0.000155	0.000153	0.000111
Silver, total (T-Ag)	mg/L	0.0015	0.000012	<0.00001	<0.00001	<0.00001
Thallium, total (T-Tl)	mg/L	-	0.000028	0.000016	0.000028	0.000018
Uranium, total (T-U)	mg/L	-	0.0149	0.0151	0.0133	0.0126
Vanadium, total (T-V) <sup>8</sup>	mg/L	0.005	<b><u>0.00856</u></b>	<b><u>0.00624</u></b>	<b><u>0.00767</u></b>	<b><u>0.00531</u></b>
Zinc, total (T-Zn)	mg/L	0.01	<b><u>0.0204</u></b>	0.0046	<b><u>0.0192</u></b>	<b><u>0.0349</u></b>
Hexavalent Chromium, total	mg/L	0.0015	0.00056	0.00104	0.00095	0.00074
<b>Dissolved Metals</b>						
Cadmium, dissolved (D-Cd)	mg/L	-	<0.00002	<0.00001	0.0000185	<0.00001
Copper, dissolved (D-Cu)	mg/L	-	0.00209	0.00122	0.00203	0.0015
Iron, dissolved (D-Fe)	mg/L	-	0.012	<0.01	0.015	<0.01
Lead, dissolved (D-Pb)	mg/L	-	<0.00005	<0.00005	<0.00005	0.00031
Manganese, dissolved (D-Mn)	mg/L	-	0.00655	0.0003	0.00681	0.00076
Strontium, dissolved (D-Sr)	mg/L	-	0.162	0.108	0.176	0.151
Vanadium, dissolved (D-V)	mg/L	-	0.00583	0.0058	0.00538	0.00525
Zinc, dissolved (D-Zn)	mg/L	-	0.0056	0.0027	0.0099	0.0334
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	mg/L	0.006	<0.00001	<0.00001	<0.00001	<0.00001
Acridine	mg/L	-	<0.00001	<0.00001	<0.00001	<0.00001
Anthracene	mg/L	-	<0.00001	<0.00001	<0.00001	<0.00001
Benz(a)anthracene	mg/L	-	<0.00001	<0.00001	<0.00001	<0.00001
Benzo(a)pyrene	mg/L	0.00001	0.0000074	<0.000005	0.0000081	<0.000005
Chrysene	mg/L	0.0001	<0.00005	<0.00005	<0.00005	<0.00005
Fluoranthene	mg/L	-	0.000018	<0.00001	0.000020	<0.00001
Fluorene	mg/L	0.012	<0.00001	<0.00001	<0.00001	<0.00001
1-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001	<0.00001
2-methylnaphthalene	mg/L	0.001	<0.00001	<0.00001	<0.00001	<0.00001
Naphthalene	mg/L	0.001	<0.00005	<0.00005	<0.00005	<0.00005
Phenanthrene	mg/L	-	<0.00002	<0.00002	<0.00002	<0.00002
Pyrene	mg/L	-	0.000017	<0.00001	0.000019	<0.00001
Quinoline	mg/L	-	<0.00005	<0.00005	<0.00005	<0.00005
<b>Volatile Organic Compounds (VOCs)</b>						
Benzene	mg/L	0.11	-	-	-	-
Ethylbenzene	mg/L	0.25	-	-	-	-
Methyl-tert-butyl-ether	mg/L	5	-	-	-	-
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:**<sup>1</sup> Minimum discharge objective for the WWTP effluent.Results **underlined in bold italics** exceed the applicable minimum discharge objective.

**Table C-3: 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	2024-06-09 12:52	33.5	<b><u>2.61</u></b>	0.28	25.45	<b><u>6.9</u></b>	594	No	-
WWTP-E-OUT	2024-06-09 12:44	22.4	<b><u>2.35</u></b>	0.33	8.33	<b><u>6.1</u></b>	645	No	499
WWTP-E-IN	2024-06-10 14:08	29.4	<b><u>2.37</u></b>	0.29	22.97	7.1	650	No	-
WWTP-E-OUT	2024-06-10 14:35	22.4	<b><u>5.92</u></b>	1.15	5.48	7.4	2145	No	556
WWTP-E-IN	2024-06-11 15:21	22.1	<b><u>5.06</u></b>	0.29	23.24	7.1	563	No	-
WWTP-E-OUT	2024-06-11 15:13	19.9	<b><u>7.93</u></b>	1.27	4.06	<b><u>6.2</u></b>	2219	No	448
WWTP-E-OUT <sup>3</sup>	2024-06-12	-	-	-	-	-	-	-	552
WWTP-E-IN	2024-06-13 12:53	19.2	8.33	0.43	29.9	7.57	770	No	-
WWTP-E-OUT	2024-06-13 12:47	19.8	8.31	0.9	0.38	7.32	1590	No	539
WWTP-E-IN	2024-06-14 12:57	19	<b><u>7.91</u></b>	0.57	35.2	7.26	1009	No	-
WWTP-E-OUT	2024-06-14 13:07	18.7	<b><u>4.68</u></b>	0.48	0.0	<b><u>6.96</u></b>	859	No	506
WWTP-E-IN	2024-06-15 10:00	17.7	8.42	0.66	25.1	7.1	1164	No	-
WWTP-E-OUT	2024-06-15 10:23	17.9	10.33	0.6	0.79	7.1	1033	No	497

**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> Field measurements were not collected at WWTP-E-IN and WWTP-E-OUT on June 12 as plant was down for maintenance at the time of monitoring.

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

The East WWTP was periodically inactive throughout the day on June 12 for maintenance and was inactive at the time of sample collection, therefore WWTP-E-IN and WWTP-E-OUT were not sampled.

## ***Appendix D: Non-Contact Diversion Outlet Results***

**Table D-1: Summary of Freshwater Quality Results for Methylmercury Results Received at the Time of Reporting.**

Parameter	Unit	Station OUT-02
		Non-Contact Water Diversion Ditch Outlet
		OUT-02
		VA24B1054-003
		2024-05-16 12:40
Methylmercury	µg/L	0.000022

## ***Appendix E: Freshwater Receiving Environment Results***

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

Parameter	Unit	Station SW-01	Station SW-02	Station SW-07	Station SW-04
		Lower Reach of Woodfibre Creek (near the mouth)	Upper Reach of Mill Creek (upstream of the third bridge)	Upstream Mill Creek (at the diversion inlet)	Lower Reach of East Creek (near the outlet to the outfall culvert)
		SW-01	SW-02	SW-07	SW-04
		VA24B1054-001	VA24B0795-001	VA24B0795-003	VA24B1054-002
		2024-05-16 12:26	2024-05-14 9:55	2024-05-14 12:35	2024-05-16 14:56
Methylmercury	µg/L	<0.000020	<0.000020	<0.000020	0.000022

## ***Appendix F: Estuarine Receiving Environment Results***

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

<b>Parameter</b>	<b>Unit</b>	<b>Station SW-03</b>
		<b>Mill Creek Estuary</b>
		<b>SW-03</b>
		<b>VA24B0795-002</b>
		<b>2024-05-14 11:15</b>
<b>Methylmercury</b>	<b>µg/L</b>	<0.00020



## ***Appendix G: Marine Water Receiving Environment Results***





**Table G-3: Summary of IDZ Marine Water Quality Results for Methylmercury 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
		VA24B2772-004	VA24B2772-005	VA24B2772-006	VA24B2772-007	VA24B2772-008	VA24B2772-009
		2024-06-04 16:10	2024-06-04 16:40	2024-06-04 17:10	2024-06-04 15:00	2024-06-04 15:15	2024-06-04 15:30
Methylmercury	µg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

**Table G-4: Summary of IDZ Marine Water Quality Results for Methylmercury 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
		VA24B3452-001	VA24B3452-002	VA24B3452-003	VA24B3452-004	VA24B3452-005	VA24B3452-006
		2024-06-10 8:00	2024-06-10 8:00	2024-06-10 8:00	2024-06-10 8:30	2024-06-10 8:40	2024-06-10 9:00
Methylmercury	µg/L	0.000020	<0.000020	0.000026	0.000024	<0.000020	<0.000020

**Table G-5: Summary of Reference Station Marine Water Quality Results for Methyl Mercury Received at the Time of Reporting**

Parameter	Unit	Station WQR1			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
		WQR1-0.5	WQR1-2m	WQR1-SF	WQR1-0.5	WQR1-2m	WQR1-SF
		VA24B2772-001	VA24B2772-002	VA24B2772-003	VA24B3452-007	VA24B3452-008	VA24B3452-009
		2024-06-04 9:30	2024-06-04 9:45	2024-06-04 10:05	2024-06-10 17:53	2024-06-10 18:18	2024-06-10 18:24
Methylmercury	µg/L	<0.000020	<0.000020	<0.000020	0.000021	0.000020	0.000021

**Table G-6: Summary of Reference Station Marine Water Quality Results for Methyl Mercury Received at the Time of Reporting.**

Parameter	Unit	Station WQR2		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR2-0.5	WQR2-2m	WQR2-SF
		VA24B3452-010	VA24B3452-011	VA24B3452-012
		2024-06-10 17:30	2024-06-10 17:38	2024-06-10 17:45
Methylmercury	µg/L	<0.000020	<0.000020	<0.000020

