TECHNICAL MEMORANDUM

To:	**Ian McAllister, Ashleigh Crompton, Mike Champion, Jackie Boruch and Ryan Schucroft (Woodfibre LNG)**	**Date: 04 Oct 2024**
From:	**Cheng Kuang, Holly Pelletier (Lorax)**	**Project #: A633-8**
Subject:	**PE-111578 Weekly Discharge and Compliance Report #33 for September 22 – 28**	

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 for contact water discharges 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 #33) was prepared by Lorax Environmental and summarizes monitoring conducted the week of (September 22 – 28) for contact waters directed to a Wastewater Treatment Plant (WWTP) or a sedimentation pond. Monitoring data and pending results from prior monitoring periods available at the time of reporting are tabulated and included as appendices to this memorandum. Report #33 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 memorandum. 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, overburden and bedrock excavation, and construction of contact water management facilities. Shoring works along the shoreline and foreshore areas were initiated in December 2023, and in early 2024 construction of water management infrastructure commenced and has continued through the September 22 – 28 monitoring period. The East WWTP and East Sedimentation Pond are commissioned for operation and discharge since April 15, 2024. The West WWTP and West Sedimentation Pond are constructed. The non-contact and contact water conveyance ditches described in PE-111578 are partially constructed or will be constructed when site preparation activities are completed (*e.g.*, site grading, bedrock excavation). The PE-111578 water management facilities that are completed or were under construction during the reporting period are shown in Figure 1. Established contact water collection and dewatering locations and photographs of the sedimentation ponds are shown in Appendix A, Figure 2 through Figure 5.

The non-contact water diversion ditch west of Mill Creek was upgraded and commissioned for use on April 7 and discharges to Mill Creek at station OUT-06 (Figure 1). Other pre-existing diversion ditches west of Mill Creek have been partially upgraded and discharge at station OUT-02. During heavy precipitation these ditches also convey non-contact water to station OUT-01. Temporary diversion of East Creek through OUT-11 started on September 17.

The East and West catchments 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 and contaminated contact waters within the catchments are managed to remain on site using a system of sumps and baker tanks for intermediate storage and are then directed to the East WWTP for treatment. During periods of heavy precipitation, non-contaminated contact water may also be directed to the East or West Sedimentation Ponds for settling of TSS prior to discharge (East Pond) or for storage (West Pond).

A revised schedule is being developed to complete the installation of the East and West Sedimentation Pond permanent outfall structures. 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 not commissioned for discharge. Surplus water in the West Sedimentation Pond is pumped to the East WWTP for treatment prior to discharge through the East Sedimentation Pond.

Pilot testing of the East WWTP continued during the monitoring period (September 22 – 28). Contaminated and potentially contaminated contact waters from the 1100, 1200C, 1300, 4100, 4200 Areas were directed to the East WWTP for treatment, as well as water recirculated from the East Sedimentation Pond (Appendix A, Figure 2 and Figure 3). A total of 3,855 m^3 of treated WWTP effluent was discharged to the East Sedimentation Pond during the reporting period (September 22 – 28). Daily East WWTP effluent flows are provided in Appendix C (Table C-2). The East Sedimentation Pond intermittently discharged on September 25 by pumping effluent to the discharge location SP-E-OUT. A total of 213 m^3 of effluent was discharged to Howe Sound during the reporting period.

The West WWTP is undergoing pilot trials. During the monitoring period (September 22 – 28), the West WWTP received contaminated and potentially contaminated contact waters from the 4100 and 4200 Areas as well as water recirculated from the West Sedimentation Pond each day. A total of 116 m^3 of treated WWTP effluent was discharged to the West Sedimentation Pond as part of pilot testing. Daily West WWTP effluent flows are provided in Appendix E (Table E-3). The West Sedimentation Pond is complete, except for the outfall structure, and has not been commissioned for discharge. There were no discharges from the West Sedimentation Pond to Howe Sound during the monitoring period.

The weather was variable during the monitoring period (September 22 – 28), with precipitation recorded at the Woodfibre site weather station each day except September 28. The total weekly precipitation amount was 68.2 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
09-22-2024	6.6	15.0	13.0	Partly Cloudy/Showers
09-23-2024	2.0	18.1	13.2	Partly Cloudy/Drizzle
09-24-2024	10.0	21.9	13.5	Overcast/Rain
09-25-2024	27.2	16.0	11.9	Overcast/Rain
09-26-2024	11.6	14.1	10.5	Overcast/Rain
09-27-2024	10.8	18.0	10.5	Overcast/Rain
09-28-2024	0	15.8	10.1	Partly Cloudy

Note: Data retrieved from the Stantec Woodfibre site weather station.

2. Monitoring Summary

The PE-111578 authorized works were under construction during the September 22 – 28 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 initial dilution zone (IDZ) locations (WQR1, WQR2, IDZ-E1 and IDZ-E2).
- Non-contact diversion ditch outlets (OUT-01, OUT-02, OUT-06, and OUT-11). East Creek water was temporarily diverted to OUT-11 on September 17.
- Contact water monitoring locations (WWTP-E-IN, WWTP-E-OUT, SP-E-IN-2, SP-E-OUT, SP-E-NE, SP-E-NW, WWTP-W-IN, WWTP-W-OUT, SP-W-W, and SP-W-E).

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. In-pond monitoring stations have been established for the West Sedimentation Pond at locations SP-W-W and SP-W-E and are used for pond water quality monitoring during the West WWTP pilot trials.

Water quality was monitored at stations SW-01, SW-04, OUT-11, IDZ-E1, IDZ-E2, IDZ-W2, WQR1, WQR2, WWTP-E-IN, WWTP-E-OUT, SP-E-NE, SP-E-NW, WWTP-W-IN, WWTP-W-OUT, SP-W-W, and SP-W-E during the monitoring period (September 22 – 28). Sampling dates and parameters tested are summarized in Table 2. Daily field parameters and a weekly analytical sample were not collected at influent station SP-E-IN-2 as the East Sedimentation Pond did not receive contact water inflows during the monitoring period.

Overall, the PE-111578 monitoring requirements that were applicable during the monitoring period (September 22 – 28) were met with the following exceptions. Field measurements and an analytical sample were not collected at SP-E-OUT on September 25. Daily field measurements were not collected at the influent and effluent stations of the West WWTP (WWTP-W-IN and WWTP-W-OUT, respectively) from September 24 – 28 as the West WWTP was not active at the time of monitoring and weekly analytical samples were not collected. Monthly sampling requirements for OUT-11were met except for methylmercury. A follow-up investigation has been initiated with the QEP on record for sampling that was not conducted as prescribed in PE-111578. This item is tracked in Table 8.

Table 2: Summary of PE-111578 Monitoring Samples Collected September 22 – 28.

Sampling Date	Sample	Description	Parameters Tested	Monitoring Frequency
September 22, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
	WWTP-W-OUT	West WWTP effluent		
	WWTP-W-IN	West WWTP influent		
September 23, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-OUT	East WWTP effluent	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease.	D, W_1, W_2
	WWTP-E-IN	East WWTP influent		
	WWTP-W-OUT	West WWTP effluent	Field Parameters.	D
	WWTP-W-IN	West WWTP influent		
September 24, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
	IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	Physical Parameters.	W_3
	IDZ-E1-2m	Howe Sound IDZ station E1; 2 m below surface		
	IDZ-E1-SF	Howe Sound IDZ station E1; 2 m above the seafloor		
	IDZ-E2-0.5	Howe Sound IDZ station E2; 0.5 m below surface		
	IDZ-E2-2m	Howe Sound IDZ station E2; 2 m below surface		
	IDZ-E2-SF	Howe Sound IDZ station E2; 2 m above the seafloor		
	WQR1-0.5	Reference site 1; 0.5 m below surface.	Field Parameters.	P
	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.		
September 25, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality	Field Parameters.	P
	WWTP-E-OUT	East WWTP effluent	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	D, W_1
	WWTP-E-IN	East WWTP influent		
	SP-W-E [1]	West Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	P
	SP-W-W [1]	West Sedimentation Pond, in-pond sample, represents influent quality		
	IDZ-W2-0.5	Howe Sound IDZ station E2; 0.5 m below surface	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	IDZ-W2-2m	Howe Sound IDZ station E2; 2 m below surface		
	IDZ-W2-SF	Howe Sound IDZ station E2; 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.		
September 26, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field Parameters.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality		
	WWTP-E-OUT	East WWTP effluent	Field Parameters.	D
	WWTP-E-IN	East WWTP influent		
	SP-W-E [1]	West Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
September 27, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	SP-E-NW [1]	East Sedimentation Pond, in-pond sample, represents influent quality	Field Parameters.	P
	WWTP-E-OUT	East WWTP effluent	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	D, W_1
	WWTP-E-IN	East WWTP influent		
	SP-W-E [1]	West Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
September 28, 2024	SP-E-NE [1]	East Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	WWTP-E-OUT	East WWTP effluent	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	D, W_1
	WWTP-E-IN	East WWTP influent		
	SP-W-E [1]	West Sedimentation Pond, in-pond sample, represents effluent quality	Field, Physical & General Parameters, EPHs & PAHs, Total, Dissolved and Speciated Metals.	P
	SW-01	Lower Reach of Woodfibre Creek (near the mouth)	Field, Physical & General Parameters, VH & BTEX, EPHs & PAHs, Total, Dissolved and Speciated Metals, VOCs, Methylmercury, Dioxins & Furans, Glycols, Oil and Grease.	M
	SW-04	Lower Reach of East Creek (near the outlet to the outfall culvert)		
	OUT-11	Non-contact diversion ditch outlet	Field, Physical & General Parameters, Total, Dissolved and Speciated Metals.	M

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_1 – 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_2 - 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_3 – initial high frequency monitoring for physical parameters at IDZ stations (weekly for the first 5 weeks of monitoring).
P - periodic monitoring for targeted parameters that is supplementary to PE-111578 requirements.
[1] 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. Similarly, the West Sedimentation Pond in-pond stations, SP-W-W and SP-W-E are monitored for water management purposes. The monitoring of in-pond stations is not a PE-111578 requirement and is conducted at the discretion of field staff.

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, operational minimum discharge objectives (MDOs) that the WWTPs are currently being operated to meet, PE-111578 discharge limits, as well as Canadian, Federal and BC water quality guidelines (WQGs). The screening results are discussed in Section 3. All water quality data 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 interpretation.

Canadian, Federal and BC WQGs are not specified for dioxins and furans. The general term "dioxins and furans" refers to chlorinated dibenzo-*p*-dioxins and chlorinated dibenzofurans. A sub-set of 17 polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are typically evaluated for toxicity and the individual parameter concentrations are converted to toxic equivalent (TEQ) values that are summed and reported as a single PCDD/F TEQ parameter. To address uncertainties for results reported as not detected, two PCDD/F TEQ values are reported. A "lower-bound PCDD/F TEQ" is calculated assuming a concentration of zero for results reported as not detected, therefore, if all 17 of the individual compounds in the sub-set are not detected the lower-bound PCDD/F TEQ will equal zero. An "upper-bound PCDD/F TEQ" is calculated assuming a concentration equal to the detection limit for results reported as not detected. These two parameters span the range of possible TEQs if one or more of the sub-set of 17 individual PCDDs and PCDFs are not detected.

3.2 Summary of Reported Results

Field measurements and analytical results available at the time of reporting for samples collected during the monitoring period (September 22 – 28) and for other samples that have not been previously reported are listed below in Table 3. Analytical results not available at the time of reporting will be included in future weekly reports when testing is completed. Testing for methylmercury, dioxins and furans typically requires up to four weeks to complete. Results are pending for the following samples and parameters:

- WWTP-E-IN and WWTP-E-OUT collected September 23 (methylmercury, dioxins and furans)
- IDZ-E1 and IDZ-E2 collected September 24 (field measurements and all analytical parameters)

- SP-W-E collected September 27 (all analytical parameters)
- SP-E-NE, SP-W-E, WWTP-E-IN, and WWTP-E-OUT collected September 28 (all analytical parameters)
- SW-01, SW-04, and OUT-11 collected September 28 (field measurements and all analytical parameters)

Table 3: Summary of Analytical Results Included in Weekly Discharge and Compliance Report #33.

Sample	Description	Sampling Date	Parameters Reported
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	August 23, 2024	Dioxins and Furans.
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.	August 26, 2024	Dioxins and Furans.
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.		
SW-03	Mill Creek estuary	August 28, 2024	Dioxins and Furans.
WWTP-W-OUT	West WWTP effluent	September 13, 2024	Methylmercury.
WWTP-W-IN	West WWTP influent		
IDZ-E1-0.5	Howe Sound IDZ station E1; 0.5 m below surface	September 18, 2024	Physical Parameters.
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		
WWTP-W-OUT	West WWTP effluent	September 21, 2024	Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs and VOCs.
WWTP-W-IN	West WWTP influent		
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	September 23, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
SP-E-NW	East Sedimentation Pond, in-pond sample, represents influent quality		
WWTP-E-OUT	East WWTP effluent		Field, Physical and General Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs and VOCs.
WWTP-E-IN	East WWTP influent		
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	September 25, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
WWTP-E-OUT	East WWTP effluent		
WWTP-E-IN	East WWTP influent		
SP-W-E	West Sedimentation Pond, in-pond sample, represents effluent quality	September 26, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
SP-E-NE	East Sedimentation Pond, in-pond sample, represents effluent quality	September 27, 2024	Field and Physical Parameters, Total and Dissolved Metals, Hexavalent Chromium, PAHs.
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 Canadian, Federal and BC WQGs for the protection of marine water aquatic life. Influent water is not discharged from site, therefore only effluent water quality is assessed for exceedances. The analytical results, daily field parameters, discharge limits and WQGs are summarized in Table B-1 (analytical results) and Table B-2 (field measurements) of Appendix B. Screening results are summarized below for parameter concentrations that exceeded WQGs at the in-pond effluent quality station (Table 4).

During the monitoring period (September 22 – 28), 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.

The East Sedimentation Pond intermittently discharged on September 25 by pumping effluent to the discharge location SP-E-OUT. Field measurements and an analytical sample were not collected at SP-E-OUT on September 25 while the pond was discharging. A follow-up investigation has been initiated with the QEP on record and this item is being tracked in Table 8.

Field measurements were taken daily at the in-pond effluent quality station (SP-E-NE) during the monitoring period (September 22 – 28) and daily at the in-pond influent quality station (SP-E-NW) except on September 28. Analytical samples were collected at SP-E-NE on September 23, 25, 27, and 28, and at SP-E-NW on September 23.

Field pH ranged from 6.5 to 8.4 at SP-E-NE during the monitoring period (September 22 – 28), while dissolved oxygen ranged from 6.54 to 8.60 mg/L, and turbidity ranged from 1.51 to 9.56 NTU (Appendix B, Table B-2). Dissolved oxygen measured at station SP-E-NE during the monitoring period (September 22 – 28) was below the lower limit of the WQG (≥8 mg/L; Table 4) except on September 24.

Field pH ranged from 7.0 to 8.3 at SP-E-NW during the monitoring period (September 22 – 28), while dissolved oxygen ranged from 4.70 to 7.39 mg/L, and turbidity ranged from 6.57 to 10.90 NTU (Appendix B, Table B-2). Dissolved oxygen measured at station SP-E-NW during the monitoring period (September 22 – 28) was below the lower limit of the WQG (≥8 mg/L).

Analytical results for samples collected September 23, 25, and 27 were available at the time of reporting and results met PE-111578 discharge limits. Analtyical results for the in-pond effluent sample collected on September 28 were not available at the time of reporting and results will be included in future weekly reports when available.

Table 4:
Summary of Parameters Exceeding WQGs at the In-Pond Effluent Quality Station SP-E-NE (September 22 – 28)

Parameter	Units	WQG	N	N >WQG	Commentary
Field Dissolved Oxygen	mg/L	≥8	7	6	Dissolved oxygen measured at station SP-E-NE during the monitoring period (September 22 – 28) was below the lower limit of the WQG except on September 24 (8.60 mg/L).

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 operational minimum discharge objectives (MDOs) which the WWTP is currently being operated to meet. For previous reports (up to Report #30) the WWTP results were screened against design MDOs which are the same as the operational MDOs, except for parameters with sedimentation pond discharge limits (pH, TSS, total copper, total lead, total vanadium and total zinc). For these parameters, the design MDOs are equal to the lowest WQG values for these parameters whereas the operational MDOs are set to the sedimentation pond discharge limits. Therefore, the weekly report screening criteria have been updated to align with the operational MDOs.

Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet the operational MDOs. The analytical results, daily field measurements, and the operational MDOs are summarized in Table C-1 (analytical results) and Table C-2 (field measurements) of Appendix C. Screening results are summarized in Table 5 for parameter concentrations that do not meet the operational MDOs in WWTP effluent.

The East WWTP received contact water as well as recirculated water from the East Sedimentation Pond each day during the monitoring period. The influent waters were treated by the East WWTP and discharged to the East Sedimentation Pond. Field measurements were collected each day at the influent (WWTP-E-IN) and effluent (WWTP-E-OUT) stations.

Field pH ranged from 6.5 to 7.4 at WWTP-E-IN during the monitoring period (September 22 – 28), while dissolved oxygen ranged from 6.10 to 8.08 mg/L, and turbidity ranged from 1.99 to 8.39 NTU (Appendix C, Table C-2). Field pH, dissolved oxygen, and turbidity in the East WWTP effluent (WWTP-E-OUT) ranged from pH 6.2 to 7.5, 4.50 to 7.63 mg/L, and 0.55 to 6.03 NTU, respectively.

Analytical samples collected from the East WWTP influent and effluent stations on September 23, 25, and 27 were available at the time of reporting. Effluent quality monitored at WWTP-E-OUT achieved operational MDOs for all parameters except for total copper in the September 25 sample (Table 5).

Table 5:
Summary of Parameters Outside Operational Minimum Discharge Objectives (MDOs) at East WWTP Effluent Station WWTP-E-OUT (September 22 – 28).

Parameter	Units	MDO	N	N >MDO	Commentary
Total Copper	mg/L	0.0043	3	1	The total copper concentration in the September 25 effluent sample (0.00559 mg/L) was 1.3 times the operational MDO.

MDO = minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
N = number of samples.
Non-detect results are screened using the detection limit value.

3.5 West Sedimentation Pond

The West Sedimentation Pond influent and effluent results are screened against PE-111578 discharge limits. Parameters without a discharge limit are screened against Canadian, Federal and BC 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, discharge limits and WQGs are summarized in Table D-1 (analytical results) and Table D-2 (field measurements) of Appendix D. Screening results are summarized below for parameter concentrations that exceeded WQGs at the in-pond effluent quality station (Table 6).

Field measurements were taken at the in-pond effluent quality station (SP-W-E) from September 25 to 28 and at the in-pond influent quality station (SP-W-W) on September 25 and 26 during the monitoring period (September 22 – 28).

Field pH ranged from 7.5 to 9.3 at SP-W-E during the monitoring period (September 22 – 28), while dissolved oxygen ranged from 3.60 to 8.49 mg/L, and turbidity ranged from 4.46 to 11.80 NTU (Appendix D, Table D-2). Dissolved oxygen measured at station SP-W-E on September 25 and 28 was below the lower limit of the WQG (≥8 mg/L; Table 6).

Field pH ranged from 7.4 to 8.0 at SP-W-W during the monitoring period (September 22 – 28) and turbidity ranged from 8.01 to 17.8 NTU (Appendix D, Table D-2). Dissolved oxygen was measured on September 25 (6.81 mg/L) and was below the lower limit of the WQG (≥8 mg/L).

An analytical sample was collected at SP-W-E on September 26. Effluent quality monitored at the in-pond station SP-W-E met PE-111578 discharge limits and WQGs. The West Sedimentation Pond is not commissioned for discharge and did not discharge during the monitoring period.

Table 6:
Summary of Parameters Exceeding WQGs at the In-Pond Effluent Quality Station SP-W-E (September 22 – 28)

Parameter	Units	WQG	N	N >WQG	Commentary
Field Dissolved Oxygen	mg/L	≥8	4	2	Dissolved oxygen measured at station SP-E-NE on September 25 (3.60 mg/L) and September 28 (7.77 mg/L) was below the lower limit of the WQG.

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

3.6 West Wastewater Treatment Plant

The West WWTP influent and effluent results are screened against the operational MDOs which the WWTP is currently being operated to meet. For previous reports (up to Report #30) the WWTP results were screened against design MDOs which are the same as the operational MDOs, except for parameters with sedimentation pond discharge limits (pH, TSS, total copper, total lead, total vanadium and total zinc). For these parameters, the design MDOs are equal to the lowest WQG values for these parameters whereas the operational MDOs are set to the sedimentation pond discharge limits. Therefore, the weekly report screening criteria have been updated to align with the operational MDOs.

Contaminated contact water is directed to the WWTP influent, and it is expected that influent water is unlikely to meet the operational MDOs. The analytical results and the operational MDOs for the West WWTP pilot testing are summarized in Table E-1 and E-2 (analytical results) and Table E-3 (field measurements) of Appendix E.

The West WWTP received contact water as well as recirculated water from the West Sedimentation Pond each day during the monitoring period (September 22 – 28). Field measurements were collected on September 22 and 23 at the influent (WWTP-W-IN) and effluent (WWTP-W-OUT) stations.

Field pH was 7.3 at WWTP-W-IN on both September 22 and 23, while dissolved oxygen varied from 7.12 to 8.54 mg/L, and turbidity varied from 6.95 to 8.50 NTU (Appendix E, Table E-3). Field pH, dissolved oxygen, and turbidity in the West WWTP effluent (WWTP-W-OUT) varied from pH 5.9 to 7.0, 6.37 to 7.67 mg/L, and 3.75 to 6.99 NTU, respectively.

Analytical samples collected from the West WWTP influent and effluent stations on September 21 (as discussed in Weekly Report #32) were available at the time of reporting. Effluent quality monitored at WWTP-W-OUT achieved operational MDOs for all parameters except for total zinc (Table 7). The West WWTP is undergoing early-stage pilot trials.

Methylmercury analytical results were available at the time of reporting for the West WWTP influent and effluent samples collected on September 13 (as discussed in Weekly Report #31).

Methylmercury concentrations were 0.000074 µg/L at WWTP-W-IN and 0.000024 µg/L at WWTP-W-OUT.

Table 7:
Summary of Parameters Outside Operational Minimum Discharge Objectives (MDOs) at West WWTP Effluent Station WWTP-W-OUT.

Parameter	Units	MDO	N	N >MDO	Commentary
Total Zinc	mg/L	0.0133	1	1	The total zinc concentration in the September 21 effluent sample (0.0140 mg/L) was 1.1 times the operational MDO.

MDO = minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
N = number of samples.
Non-detect results are screened using the detection limit value.

3.7 Non-Contact Water Diversion Ditch Outlets

Water quality results were not available for the non-contact water diversion ditch outlets at the time of reporting.

3.8 Freshwater and Estuarine Water Receiving Environment

Water quality results were not available for the freshwater water receiving environment at the time of reporting.

Dioxins and furans analytical results were available at the time of reporting for the August 28 estuarine water sample (as discussed in Weekly Report #29) collected near the mouth of Mill Creek (station SW-03). The lower and upper bound PCDD/F TEQ concentrations were 0.0343 and 0.948 pg/L, respectively. The PCDD/F TEQ concentrations are within the range observed in the pre-construction baseline monitoring program.

3.9 Marine Water Receiving Environment

Marine water receiving environment samples are screened against Canadian, Federal and BC 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 were available for the September 18 (physical parameters only) marine receiving environment samples collected at IDZ-E1 and IDZ-E2 at 0.5 and 2 m below the water surface and 2 m above the seafloor (as discussed in Weekly Report #32). Parameter concentrations met WQGs.

Dioxins and furans analytical results were available at the time of reporting for the marine water receiving environment stations IDZ-E1 and IDZ-E2 collected on August 23 (as discussed in

Weekly Report #28) and for marine reference stations WQR1 and WQR2 collected on August 26 (as discussed in Weekly Report #29). Samples were collected at 0.5 and 2 m below the water surface and at 2 m above the seafloor at each station.

The lower and upper bound PCDD/F TEQ concentrations varied from 0 to 0.00267 pg/L and from 0.805 to 1.03 pg/L, respectively, in the August 23 IDZ-E1 and IDZ-E2 samples collected at 0.5 m below surface. The lower and upper bound PCDD/F TEQ concentrations varied from 0.00197 to 0.00378 pg/L and from 0.842 to 1.05 pg/L, respectively, at 2 m below the surface. The lower bound PCDD/F TEQ concentrations were 0 pg/L at 2 m above the seafloor in both samples, while the upper bound PCDD/F TEQ concentrations varied from 0.783 to 0.854 pg/L.

The lower and upper bound PCDD/F TEQ concentrations varied from 0 to 0.00810 pg/L and from 0.884 to 0.931 pg/L, respectively, in the August 26 WQR1 and WQR2 samples collected at 0.5 m below surface. The lower and upper bound PCDD/F TEQ concentrations varied from 0 to 0.0158 pg/L and from 0.876 to 0.911 pg/L, respectively, at 2 m below the surface. The lower and upper bound PCDD/F TEQ concentrations varied from 0 to 0.00375 pg/L and from 0.922 to 1.01 pg/L, respectively, at 2 m above the seafloor.

The PCDD/F TEQ concentrations were within the concentration ranges observed in the pre-construction baseline monitoring program for the marine reference stations. There is no pre-construction baseline data for the marine reference stations WQR1 and WQR2 at 0.5 m below surface.

4. Quality Control

This section presents the results of the quality control (QC) evaluation for the PE-111578 weekly report (Table 8). The evaluation includes a review of field and lab QC, completeness of the weekly report (*e.g.,* 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 Section 3 are also tracked in Table 8. Any items flagged for follow-up are carried forward to future reports until they are closed.

Table 8: Weekly Report QC Evaluations and Ongoing Items

QC Procedure	Observation	Investigation/Resolution
Reporting Period (September 22 – 28, Report #33)		
Monitoring Program Evaluation	PE-111578 contact water, non-contact water and initial dilution zone monitoring stations have not been fully established.	The PE-111578 authorized works were under construction during the reporting period. Monitoring stations are progressively established as water management infrastructure is completed. The East Sedimentation Pond and East WWTP are completed, and pilot testing of the East WWTP is ongoing. The East Sedimentation Pond was commissioned for discharge on April 15. The West Sedimentation Pond is complete, except the outfall structure and West WWTP is undergoing pilot testing. The West Sedimentation Pond is not commissioned for 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. This item remains open.
Monitoring Program Evaluation	Sampling was not conducted as prescribed in PE-111578 on occasion.	Field measurements and analytical samples were not collected as per the monitoring requirements in PE-111578 at SP-E-OUT (September 25) and the West WWTP influent and effluent stations during the monitoring period. A follow-up investigation has been initiated with the QEP. In September, OUT-01, OUT-02, and OUT-06 were not sampled as there was no flowing water at the time of monitoring. Monthly sampling requirements for OUT-11 were met except for methylmercury. A follow-up investigation has been initiated with the QEP. This item remains open.
Pending Data	Analytical results for samples collected September 24, 27 and 28 were not reported.	Analytical results for samples collected September 24, 27 (SP-W-E only), and 28 were not complete at the time of Report #33 preparation. The pending results will be included in future weekly reports when available. This item remains open.
	Methylmercury, dioxins and furans results were not reported for samples collected September 23.	Analytical results for methylmercury, dioxins and furans were not complete at the time of Report #33 preparation for samples collected September 23. Testing of methylmercury, dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
Data QC	Raised detection limits for methylmercury have been reported due to method blank contamination observed during analytical testing.	The reported detection limit for methylmercury has been raised above the routine detection limit in some samples due to method blank contamination observed during the analytical testing. An investigation into the root cause has been initiated. Reanalysis of samples that were affected by the raised detection limits have been requested to achieve the typically reported detection limits for methylmercury, however this results in reporting delays. The pending results will be included in future weekly reports when available. This item remains open.
Ongoing Items from Previous Weekly Reports		
Report #27: Sample Integrity	Dioxin and furans could not be tested in the July 19 IDZ-E1 sample from 2 m below surface.	The laboratory reports that the sample bottles for dioxin and furans were broken during trans-shipment between testing facilities while the sample was under laboratory custody, therefore results for this sample are not available. Root cause investigation by the laboratory concluded proper packing techniques were implemented to prevent damage while in transit (i.e., double bagged in bubble wrap, hard sided coolers filled with packing material, and fragile stickers affixed to the shipments), and the bottles were damaged while in the care of the courier company responsible for transporting the samples between testing facilities. The laboratory filed a complaint with the courier company. This item remains is closed.
Report #28: Pending Data	Analytical results for samples collected August 21 and 23 were not reported.	Available analytical results for samples collected August 21 are discussed in Sections 3.3 and 3.4 of Report #29 and dioxins and furans results are discussed in Sections 3.3 and 3.4 of Report #32. Available analytical results for samples collected August 23 are discussed in Section 3.9 of Report #30 and results for dioxins and furans are discussed in Section 3.9 of Report #33. Analytical results for methylmercury were not complete at the time of Report #33 preparation as a reanalysis has been requested. The pending results will be included in future weekly reports when available. This item remains open.
Report #29: Pending Data	Analytical results for samples collected at marine reference stations on August 26 and the estuarine receiving environment on August 28 were not reported.	Available analytical results for samples collected from the marine reference stations on August 26 and the estuarine receiving environment station on August 28 are discussed in Sections 3.9 and 3.8 of Report #31, respectively. Dioxins and furans results are discussed in Sections 3.8 and 3.9 of Report #33. Analytical results for methylmercury were not complete at the time of Report #33 preparation. Testing of methylmercury typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
Report #29: Pending Data	Methylmercury, dioxins and furans results for samples collected August 26 – 29 were not reported.	Methylmercury results are discussed in Sections 3.4 and 3.6 of Report #30. Analytical results for dioxins and furans were not complete at the time of Report #33 preparation for samples collected August 26, 27, 28, and 29. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
Report #30: Pending Data	Dioxins and furans results for samples collected September 2 and 4 were not reported.	Analytical results for dioxins and furans were not complete at the time of Report #33 preparation for samples collected September 2 and 4. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
Report #31: Pending Data	Methylmercury, dioxins and furans results for samples collected September 8, 11, and 13 were not reported.	Methylmercury results for samples collected September 8 and 11 are discussed in Sections 3.3, 3.4, and 3.6 of Report #32. Analytical results for methylmercury for samples collected September 13 are discussed in Section 3.6 of Report #33. Results for dioxins and furans for samples collected September 8, 11, and 13 were not complete at the time of Report #33 preparation. Testing of methylmercury, dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
Report #32: Pending Data	Analytical results were not reported for samples collected September 18, 19 and 21.	Available analytical results for samples collected September 18 and 21 are discussed in Sections 3.9 and 3.6 of Report #33, respectively. Analytical results for samples collected September 19 were not complete at the time of Report #33 preparation. Analytical results for methylmercury, dioxins and furans were not complete at the time of Report #33 preparation. Testing of methylmercury typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.
	Dioxins and furans for the sample collected September 17 were not reported.	Analytical results for dioxins and furans for the SP-E-OUT sample collected September 17 were not complete at the time of Report #33 preparation. Testing of dioxins and furans typically requires up to 4 weeks to complete. The pending results will be included in future weekly reports when available. This item remains open.

Notes:

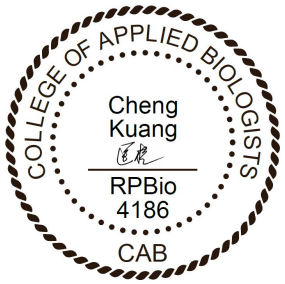
Result QA/QC screening includes the evaluation of field and lab QC results, comparison of total and dissolved metal results and review for modified detection limits.
Pending data are outstanding results from monitoring samples reported in the current or previous weekly reports.
Monitoring program evaluation is an assessment of the completeness of the monitoring program compared to PE-111578 specified or implied requirements.
WWTP performance evaluation is an assessment of WWTP effluent quality compared to operational MDOs.
Data review under QC Procedure indicates an evaluation of data trends or inter-parameter relationships that suggest a test result may not be representative of water quality at the time of monitoring.

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.



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LEGEND

- Freshwater Monitoring Station
- Marine Water Monitoring Station
- Certified Project Area
- Watercourse
- Non Contact Ditch (Under Construction)
- Outfall
- Clean Water Diversion Discharge Station
- Sediment Pond Monitoring Stations (Water Quality)
- Wastewater Treatment Plant (WWTP)

DATE SAVED:	Oct 03, 2024
DRAWN BY:	DM
REVIEWED:	PM
VERSION:	1

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

1:6,000

0 50 100 150 Metres

CLIENT: Woodfibre LNG

LORAX ENVIRONMENTAL

PROJECT:

Woodfibre LNG Project Construction Phase

TITLE:
Completed or Under Construction Water Management Facilities and Established PE-111578 Monitoring Stations (September 28, 2024)

PROJECT #: A633-7

FIGURE: 1

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Figure 1 Monitoring and Compliance Locations

Appendix A: East and West Catchment Photographs

Figure 2: East Catchment dewatering areas. Contact water from the 1100, 1200C, 1300, 4100, and 4200 Areas was directed to the East WWTP during the monitoring period (September 22 – 28).

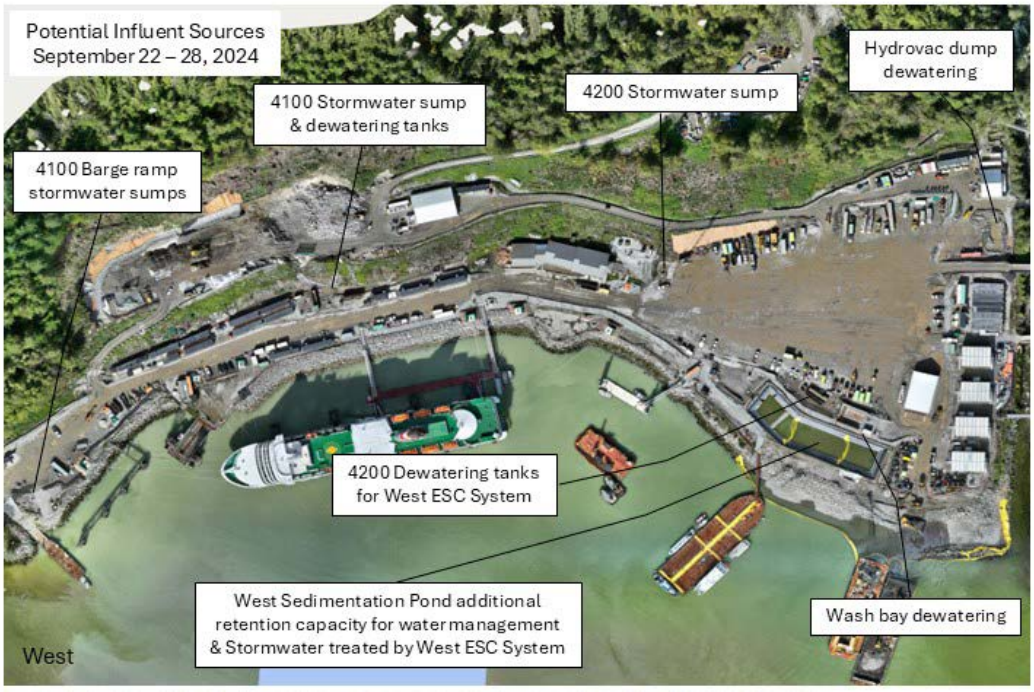

Figure 3: West Catchment dewatering areas. Contact water from the 4100 and 4200 Areas was directed to the West WWTP during the monitoring period (September 22 – 28).

Figure 4: Aerial view of the East Sedimentation Pond showing the placement of two sediment curtains (September 27, 2024). The East WWTP is located on the left side of the pond.

Figure 5: Aerial view of the West Sedimentation Pond showing the placement of two sediment curtains (September 27, 2024). The West WWTP is located on the right side of the pond.

Appendix B: East Sedimentation Pond Results

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

Parameter	Unit	Lowest Applicable Guideline [1]		PE-111578 Discharge Limit	East Sedimentation Pond			
					In-Pond at Effluent Location	In-Pond at Influent Location	In-Pond at Effluent Location	In-Pond at Effluent Location
					SP-E-NE	SP-E-NW	SP-E-NE	SP-E-NE
					VA24C5123-003	VA24C5123-004	VA24C5554-003	VA24C5869-003
		Long Term	Short Term		2024-09-23 11:30	2024-09-23 11:55	2024-09-25 16:33	2024-09-27 16:50
General Parameters								
pH - Field	pH units	- [2]	-	5.5 - 9.0	6.7	8.3	7.0	6.5
Conductivity - Field	µS/cm	-	-	-	1325	1058	1255	1119
Temperature - Field	°C	-	-	-	18.2	18.0	17.5	17.6
Salinity - Field	ppt	-	-	-	0.77	0.61	0.74	0.65
Turbidity - Field	NTU	-	-	-	5.95	10.90	7.51	8.4
TSS	mg/L	-	-	25	7.6	<3.0	4.8	<3.0
Dissolved Oxygen - Field	mg/L	>=8	-	-	***6.67***	***4.87***	***7.96***	***6.67***
Anions and Nutrients								
Sulphate	mg/L	-	-	-	64.9	47.9	54.2	44.6
Chloride	mg/L	-	-	-	75.8	87.4	57.2	38.1
Fluoride	mg/L	-	1.5	-	0.211	0.296	0.154	<0.100
Ammonia (N-NH_3)	mg/L	Variable [3]	Variable [3]	-	0.0066	<0.0050	0.0077	<0.0050
Nitrite (N-NO_2)	mg/L	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Nitrate (N-NO_3)	mg/L	3.7	339	-	<0.0250	<0.0250	0.0439	0.163
Total Metals								
Aluminum, total (T-Al)	mg/L	-	-	-	0.309	0.445	0.301	0.184
Antimony, total (T-Sb)	mg/L	-	0.27 [4]	-	0.00189	0.00134	0.00233	0.00346
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00208	0.00385	0.0027	0.0035
Barium, total (T-Ba)	mg/L	-	-	-	0.0071	0.0154	0.00504	0.0035
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.000100	<0.000100	<0.000100	<0.000100
Boron, total (T-B)	mg/L	1.2	-	-	0.084	0.1	0.091	0.024
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	<0.0000250	0.000033	<0.0000150	<0.0000100
Chromium, total (T-Cr)	mg/L	-	-	-	<0.00100	0.00054	<0.00100	0.00102
Cobalt, total (T-Co)	mg/L	-	-	-	<0.00020	0.00016	<0.00020	<0.00020
Copper, total (T-Cu)	mg/L	- [2]	- [2]	0.0043	0.00132	0.00319	0.00173	0.00109
Iron, total (T-Fe)	mg/L	-	-	-	0.351	0.274	0.134	0.073
Lead, total (T-Pb)	mg/L	- [2]	- [2]	0.0035	0.00057	0.00103	0.000583	0.000362
Manganese, total (T-Mn)	mg/L	-	-	-	0.00498	0.0201	0.00496	0.00268
Mercury, total (T-Hg)	mg/L	0.000016 [5]	-	-	<0.0000050	0.0000065	<0.0000050	<0.0000050
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0692	0.067	0.0621	0.0485
Nickel, total (T-Ni)	mg/L	0.0083	-	-	<0.00100	0.00055	<0.00100	<0.00100
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000159	0.000216	0.000228	0.000306
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.000020	<0.000010	<0.000020	<0.000020
Thallium, total (T-Tl)	mg/L	-	-	-	<0.000020	<0.000010	<0.000020	<0.000020
Uranium, total (T-U)	mg/L	-	-	-	0.0554	0.0318	0.0434	0.0253
Vanadium, total (T-V)	mg/L	- [2]	-	0.0081	0.00436	0.00557	0.00571	0.00513
Zinc, total (T-Zn)	mg/L	- [2]	- [2]	0.0133	0.0067	0.0068	<0.0060	<0.0060
Hexavalent Chromium, total	mg/L	0.0015	-	-	<0.00050	<0.00050	0.00052	0.00068
Dissolved Metals								
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	<0.0000250	0.0000238	<0.0000150	<0.0000100
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00085	0.0021	0.00115	0.00084
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.020	0.04	<0.020	<0.020
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.000100	0.000322	<0.000100	<0.000100
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00192	0.0106	0.0017	0.00106
Nickel, dissolved (D-Ni)	mg/L	-	-	-	<0.00100	<0.00050	<0.00100	<0.00100
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.0828	0.0947	0.0522	0.0376
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00371	0.00443	0.00489	0.00495
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0023	0.0036	<0.0020	<0.0020
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	mg/L	0.006	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Acridine	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Anthracene	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chrysene	mg/L	0.0001	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Fluoranthene	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	0.012	-	-	<0.000010	<0.000010	<0.000010	<0.000010
1-methylnaphthalene	mg/L	0.001	-	-	<0.000010	<0.000010	<0.000010	<0.000010
2-methylnaphthalene	mg/L	0.001	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Naphthalene	mg/L	0.001	-	-	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020
Pyrene	mg/L	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Quinoline	mg/L	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050
Volatile Organic Compounds (VOCs)								
Benzene	mg/L	0.11	-	-	-	-	-	-
Ethylbenzene	mg/L	0.25	-	-	-	-	-	-
Methyl-tert-butyl-ether	mg/L	5	0.44	-	-	-	-	-
Styrene	mg/L	-	-	-	-	-	-	-
Toluene	mg/L	0.215	-	-	-	-	-	-
Total Xylenes	mg/L	-	-	-	-	-	-	-
Chlorobenzene	mg/L	0.025	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.042	-	-	-	-	-	-

Notes: Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
Results in orange text exceeded the PE-11578 East Sedimentation Pond Discharge Limit.
The East Sedimentation Pond discharged during the monitoring period (September 15 – 21) on September 17.
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The BC WQG for total ammonia is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ≤0.5% of total Hg, the BC WQG = 0.00002 mg/L. The Canadian WQG = 0.000016 mg/L.

Table B-2: Summary of East Sedimentation Pond Daily Field Parameters September 22 – 28.

Parameter		Temperature	Dissolved Oxygen (DO)	Salinity	Turbidity	pH	Conductivity	Visibility of Sheen	Total Daily Discharge from the East Sedimentation Pond to Howe Sound
Unit		**°C**	**mg/L**	**ppt**	**NTU**	**s.u.**	**µS/cm**		**m^3**
PE-111578 Discharge Limit		-	-	-	-	5.5 - 9.0	-	-	-[3]
Lowest Applicable Guideline [1]		-	>=8	-	-	-[2]	-	-	-
Station ID [4]	**Date**								
SP-E-NW	2024-09-22 16:49	18.1	***7.39***	0.71	6.57	7.0	1232	No	0
SP-E-NE	2024-09-22 17:12	17.5	***7.12***	0.63	8.20	8.4	1080	No	
SP-E-NE	2024-09-23 11:38	18.2	***6.67***	0.77	5.95	6.7	1325	No	0
SP-E-NW	2024-09-23 11:54	18.0	***4.87***	0.61	10.9	8.3	1058	No	
SP-E-NW	2024-09-24 15:51	20.8	***6.34***	0.62	7.80	8.1	1147	No	0
SP-E-NE	2024-09-24 15:59	20.4	8.60	0.81	3.85	7.0	1467	No	
SP-E-NW	2024-09-25 8:31	17.9	***4.70***	0.58	6.65	7.8	1005	No	213
SP-E-NE	2024-09-25 16:33	17.5	***7.96***	0.74	7.51	7.0	1255	No	
SP-E-NE	2024-09-26 16:56	16.0	***6.69***	0.70	9.56	7.4	1146	No	0
SP-E-NW	2024-09-26 17:07	15.4	***5.20***	0.53	8.82	8.2	875	No	
SP-E-NW	2024-09-27 0:00	18.1	***5.47***	0.52	10.6	8.3	913	No	0
SP-E-NE	2024-09-27 16:50	17.6	***6.67***	0.65	8.40	6.5	1119	No	
SP-E-NE	2024-09-28 10:55	15.7	***6.54***	0.56	1.51	6.9	926	No	0

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 PE-11578 East Sedimentation Pond Discharge Limit.
All SP-E-OUT samples collected from May 27 to the time of writing were taken from the sample port which is located near the inlet end of the temporary discharge hose.
The East Sedimentation Pond discharged during the monitoring period (September 22 – 28) on September 25.
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The annual average authorized discharge rate from the East Sedimentation Pond is 650 m^3/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.
[4] The sedimentation pond did not receive non-contaminated contact water influent September 22 – 28, therefore daily measurements for station SP-E-IN-2 were not collected. The East Sedimentation Pond discharged on September 25, however daily field measurements and an analytical sample were not collected. A follow-up investigation has been initiated with the QEP on record. The East Sedimentation Pond did not discharge September 22 – 24 and 26 – 28, therefore daily measurements for station SP-E-OUT were not collected. 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	Operational Minimum Discharge Objective [1]	East WWTP					
			Influent	Effluent	Influent	Effluent	Influent	Effluent
			WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT	WWTP-E-IN	WWTP-E-OUT
			VA24C5123-002	VA24C5123-001	VA24C5554-001	VA24C5554-002	VA24C5869-001	VA24C5869-002
			2024-09-23 11:15	2024-09-23 12:05	2024-09-25 16:22	2024-09-25 16:02	2024-09-27 16:45	2024-09-27 17:00
General Parameters								
pH - Field	pH units	5.5 – 9.0	6.7	6.5	7.0	7.0	6.5	6.9
Conductivity - Field	µS/cm	-	1327	1351	1282	1202	1172	1094
Temperature - Field	℃	-	18.3	18.2	17.9	17.4	17.8	16.9
Salinity - Field	ppt	-	0.77	0.78	0.35	0.71	0.66	0.65
Turbidity - Field	NTU	-	3.87	2.12	3.77	2.09	8.39	6.03
TSS	mg/L	-	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Dissolved Oxygen - Field	mg/L	-	6.83	6.98	6.65	5.90	6.62	5.66
Anions and Nutrients								
Sulphate	mg/L	-	64.8	64.5	57.3	56.9	44.8	44.3
Chloride	mg/L	-	75.7	76	62.2	54.7	38.1	35.8
Fluoride	mg/L	-	0.208	0.214	0.174	0.142	<0.100	<0.100
Ammonia ($N\text{-}NH_3$)	mg/L	-	0.0062	0.0085	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite ($N\text{-}NO_2$)	mg/L	-	<0.0050	<0.0050	0.0091	<0.0050	<0.0050	<0.0050
Nitrate ($N\text{-}NO_3$)	mg/L	-	<0.0250	0.0308	0.0297	0.0739	0.163	0.216
Total Metals								
Aluminum, total (T-Al)	mg/L	-	0.099	0.0932	0.189	0.121	0.126	0.0706
Antimony, total (T-Sb)	mg/L	-	0.00196	0.00185	0.00226	0.0027	0.00352	0.00362
Arsenic, total (T-As)	mg/L	0.0125	0.00203	0.00195	0.00263	0.00287	0.00365	0.00356
Barium, total (T-Ba)	mg/L	-	0.00606	0.00549	0.00449	0.00311	0.00352	0.00282
Beryllium, total (T-Be)	mg/L	0.1	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Boron, total (T-B)	mg/L	1.2	0.085	0.081	0.092	0.093	0.022	<0.020
Cadmium, total (T-Cd)	mg/L	0.00012	<0.0000250	<0.0000200	<0.0000250	<0.0000150	<0.0000100	<0.0000100
Chromium, total (T-Cr)	mg/L	-	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cobalt, total (T-Co)	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Copper, total (T-Cu)	mg/L	0.0043	0.00184	0.00233	***0.00489***	***0.00559***	0.00145	<0.00100
Iron, total (T-Fe)	mg/L	-	<0.020	<0.020	0.058	<0.020	0.029	<0.020
Lead, total (T-Pb)	mg/L	0.0035	0.000266	0.000134	0.00127	0.000332	0.000205	<0.000100
Manganese, total (T-Mn)	mg/L	-	0.00178	0.00048	0.00323	0.00063	0.00136	<0.00020
Mercury, total (T-Hg)	mg/L	0.000016	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum, total (T-Mo)	mg/L	-	0.0706	0.0694	0.063	0.0632	0.0490	0.0477
Nickel, total (T-Ni)	mg/L	0.0083	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Selenium, total (T-Se)	mg/L		0.000246	0.000207	0.00026	0.000251	0.000257	0.000266
Silver, total (T-Ag)	mg/L	0.0015	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Thallium, total (T-Tl)	mg/L	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Uranium, total (T-U)	mg/L	-	0.0539	0.0529	0.0452	0.0414	0.0244	0.0238
Vanadium, total (T-V)	mg/L	0.0081	0.00400	0.00409	0.00550	0.00531	0.00516	0.00436
Zinc, total (T-Zn)	mg/L	0.0133	<0.0060	0.0106	***0.0560***	0.0074	<0.0060	<0.0060
Hexavalent Chromium, total	mg/L	0.0015	<0.00050	<0.00050	0.00055	0.00063	0.00076	0.00083
Dissolved Metals								
Cadmium, dissolved (D-Cd)	mg/L	0.00012	<0.0000250	<0.0000200	<0.0000150	<0.0000150	<0.0000100	<0.0000100
Copper, dissolved (D-Cu)	mg/L	-	0.00129	0.00104	0.00166	0.00175	0.00114	0.00124
Iron, dissolved (D-Fe)	mg/L	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Lead, dissolved (D-Pb)	mg/L	-	0.000196	<0.000100	0.000253	0.00016	0.000151	0.000146
Manganese, dissolved (D-Mn)	mg/L	-	0.00151	0.00033	0.00176	0.00117	0.0009	0.00138
Nickel, dissolved (D-Ni)	mg/L	-	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Strontium, dissolved (D-Sr)	mg/L	-	0.0872	0.0816	0.0547	0.0457	0.0366	0.0412
Vanadium, dissolved (D-V)	mg/L	-	0.00384	0.00371	0.00517	0.00484	0.00466	0.00412
Zinc, dissolved (D-Zn)	mg/L	-	0.0041	0.0038	0.0063	0.0235	0.0035	0.0181
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Acridine	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Anthracene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(a)pyrene	mg/L	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chrysene	mg/L	0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Fluoranthene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	0.012	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
1-methylnaphthalene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Naphthalene	mg/L	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Pyrene	mg/L	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Quinoline	mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Volatile Organic Compounds (VOCs)								
Benzene	mg/L	0.11	<0.00050	<0.00050	-	-	-	-
Ethylbenzene	mg/L	0.25	<0.00050	<0.00050	-	-	-	-
Methyl-tert-butyl-ether	mg/L	0.44	<0.00050	<0.00050	-	-	-	-
Styrene	mg/L	-	<0.00050	<0.00050	-	-	-	-
Toluene	mg/L	0.215	<0.00040	<0.00040	-	-	-	-
Total Xylenes	mg/L	-	<0.00050	<0.00050	-	-	-	-
Chlorobenzene	mg/L	-	<0.00050	<0.00050	-	-	-	-
1,2-Dichlorobenzene	mg/L	-	<0.00050	<0.00050	-	-	-	-

Notes:
[1] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Table C-2: Summary of East Wastewater Treatment Plant Daily Field Parameters September 22 – 28.

Parameter		**Temperature**	**Dissolved Oxygen (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^3**
PE-111578 Discharge Limit [1]		-	-	-	-	-	-	-	1,100
Minimum Discharge Objective [2]		-	-	-	-	5.5 – 9.0	-	-	-
Station ID	**Date**								
WWTP-E-IN	2024-09-22 16:43	18.0	7.47	0.70	5.41	7.0	1212	No	-
WWTP-E-OUT	2024-09-22 17:18	18.0	7.63	0.76	5.89	6.5	1304	No	655
WWTP-E-IN	2024-09-23 11:22	18.2	6.98	0.78	2.12	6.52	1351	No	-
WWTP-E-OUT	2024-09-23 11:25	18.3	6.83	0.77	3.87	6.7	1327	No	610
WWTP-E-IN	2024-09-24 15:57	20.5	8.08	0.82	3.55	6.9	1476	No	-
WWTP-E-OUT	2024-09-24 15:45	19.9	6.02	0.83	2.45	6.5	1485	No	551
WWTP-E-IN	2024-09-25 16:22	17.9	6.65	0.35	3.77	7.0	1282	No	-
WWTP-E-OUT	2024-09-25 16:02	17.4	5.90	0.71	2.09	7.0	1202	No	648
WWTP-E-IN	2024-09-26 17:01	15.9	6.79	0.71	7.71	7.4	1162	No	-
WWTP-E-OUT	2024-09-26	15.8	7.54	0.69	4.91	7.5	1137	No	228
WWTP-E-IN	2024-09-27 16:45	17.8	6.62	0.66	8.39	6.5	1172	No	-
WWTP-E-OUT	2024-09-27 17:00	16.9	5.66	0.65	6.03	6.9	1094	No	587
WWTP-E-IN	2024-09-28 11:13	16.0	6.10	0.58	1.99	6.9	1125	No	-
WWTP-E-OUT	2024-09-28 10:34	15.9	4.50	0.65	0.55	6.2	914	No	576

Notes:
[1] PE-111578 East WWTP Discharge Limit is applied to effluent compliance station WWTP-E-OUT.
[2] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
Results ***underlined in bold italics*** do not meet the applicable minimum discharge objective (except DO).

Appendix D: West Sedimentation Pond Results

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

Parameter	Unit	Lowest Applicable Guideline [1]		PE-111578 Discharge Limit	West Sedimentation Pond
					In-Pond at Effluent Location
					SP-W-E
					VA24C5718-003
		Long Term	Short Term		2024-09-26 13:51
General Parameters					
pH - Field	pH units	- [2]	-	5.5 - 9.0	8.2
Conductivity - Field	µS/cm	-	-	-	1471
Temperature - Field	°C	-	-	-	15.6
Salinity - Field	ppt	-	-	-	0.91
Turbidity - Field	NTU	-	-	-	5.37
TSS	mg/L	-	-	25	<3.0
Dissolved Oxygen - Field	mg/L	>=8	-	-	8.49
Anions and Nutrients					
Sulphate	mg/L	-	-	-	43.6
Chloride	mg/L	-	-	-	122
Fluoride	mg/L	-	1.5	-	<0.200
Ammonia (N-NH_3)	mg/L	Variable [3]	Variable [3]	-	0.0066
Nitrite (N-NO_2)	mg/L	-	-	-	<0.0100
Nitrate (N-NO_3)	mg/L	3.7	339	-	0.0673
Total Metals					
Aluminum, total (T-Al)	mg/L	-	-	-	0.366
Antimony, total (T-Sb)	mg/L	-	0.27 [4]	-	0.00192
Arsenic, total (T-As)	mg/L	0.0125	0.0125	-	0.00136
Barium, total (T-Ba)	mg/L	-	-	-	0.00892
Beryllium, total (T-Be)	mg/L	0.1	-	-	<0.000100
Boron, total (T-B)	mg/L	1.2	-	-	<0.020
Cadmium, total (T-Cd)	mg/L	0.00012	-	-	0.0000379
Chromium, total (T-Cr)	mg/L	-	-	-	<0.00100
Cobalt, total (T-Co)	mg/L	-	-	-	<0.00020
Copper, total (T-Cu)	mg/L	- [2]	- [2]	0.0043	0.00213
Iron, total (T-Fe)	mg/L	-	-	-	0.163
Lead, total (T-Pb)	mg/L	- [2]	- [2]	0.0035	0.000652
Manganese, total (T-Mn)	mg/L	-	-	-	0.00624
Mercury, total (T-Hg)	mg/L	0.000016 [5]	-	-	0.0000082
Molybdenum, total (T-Mo)	mg/L	-	-	-	0.0218
Nickel, total (T-Ni)	mg/L	0.0083	-	-	0.00152
Selenium, total (T-Se)	mg/L	0.002	-	-	0.000123
Silver, total (T-Ag)	mg/L	0.0015	0.003	-	<0.000020
Thallium, total (T-Tl)	mg/L	-	-	-	<0.000020
Uranium, total (T-U)	mg/L	-	-	-	0.0089
Vanadium, total (T-V)	mg/L	- [2]	-	0.0081	0.00233
Zinc, total (T-Zn)	mg/L	- [2]	- [2]	0.0133	0.0086
Hexavalent Chromium, total	mg/L	0.0015	-	-	<0.00050
Dissolved Metals					
Cadmium, dissolved (D-Cd)	mg/L	-	-	-	0.0000138
Copper, dissolved (D-Cu)	mg/L	-	-	-	0.00058
Iron, dissolved (D-Fe)	mg/L	-	-	-	<0.020
Lead, dissolved (D-Pb)	mg/L	-	-	-	<0.000100
Manganese, dissolved (D-Mn)	mg/L	-	-	-	0.00093
Nickel, dissolved (D-Ni)	mg/L	-	-	-	<0.00100
Strontium, dissolved (D-Sr)	mg/L	-	-	-	0.0163
Vanadium, dissolved (D-V)	mg/L	-	-	-	0.00182
Zinc, dissolved (D-Zn)	mg/L	-	-	-	0.0024
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	mg/L	0.006	-	-	0.000027
Acridine	mg/L	-	-	-	<0.000010
Anthracene	mg/L	-	-	-	<0.000010
Benz(a)anthracene	mg/L	-	-	-	<0.000010
Benzo(a)pyrene	mg/L	0.00001	-	-	<0.0000050
Chrysene	mg/L	0.0001	-	-	<0.000010
Fluoranthene	mg/L	-	-	-	<0.000010
Fluorene	mg/L	0.012	-	-	0.000026
1-methylnaphthalene	mg/L	0.001	-	-	0.000014
2-methylnaphthalene	mg/L	0.001	-	-	0.000022
Naphthalene	mg/L	0.001	-	-	0.000074
Phenanthrene	mg/L	-	-	-	0.000028
Pyrene	mg/L	-	-	-	<0.000010
Quinoline	mg/L	-	-	-	<0.000050
Volatile Organic Compounds (VOCs)					
Benzene	mg/L	0.11	-	-	-
Ethylbenzene	mg/L	0.25	-	-	-
Methyl-tert-butyl-ether	mg/L	5	0.44	-	-
Styrene	mg/L	-	-	-	-
Toluene	mg/L	0.215	-	-	-
Total Xylenes	mg/L	-	-	-	-
Chlorobenzene	mg/L	0.025	-	-	-
1,2-Dichlorobenzene	mg/L	0.042	-	-	-

Notes: Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
Results in orange text exceeded the PE-11578 West Sedimentation Pond Discharge Limit.
The West Sedimentation Pond did not discharge during the monitoring period (September 22 – 28).
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The BC WQG for total ammonia is salinity, pH and temperature dependent; see Tables 26E and 26F in BC WQG guidance document.
[4] The working BC WQG for trivalent antimony [SB(III)] is 0.27 mg/L and is applied to total antimony results.
[5] When MeHg ≤0.5% of total Hg, the BC WQG = 0.00002 mg/L. The Canadian WQG = 0.000016 mg/L.

Table D-2: Summary of West Sedimentation Pond Daily Field Parameters September 22 – 28.

Parameter		**Temperature**	**Dissolved Oxygen (DO)**	**Salinity**	**Turbidity**	**pH**	**Conductivity**	**Visibility of Sheen**	**Total Daily Discharge from the West Sedimentation Pond to Howe Sound**
Unit		**°C**	**mg/L**	**ppt**	**NTU**	**s.u.**	**µS/cm**		**m^3**
PE-111578 Discharge Limit		-	-	-	-	5.5 - 9.0	-	-	-[3]
Lowest Applicable Guideline [1]		-	>=8	-	-	-[2]	-	-	-
Station ID [4]	**Date**								
SP-W-E	2024-09-25 8:46	17.8	***3.60***	1.06	4.46	7.5	1775	No	0
SP-W-W	2024-09-25 9:14	17.9	***6.81***	1.13	17.8	7.4	1890	No	
SP-W-W	2024-09-26 10:15	-[5]	-[5]	-[5]	8.01	8.0	-[5]	No	0
SP-W-E	2024-09-26 13:51	15.6	8.49	0.91	5.37	8.2	1471	No	
SP-W-E	2024-09-27 0:00	15.6	6.57	0.85	11.8	9.3	1380	No	0
SP-W-E	2024-09-28 12:03	15.3	***7.77***	0.84	8.13	8.9	1354	No	0

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 PE-11578 West Sedimentation Pond Discharge Limit.
The West Sedimentation Pond did not discharge during the monitoring period (September 22 – 28).
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] The WQG was not evaluated for parameters with discharge limits.
[3] The annual average authorized discharge rate from the West Sedimentation Pond is 310 m^3/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.
[4] In-pond monitoring stations have been established for the West Sedimentation Pond at locations SP-W-W and SP-W-E and are used for pond water quality monitoring during the West WWTP pilot trials.
[5] Only field measurements for pH and turbidity were recorded at station SP-W-W on September 26.

Appendix E: West Wastewater Treatment Plant Results

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

Parameter	Unit	Operational Minimum Discharge Objective [1]	West WWTP	
			Influent	Effluent
			WWTP-W-IN	WWTP-W-OUT
			VA24C5087-002	VA24C5087-001
			2024-09-21 16:00	2024-09-21 17:15
General Parameters				
pH - Field	pH units	5.5 – 9.0	7.3	7.0
Conductivity - Field	µS/cm	-	1796	2068
Temperature - Field	℃	-	21.8	20.3
Salinity - Field	ppt	-	0.97	1.17
Turbidity - Field	NTU	-	8.26	-[2]
TSS	mg/L	-	9.2	4.0
Dissolved Oxygen - Field	mg/L	-	6.73	5.46
Anions and Nutrients				
Sulphate	mg/L	-	59.6	57.8
Chloride	mg/L	-	175	174
Fluoride	mg/L	-	<0.200	<0.400
Ammonia ($N\text{-}NH_3$)	mg/L	-	<0.0050	<0.0050
Nitrite ($N\text{-}NO_2$)	mg/L	-	<0.0100	<0.0200
Nitrate ($N\text{-}NO_3$)	mg/L	-	<0.0500	<0.100
Total Metals				
Aluminum, total (T-Al)	mg/L	-	0.408	0.701
Antimony, total (T-Sb)	mg/L	-	0.00274	0.00256
Arsenic, total (T-As)	mg/L	0.0125	0.00142	0.00128
Barium, total (T-Ba)	mg/L	-	0.0166	0.00266
Beryllium, total (T-Be)	mg/L	0.1	<0.000100	<0.000100
Boron, total (T-B)	mg/L	1.2	0.025	0.026
Cadmium, total (T-Cd)	mg/L	0.00012	0.0000321	<0.0000100
Chromium, total (T-Cr)	mg/L	-	<0.00100	<0.00100
Cobalt, total (T-Co)	mg/L	-	<0.00020	<0.00020
Copper, total (T-Cu)	mg/L	0.0043	0.00328	0.00193
Iron, total (T-Fe)	mg/L	-	0.301	0.046
Lead, total (T-Pb)	mg/L	0.0035	0.00154	0.000214
Manganese, total (T-Mn)	mg/L	-	0.00838	0.00093
Mercury, total (T-Hg)	mg/L	0.000016	<0.0000050	<0.0000050
Molybdenum, total (T-Mo)	mg/L	-	0.0222	0.0226
Nickel, total (T-Ni)	mg/L	0.0083	0.00249	0.00204
Selenium, total (T-Se)	mg/L		<0.000100	0.000161
Silver, total (T-Ag)	mg/L	0.0015	<0.000020	<0.000020
Thallium, total (T-Tl)	mg/L	-	<0.000020	<0.000020
Uranium, total (T-U)	mg/L	-	0.00916	0.0089
Vanadium, total (T-V)	mg/L	0.0081	0.00263	0.00153
Zinc, total (T-Zn)	mg/L	0.0133	***0.0221***	***0.0140***
Hexavalent Chromium, total	mg/L	0.0015	<0.00050	<0.00050
Dissolved Metals				
Cadmium, dissolved (D-Cd)	mg/L	0.00012	0.0000247	<0.0000100
Copper, dissolved (D-Cu)	mg/L	-	0.00152	0.0012
Iron, dissolved (D-Fe)	mg/L	-	0.044	<0.020
Lead, dissolved (D-Pb)	mg/L	-	0.000793	0.000124
Manganese, dissolved (D-Mn)	mg/L	-	0.00432	0.00068
Nickel, dissolved (D-Ni)	mg/L	-	0.00154	0.00137
Strontium, dissolved (D-Sr)	mg/L	-	0.0388	0.00622
Vanadium, dissolved (D-V)	mg/L	-	0.00172	0.00105
Zinc, dissolved (D-Zn)	mg/L	-	0.0134	0.0037
Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	mg/L	-	<0.000010	<0.000010
Acridine	mg/L	-	<0.000010	<0.000010
Anthracene	mg/L	-	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	<0.000010	<0.000010
Benzo(a)pyrene	mg/L	0.00001	<0.0000050	<0.0000050
Chrysene	mg/L	0.0001	<0.000010	<0.000010
Fluoranthene	mg/L	-	<0.000011	<0.000010
Fluorene	mg/L	0.012	0.000014	<0.000010
1-methylnaphthalene	mg/L	-	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	<0.000010	<0.000010
Naphthalene	mg/L	0.001	<0.000050	<0.000050
Phenanthrene	mg/L	-	<0.000026	<0.000020
Pyrene	mg/L	-	<0.000010	<0.000010
Quinoline	mg/L	-	<0.000050	<0.000050
Volatile Organic Compounds (VOCs)				
Benzene	mg/L	0.11	<0.00050	<0.00050
Ethylbenzene	mg/L	0.25	<0.00050	<0.00050
Methyl-tert-butyl-ether	mg/L	0.44	<0.00050	<0.00050
Styrene	mg/L	-	<0.00050	<0.00050
Toluene	mg/L	0.215	<0.00040	<0.00040
Total Xylenes	mg/L	-	<0.00050	<0.00050
Chlorobenzene	mg/L	-	<0.00050	<0.00050
1,2-Dichlorobenzene	mg/L	-	<0.00050	<0.00050

Notes:
[1] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
[2] A field turbidity measurement was not recorded for WWTP-W-OUT on September 21.
Results ***underlined in bold italics*** exceed the applicable minimum discharge objective.

Table E-2: Summary of West Wastewater Treatment Plant Water Quality Results for Methylmercury Received at the Time of Reporting.

Parameter	Unit	West WWTP	
		Influent	Effluent
		WWTP-W-IN	WWTP-W-OUT
		VA24C4105-001	VA24C4105-002
		2024-09-13	2024-09-13
Methylmercury	**µg/L**	0.000074	0.000024

Table E-3: Summary of West Wastewater Treatment Plant Daily Field Parameters September 22 – 28.

Parameter		**Temperature**	**Dissolved Oxygen (DO)**	**Salinity**	**Turbidity**	**pH**	**Conductivity**	**Visibility of Sheen**	**Total Daily Discharge from the West WWTP**
Unit		**°C**	**mg/L**	**ppt**	**NTU**	**s.u.**	**µS/cm**		**m^3**
PE-111578 Discharge Limit [1]		-	-	-	-	-	-	-	120
Minimum Discharge Objective [2]		-	-	-	-	5.5 – 9.0	-	-	-
Station ID	**Date**								
WWTP-W-IN	2024-09-22 16:21	17.8	8.54	1.02	8.50	7.3	1716	No	-
WWTP-W-OUT	2024-09-22 16:25	18.0	7.67	1.19	6.99	5.9	1995	No	28
WWTP-W-IN	2024-09-23 12:36	18.9	7.12	1.11	6.95	7.3	1906	No	-
WWTP-W-OUT	2024-09-23 12:41	19.2	6.37	1.20	3.75	7.0	2067	No	34
WWTP-W-IN	2024-09-24	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-
WWTP-W-OUT	2024-09-24	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	30
WWTP-W-IN	2024-09-25	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-
WWTP-W-OUT	2024-09-25	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	1.4
WWTP-W-IN	2024-09-26	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-
WWTP-W-OUT	2024-09-26	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	5.0
WWTP-W-IN	2024-09-27	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-
WWTP-W-OUT	2024-09-27	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	9.7
WWTP-W-IN	2024-09-28	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-
WWTP-W-OUT	2024-09-28	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]	7.9

Notes:
[1] PE-111578 West WWTP Discharge Limit is applied to effluent compliance station WWTP-W-OUT.
[2] Operational minimum discharge objectives (MDOs) for WWTP effluent that are listed in Appendix B of the Construction Wastewater Treatment Plant Operations Environmental Protection Plan dated February 7, 2024.
[3] Field measurements were collected each day during the monitoring period at the influent (WWTP-W-IN) and effluent (WWTP-W-OUT) stations except on September 24 – 28 as the West WWTP was not active at the time of monitoring.
Results ***underlined in bold italics*** do not meet the applicable minimum discharge objective (except DO).

Appendix F: Estuarine Water Receiving Environment Results

Table F-1: Summary of Estuarine Water Quality Results for Dioxins and Furans Received at the Time of Reporting.

Parameter	Unit	Station SW-03
		Mill Creek Estuary
		SW-03
		L2757229-1
		2024-08-28
Lower Bound PCDD/F TEQ	**pg/L**	0.0343
Upper Bound PCDD/F TEQ	**pg/L**	0.948

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).
Upper bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned the value of the detection limit.

Appendix G: Marine Water Receiving Environment Results

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

Parameter	Unit	Lowest Applicable Guideline [1]		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
				VA24C4987-001	VA24C4987-002	VA24C4987-003	VA24C4987-004	VA24C4987-005	VA24C4987-006
		Long Term	Short Term	2024-09-18 15:26	2024-09-18 15:26	2024-09-18 15:26	2024-09-18 15:13	2024-09-18 15:13	2024-09-18 15:13
General Parameters									
pH - Field	pH units	7.0 - 8.7	-	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
Specific Conductivity - Field	µS/cm	-	-	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
Temperature - Field	°C	-	-	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
Salinity - Field	ppt	Narrative[2]	-	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
Turbidity - Field	NTU	Narrative[2]	Narrative[2]	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]
TSS	mg/L	Narrative[2]	Narrative[2]	4.8	4.9	3.3	6.6	<2.4	<2.0
Dissolved Oxygen - Field	mg/L	>=8	-	-[3]	-[3]	-[3]	-[3]	-[3]	-[3]

Notes:
Results ***underlined in bold italics*** exceed the applicable long-term water quality guideline for the protection of marine water aquatic life.
Shaded results exceed the applicable short-term water quality guideline for the protection of marine water aquatic life.
[1] The lowest applicable guidelines from approved or working BC WQGs, Canadian (CCME) WQGs and Federal WQGs.
[2] 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 not discharging, therefore the guidelines were not evaluated.
[3] Field measurements were not collected from IDZ-E1 and IDZ-E2 on September 18 due to a field probe malfunction.

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

Parameter	Unit	Station IDZ-E1			Station IDZ-E2		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		IDZ-E1-0.5	IDZ-E1-2m	IDZ-E1-SF	IDZ-E2-0.5	IDZ-E2-2m	IDZ-E2-SF
		L2757159-1	L2757159-2	L2757159-3	L2757159-4	L2757159-5	L2757159-6
		2024-08-23	2024-08-23	2024-08-23	2024-08-23	2024-08-23	2024-08-23
Lower Bound PCDD/F TEQ	**pg/L**	0.00267	0.00378	0	0	0.00197	0
Upper Bound PCDD/F TEQ	**pg/L**	0.805	1.05	0.854	1.03	0.842	0.783

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).
Upper bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned the value of the detection limit.

Table G-3: Summary of Marine Water Quality Results for Dioxins and Furans Received at the Time of Reporting.

Parameter	Unit	Reference Station WQR1			Reference Station WQR2		
		0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor	0.5 m Below Surface	2 m Below Surface	2 m Above Seafloor
		WQR1-0.5	WQR1-2m	WQR1-SF	WQR2-0.5	WQR2-2m	WQR2-SF
		L2757210-1	L2757210-2	L2757210-3	L2757210-4	L2757210-5	L2757210-6
		2024-08-26	2024-08-26	2024-08-26	2024-08-26	2024-08-26	2024-08-26
Lower Bound PCDD/F TEQ	**pg/L**	0.00810	0.0158	0.00375	0	0	0
Upper Bound PCDD/F TEQ	**pg/L**	0.884	0.911	0.922	0.931	0.876	1.01

Notes:
PCDD = polychlorinated dibenzodioxins (dioxins)
PCDF = polychlorinated dibenzofurans (furans)
TEQ = toxic equivalency
Lower bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned a value of zero (0).
Upper bound PCDD/F TEQ is the sum of the toxic equivalency results for the individual PCDD/F parameters. Non-detectable parameters are assigned the value of the detection limit.