Core Area Wastewater Facilities

Environmental Monitoring Program - 2025 Report

Cycle 3 – Year 5

Capital Regional District | Parks, Recreation & Environmental Services, Environmental Protection

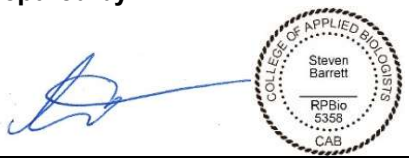


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CORE AREA WASTEWATER FACILITIES
ENVIRONMENTAL MONITORING PROGRAM
2025 REPORT

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CORE AREA WASTEWATER FACILITIES
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EXECUTIVE SUMMARY

The Capital Regional District (CRD) commissioned a new tertiary treatment plant and outfall at McLoughlin Point (McLoughlin) in 2020. Prior to this, the CRD discharged fine-screened municipal wastewater through two core area outfalls located at Macaulay Point (Macaulay) and Clover Point (Clover). Optimization of the treatment processes at McLoughlin was ongoing through 2022. Therefore, 2020 through 2022 were considered transitional years for both sewage treatment and the associated wastewater and receiving environment monitoring program in the Core Area. In the years since 2022, more stable plant operation has been achieved.

CRD staff have monitored quality of the wastewater, surface water and seafloor environments in the vicinity of the Macaulay and Clover outfalls since the late 1980s. The CRD shifted the focus of monitoring to McLoughlin in 2021; however, there is significant overlap with historical monitoring locations.

The CRD is required to monitor for compliance with the Municipal Wastewater Regulation (MWR) under the provincial *Environmental Management Act* and the Wastewater Systems Effluent Regulations (WSER) under the federal *Fisheries Act*.

In addition to regulatory compliance components, the CRD undertakes monitoring as outlined in the Core Area Liquid Waste Management Plan to assess the impacts of discharged sewage on the marine environment. This monitoring is done on a five-year cycle.

The 2025 Environmental Monitoring Program (EMP) report represents Year 5 of Cycle 3 and includes:

- Wastewater monitoring and analysis for conventional parameters, metals, other contaminants of concern substances and toxicity.
- Receiving environment monitoring, including surface water and water column analysis for bacteriological indicators, conventional parameters, metals and other priority substances (conducted quarterly at McLoughlin).
- Sediment chemistry, sediment toxicity, and mussel tissue chemistry (Clover Point).
- Crab and finfish survey for biological indicators, tissue bioaccumulation, and risk assessment (McLoughlin, Macaulay and Clover Point)
- Wet weather overflow and bypass sampling for bacteriological indicators indicating potential for human exposure to wastewater in the marine environment, and a subset of conventional parameters indicative of wastewater strength (conducted as needed at Macaulay and Clover, and shoreline overflow locations when bypass, overflow or wet weather events occurred).
- Additional investigations and research collaborations that address specific questions about water column and seafloor monitoring components and investigate emerging scientific issues regarding wastewater discharges and environmental effects.

RESULTS

The results presented in this report indicate risks to human health and the environment remain low based on contaminant concentrations outside of the initial dilution zone (IDZ). The implementation of tertiary treatment at McLoughlin has significantly reduced the contaminant concentrations and associated loadings to the marine receiving environment compared to the historical discharge from the Macaulay and Clover outfalls. These findings indicate that the low level of potential risks to human health and the environment has been further reduced.

During 2025, McLoughlin achieved a high-quality effluent with intermittent provincial regulatory exceedances. This was expected as Provincial effluent limits are exceptionally low relative to treatment plant design capabilities. In October 2025, the CRD applied to amend the effluent limits to align more closely with broader provincial environmental protection goals. In addition, source control and flow control measures in partnership with large private sector and CRD inputs such as the Hartland Residuals Treatment Facility and Hartland Landfill leachate effluent are being implemented to improve facility performance. There were no exceedances of federal regulatory limits in 2025.

The CRD received federal and provincial approval to temporarily bypass secondary and tertiary treatment processes at MPWWTP from March 26 to April 14, 2025, to complete essential maintenance and cleaning of the dirty backwash tank. The primary or partially secondary-treated wastewater effluent was discharged through the long outfall during this time. Based on historical monitoring and oceanographic modelling, environmental and human health impacts were expected to be low to moderate. The wastewater plume remained largely below the ocean surface with minimal potential for elevated bacterial levels at recreational sites, and no adverse effects observed at distant shellfish harvesting or shoreline locations.

Wet weather high flows, (defined as two times annual dry weather flow amounts) are predicted to occur up to 70 days per year resulting in discharge of blended primary and tertiary effluent from the McLoughlin outfall. In 2025, there were 23 days when effluent blending occurred in addition to the 20 days of secondary and tertiary treatment bypass between March 26 and April 14. Operators are continuing to refine internal flow balancing to ensure blending only happens when full tertiary treatment capacity is exceeded.

Surface water and water column sampling confirmed that the new McLoughlin outfall is performing as predicted by plume dispersion and dilution modelling. Bacteriological and other contaminant levels in the receiving environment were substantially lower than those observed when the Macaulay and Clover outfalls were in operation and remained below human health guidelines. These results further demonstrate environmental benefit of implementing tertiary treatment at McLoughlin Point.

The conveyance system is designed with numerous shoreline sanitary and combined sewer overflow and relief points that discharge during heavy rains, planned maintenance or following unexpected events. CRD staff conduct shoreline monitoring to assess human health risk for people engaged in recreational activities on beaches adjacent to the overflow locations. Shoreline samples were collected in response to ten reportable spills associated with one significant rainfall driven overflow event in December of 2025.

Seafloor monitoring conducted in 2025 included the finfish and crab study at McLoughlin Point and Macaulay Point and a sediment chemistry toxicity, and mussel investigation at Clover Point. Based on biological indicators and tissue concentration analyses, preliminary findings indicate that risks associated with the McLoughlin wastewater discharge are negligible to low. The final report was received from the consultant in October of 2026. Sediment chemistry, toxicity testing, and mussel sampling were carried out at Clover Point in 2025. The findings from these investigations will be evaluated as part of the Core Area Comprehensive Review, scheduled to commence in late 2026.

The CRD operates a regional water conservation program targeting residential and industrial/commercial/institutional sectors. The program has contributed to a per capita decrease in water demand since the mid-1990s despite an annual average population growth rate of 1.6%. The program was active in 2025 and included several water leak detection and monitoring technology initiatives.

ADDITIONAL INVESTIGATIONS AND RESEARCH

Additional investigations address specific questions or issues pertaining to the monitoring program, clarify aspects of the program, or provide concurrent data for the assessment of environmental effects. Some additional investigations are also requirements of the Liquid Waste Management Plan approval.

The CRD samples influent from the McLoughlin Wastewater Treatment Plant weekly for the BC Centre for Disease Control (BCCDC) and for the Public Health Agency of Canada. These groups are testing influent from McLoughlin and elsewhere in BC and Canada for COVID-19, respiratory syncytial virus (RSV) and

influenza trends. Results are available on the BCCDC and the Public Health Agency of Canada websites. Results are published by the Public Health Agency of Canada weekly. These findings help inform public health authority decision-making related to respiratory illness response.

The CRD continued participation in a second collaborative project with Biologica, University of Victoria and Metro Vancouver to develop an inexpensive benthos toxicogenomic tool that could be used in years when seafloor sampling does not take place. This tool could also be used at historical monitoring stations that have been abandoned. Once the tool has bee finalized, the CRD will work with Biologica to incorporate it into the routine monitoring program for future monitoring years.

Other additional investigations are under consideration for 2026, but have yet to be confirmed.

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Terms & Abbreviations

ADWF	Average Dry Weather Flow
BAF	Biological Aerated Filters
BCCDC	BC Centre for Disease Control
BOD	Biochemical Oxygen Demand
CALA	Canadian Association for Laboratory Accreditation Inc.
CBOD	Carbonaceous Biochemical Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
CFU	Colony-forming unit
Cl	Chloride
COD	Chemical Oxygen Demand
COND	Conductivity
CPS	Clover Pump Station
CRD	Capital Regional District
CSO	Combined sewer overflow
CTD	Conductivity-temperature-depth
ECCC	Environment and Climate Change Canada
eDNA	Environmental DNA
EMP	Environmental Monitoring Program
ENT	enterococci
ENV	BC Ministry of Environment and Parks
FC	Fecal Coliform
ICES	International Council for the Exploration of the Sea
ICI	Institutional, commercial, industrial water conservation program
IDZ	Initial Dilution Zone
LC50	Lethal Concentration 50
LTC	Long-term chronic
LWMP	Liquid Waste Management Program
MBBR	Moving Bed Biofilm Reactors
MPWWTP	McLoughlin Point Wastewater Treatment Plant
MLD	Megalitres per day
MMAG	Marine Monitoring Advisory Group
MPS	Macaulay Pump Station
MWR	Municipal Wastewater Regulation
NH_3	Ammonia
NO_2	Nitrite
NO_3	Nitrate
NP	Nonylphenols
NSERC	Natural Sciences and Engineering Research Council of Canada
OC	Organochlorine pesticides
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzo-p-dioxins
PDBE	Polybrominated diphenyl ethers
PFAS	Per- and poly-fluoroalkyl substances
PFOS	Perfluorooctane sulfonate
PICES	North Pacific Marine Science Organization
PPCP	Pharmaceuticals and personal care products
QA/QC	Quality assurance/quality control
SCADA	Supervisory Control and Data Acquisition

Terms & Abbreviations

SETAC	Society of Environmental Toxicology and Chemistry
SSAMEx	Salish Sea Ambient Monitoring Exchange
SSO	Sanitary sewer overflow
STA	Short-term acute
TDP	Total dissolved phosphorus
TKN	Total Kjeldahl nitrogen
TOC	Total organic carbon
TP	Total phosphorus
TSS	Total Suspended Solids
US EPA	US Environmental Protection Agency
UVIC	University of Victoria
WAD	Weak acid dissociable (WAD) cyanide
WMEP	Wastewater Marine Environment Program
WQG	Water Quality Guidelines
WSER	Wastewater Systems Effluent Regulations
WWTP	Wastewater Treatment Plant
µg/L	Micrograms/litre

CORE AREA WASTEWATER FACILITIES
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1.0 BACKGROUND

The Capital Regional District (CRD) treats Core Area wastewater at the McLoughlin Point Wastewater Treatment Plant (MPWWTP; Figure 1.1). This facility was commissioned in August 2020 to replace the previous practice of discharging fine-screened (6 mm) wastewater through the Macaulay Point (Macaulay) and Clover Point (Clover) outfalls. The MPWWTP receives wastewater for the Core Area catchment serving a population of 327,474 (CRD 2024 estimate). Wastewater is treated to a tertiary standard before being discharged through a 1,925 metre (m) long outfall to the Salish Sea (Juan de Fuca Strait). This outfall includes a 210 m long multiport diffuser that terminates at a depth of 60 m approximately 200 m east of the existing Macaulay Point outfall terminus.

CRD Core Area Liquid Waste Management Plan and Sewage Treatment Upgrades

In March 2003, the CRD Core Area Liquid Waste Management Plan (LWMP) (CRD, 2000) was approved by the BC Ministry of Environment and Parks (ENV). The plan outlined the CRD's strategy to manage liquid wastes for the next 25 years. Commitments made in this plan were designed to protect public health and the environment from the impacts of liquid waste discharges. On July 21, 2006, the CRD received a letter from the Province requiring an amendment to the plan. The amendment detailed a schedule for the provision of secondary or better sewage treatment and requested that the CRD continue the current monitoring program. Plan amendment #7 (CRD, 2009) was submitted to ENV in December 2009, along with follow-up amendments #8 (CRD, 2010), #9 (CRD, 2014), #10 (CRD, 2016a), #11 (CRD, 2016b), #12 (CRD, 2017), and #13 (CRD, 2025). Amendments 1-12 have all been conditionally approved by ENV and included the CRD's commitment to build the new wastewater treatment plant at McLoughlin Point, and a facility at Hartland Landfill to treat the resulting sewage residuals to a Class A biosolids standard, as per the BC Organic Matter Recycling Regulation. Amendment #12, detailing the District of Oak Bay's plans to eliminate the two combined sewer overflow (CSO) locations in the Clover system, was also conditionally approved in June 2018. Amendment #13 details infiltration and inflow reduction commitments and is still under review by the province.

The McLoughlin WWTP operates under *BC Municipal Wastewater Regulation* registration RE-108831, which was originally issued in June 2020 and revised in February 2021. The MPWWTP also meets all requirements of the Federal *Wastewater Systems Effluent Regulation* (WSER). The Macaulay and Clover outfalls historically operated under permits issued by ENV under the 2004 *BC Environmental Management Act* [formerly the *BC Waste Management Act* (BCMoE, 2004)]. Following the commissioning of the McLoughlin facility, the permit for Clover was cancelled effective June 20, 2021, and for Macaulay effective January 7, 2022. The transitional authorizations for Macaulay and Clover, to discharge deleterious substances under WSER, were cancelled as of December 31, 2020. Operation of all three outfalls is detailed in long-term direction of the LWMP (Appendix A1).

Sewage Treatment at McLoughlin Point Wastewater Treatment Plant

Screening and grit removal occurs at the Macaulay and Clover pump stations (Figure 1.1) prior to pumping flows to McLoughlin Point Wastewater Treatment Plant. The MPWWTP can handle up to 432 megalitres per day (MLD), which is four times the Average Dry Weather Flow (ADWF = 108 MLD per day). Treatment processes include:

- Primary Treatment:
  - Lamella plate settlers for flows up to 216 MLD (i.e., 2xADWF).
  - High rate Densadegs for flows exceeding 216 MLD and up to 432 MLD (i.e., 2-4xADWF).

- Secondary Treatment: a sequence of Moving Bed Biofilm Reactors (MBBR) and Biological Aerated Filters (BAF) for primary flows up to 216 MLD.

- Tertiary Treatment: Cloth Disk Filters for secondary flows up to 216 MLD.

Future Capacity and Demand Management

Water conservation is important to supporting the long-term efficiency and reliability of wastewater treatment operations. Through reduced water demand and peak usage, water conservation and demand management can reduce strain on wastewater treatment plant processes.

The CRD has an established regional water conservation program that includes targeted outreach and education for the residential and industrial, commercial, institutional (ICI) sectors. The region has an annual service population growth rate of approximately 1.6%. In 2025, the regional per capita demand was 332 litres per capita per day, which aligns with the three-year average per capita demand. Regional per capita demand has shown a steady annual decrease since the inception of the CRD water conservation program in the mid-1990s but has shown a plateauing trend in recent years.

The residential sector accounts for approximately 67% of total demand and the industrial/ commercial/institutional sector accounts for approximately 21% of total demand. The balance of demand is comprised of agricultural demand (3%) and non-revenue (leaks/losses) demand (9%). In 2025, the CRD's Residential Water Conservation Program advanced regional water efficiency through targeted education and outreach initiatives. The Waterwise multi-media campaign increasing public awareness of water use restrictions and promoted sustainable outdoor and indoor water practices. A postcard mailout reached over 100,000 homes, while a new peak demand focused informational video and targeted outreach to the irrigation sector outreach helped further strengthen the campaign. During Fix a Leak Week, residents were supported in identifying and repairing household leaks, reducing unnecessary water loss through the distribution of 145 fix-a-leak-week kits.

The ICI water conservation program focuses on improving water use efficiency through providing economical recommendations. In 2025, the program focused on preparation for the upcoming Once-Through Cooling ban, effective 2028. A prevalence study was conducted, and plans were created to facilitate the remaining rebates, expiring in July 2026. The peak demand campaign for ICI sent a targeted mail-out to 1000 businesses, and conducted direct engagement with all municipalities, school districts, golf courses, Island Health and the Residual Treatment Facility. All of which agreed to make the switch.

High Flow Bypass and Overflows

Flows up to 216 MLD (i.e., 2xADWF) receive full tertiary treatment at MPWWTP. When flows exceed 216 MLD, typically during wet weather, the flows above 216 MLD receive primary treatment only (high rate Densadeg) and are then blended with the tertiary effluent prior to outfall discharge.

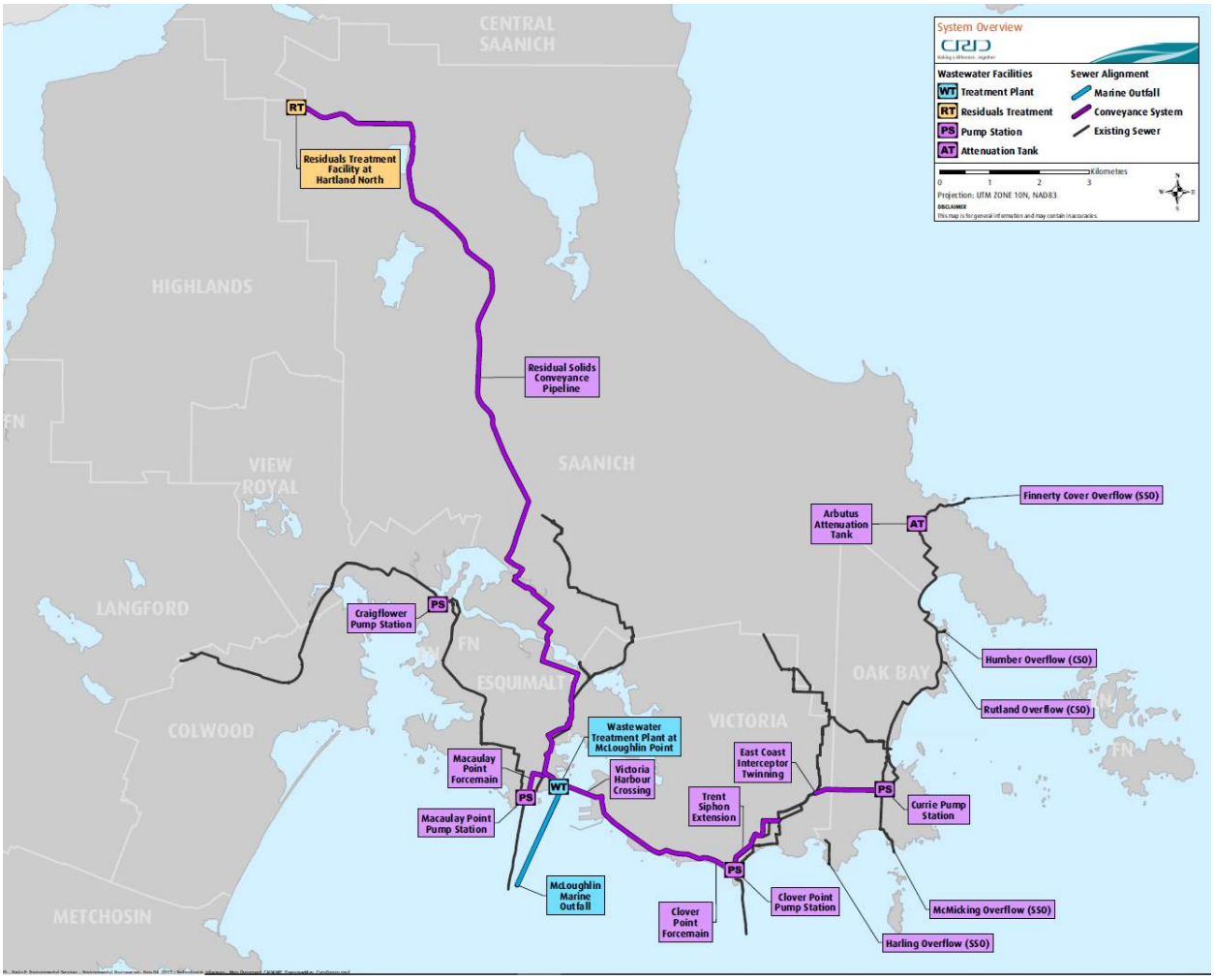
Both Clover and Macaulay pump stations have upgraded capacity to pump 4xADWF to MPWWTP. During heavy rain events, flows may exceed this threshold. In these rain events, flows exceeding 4xADWF are screened to 6 mm and discharged out the Macaulay and/or Clover long outfalls – effectively operating as sanitary sewer overflow points for the upstream conveyance system. These overflows rarely occur since commissioning of the WWTP and concurrent conveyance system upgrades.

Wastewater has been discharged from the Macaulay and Clover Point outfalls for over 100 years. The Macaulay outfall has been in use since 1915, with the initial discharge at low tide level. In 1971, to alleviate shoreline pollution, the discharge location was moved offshore. The outfall is now approximately 1,800 m long and terminates in a multiport diffuser at a depth of 60 m. The discharge of municipal wastewater at Clover began in 1894. Discharge was to the shoreline until 1981, when construction of an extended outfall was completed. The Clover outfall is approximately 1,160 m long and discharges through a multiport diffuser at a depth of approximately 65 m.

The treated McLoughlin and screened wet weather Macaulay and Clover wastewaters are discharged to the deep, cold, and fast-moving waters of Juan de Fuca Strait. The non-saline wastewater is then rapidly diluted as it mixes with surrounding saline receiving water. As the wastewater plume mixes with the saline water, it rapidly rises and traps at mean depths of 20-50 m (McLoughlin) and 45-60 m (Macaulay and

Clover), with some plume surfacing predicted and measured during periods of slack tide, predominantly during the winter months (Hodgins, 2006; Lorax, 2019).

Figure 1.1 Locations of Major Core Area Wastewater Facilities and Discharge Locations



In addition to the three main discharge points, there are several shoreline sanitary sewer overflow (SSO) and two combined sewer overflow (CSO) locations in the upstream conveyance system (Figure 1.1) that serve as wet weather and emergency bypass and overflow locations.

The Arbutus Flow Attenuation Tank was installed in the upstream conveyance system (near Haro Woods) as part of the MPWWTP construction project. The Marigold holding tank was constructed in 2004 to attenuate flows on the west side of the conveyance system. These holding tanks reduce the frequency of SSO discharge events relative to the old configuration.

The two CSO locations (Humber and Rutland pump stations) are within the District of Oak Bay. Oak Bay is required to separate these systems and has recently partially separated the collection system feeding Humber Pump Station. The separation plan for the collection system feeding Rutland pump station is still in planning stages. Until fully separated, the frequency of CSO discharge events will remain unchanged as they are operated independently of the adjacent trunk conveyance system during wet weather events.

1.1 Approach and Program Components

The current monitoring program components were developed in conjunction with BC ENV and the Marine Monitoring Advisory Group (MMAG), as part of the newest environmental monitoring program based on a five-year cycle. Information about the monitoring program for years prior to 2011 can be found in Appendix A. The first cycle (Cycle 1) took place from 2011-2015, but one component (the fish survey) was delayed until 2018 due to logistical challenges. Cycle 2 began in 2016 and ended in 2020. Cycle 3 began in 2021 and ended in 2025. The objectives of the monitoring program [as presented in the Core Area Liquid Waste Management Plan (CRD, 2000) and updated in amendment #7 (CRD, 2009)] are as follows:

- Monitor and assess wastewater quality and quantity.
- Monitor and assess the potential effects of the wastewater discharges to the marine environment.
- Monitor and assess the potential effects of the wastewater discharges to human health.
- Provide information to the CRD's Regional Source Control Program.
- Provide information to wastewater treatment managers regarding plant and outfall diffuser performance.
- Submit compliance monitoring results to regulatory agencies.
- Report to the public regarding the use of the marine environment for the disposal of municipal wastewater.

A summary of the monitoring components and sampling frequency of the current five-year EMP Cycle 3 is presented in Table 1.1. The 2025 monitoring program is presented in Table 1.2 and consists of the following components:

- Wastewater monitoring and analysis for a list of substances, including conventional parameters, metals, other compounds of concern and toxicity (conducted monthly at McLoughlin).
- Initial dilution zone and receiving environment monitoring including surface water and water column analysis for bacteriological indicators of potential for human exposure to wastewater in the marine environment. Additionally, a list of substances, including conventional parameters, metals, and other priority substances (conducted quarterly at McLoughlin, and only if they are discharging coincident with routine McLoughlin sampling, around the Macaulay and Clover outfalls).
- Wet weather overflow and bypass sampling for bacteriological indicators of potential for human exposure to wastewater in the marine environment, and a subset of conventional parameters indicative of wastewater strength (conducted as needed at Macaulay and Clover, and around the various shoreline overflow locations when bypass, overflow or wet weather events occurred).
- Sediment chemistry, sediment toxicity, and mussel tissue chemistry (Clover Point).
- Crab and finfish survey for biological indicators, tissue bioaccumulation, and risk assessment (McLoughlin, Macaulay and Clover Point)
- Continuing additional investigations that address specific questions about water column and seafloor monitoring components and that investigate emerging scientific issues regarding wastewater discharges and environmental effects.

Reclaimed water monitoring is also a requirement of the EMP, but the reclaimed water system was abandoned early in 2021 due to operational challenges. As a result, no reclaimed water data will be presented in this report.

Multiple lines of evidence are considered to assess potential environmental effects of wastewater effluent discharged from McLoughlin. Wastewater is analysed on a regular basis for chemical and physical parameters present in sanitary sewage and these results are compared to compliance limits and regulatory guidelines. The potential effects of these substances on organisms in surface waters and the water column are assessed through both acute and chronic toxicity test results. Substance concentrations are also compared against predicted marine receiving environment concentrations and water quality guidelines. The predicted concentrations are calculated by applying computer model-derived receiving environment dilution

factors to the wastewater concentrations. Predicted concentrations are then confirmed by surface and water column monitoring around each outfall. Human health risks are assessed through surface water, water column, and shoreline bacteriological monitoring.

Concentrations of substances present in the wastewater discharges are also analysed in sediments around the outfalls and at reference sites. Sediment chemistry results are compared to various sediment quality guidelines as a screening tool to predict potential effects on biological organisms in the marine environment. Finally, organisms that live proximal to the outfalls are monitored to assess effects of the discharges through body condition, tissue chemistry, and biochemical endpoints.

The marine organisms that have the greatest potential for measurable effects are those that are sessile, or have a limited range, and are therefore exposed to the wastewater discharges for most or all their life stages. These organisms include benthic invertebrate communities near the McLoughlin and Macaulay outfalls and mussel communities off the Clover outfall. Prior to 2011, these organisms were monitored annually. As part of the revised EMP design, the monitoring frequency was reduced to only once (mussel communities) or twice (benthic invertebrate communities) in the five-year cycle. This reduced frequency has allowed for the addition of sediment toxicity and bioaccumulation assessments, along with a finfish and crab health study.

In addition to the sediment toxicity and bioaccumulation studies, the health of the seafloor communities is evaluated by assessing organism presence, abundance, growth and reproductive status. These biological indicators provide a direct assessment of *in situ* environmental effects. Potential effects to higher trophic levels (e.g., fish and marine mammals) are also assessed by measuring concentrations of substances present in wastewater, sediments, benthic invertebrates, mussel, finfish and crab tissue.

The five-year monitoring cycles will continue to be supplemented by additional investigations according to priorities presented in this report and in response to emergent environmental concerns. Additional investigations are important elements of the monitoring program, with some of the investigations part of the requirements under the Core Area LWMP 2003 approval. Current additional investigations are presented and discussed in Section 6.0. Results from these investigations are incorporated in the overall assessment of effects on the marine environment.

Monitoring year 2025 represents Cycle 3, Year 5 of the Environmental Monitoring Program (EMP; formerly the Wastewater and Marine Environment Program [WMEP]). As the Residuals Treatment Facility at Hartland Landfill is regulated under a separate provincial authorization (ME-109471), biosolids monitoring results are presented in separate reports (CRD, 2026a and HRMG, 2025).

This report is a companion report to a wastewater operations-focused report that was submitted to the province in May 2026 (CRD, 2026b). The wastewater operations report summarized the 2025 operator staff, upgrades and capital projects, future capacity and demand management, non-compliance events, weather events, process performance, chemical, electrical, and natural gas usage, and odour complaints.

1.2 Data Presentation and Analysis

Summary data reports are now prepared following each five-year cycle, beginning with the 2011 monitoring year. These data reports will include any completed statistical assessments of the data, and the results used to confirm the suitability of the upcoming year's monitoring design. Additional guidance on the interpretation and analysis of this data beyond what is contained in this report is available upon request (Appendix A2; Golder, 2011). A comprehensive interpretive report will be prepared at the end of each five-year cycle (after year five) and will include detailed statistical and environmental risk assessments of all data collected during the five-year cycle. The comprehensive report for Cycle 1 was expanded to include 2016-2019 Cycle 2 data. The final report was received in the fall of 2020 (Hatfield, 2021) and a summary of the findings was presented in CRD, 2021.

This report presents a summary of the results of the 2025 Core Area EMP (Cycle 3, Year 5), along with any data and analyses of results from previous years that have not yet been presented. Limited statistical analyses have been performed on the 2025 data; a more detailed and comprehensive statistical

assessment of the results will be undertaken as part of the upcoming Cycle 3 (2021-2025) review that will be initiated in late 2026.

Table 1.1 Monitoring Components of the Five-Year McLoughlin, Macaulay and Clover Environmental Monitoring Program (Cycle 3)

Monitoring Component	Sub-component	Year 1 (2021)			Year 2 (2022)			Year 3 (2023)			Year 4 (2024)			Year 5 (2025)		
		McL[1]	Mac[1]	Clo[1]	McL	Mac	Clo	McL	Mac	Clo	McL	Mac	Clo	McL	Mac	Clo
WASTEWATER																
Wastewater	daily, weekly, monthly and quarterly chemistry	√			√			√			√			√		
	quarterly high-resolution chemistry	√			√			√			√			√		
	monthly toxicity testing	√			√			√			√			√		
	ad hoc wet weather, overflow and bypass chemistry		√	√		√	√		√	√		√	√		√	√
SEAFLOOR																
Sediment	sediment chemistry				√	√	√				√	√				√
	pore-water chemistry				√	√	√				√	√				
	sediment toxicity				√	√	√				√	√				√
	sediment/benthic invertebrate bioaccumulation				√	√					√	√				
Benthic Invertebrates	community structure				√	√					√	√				
Mussels	community indices and health															√
	tissue chemistry															√
Fish	health indices														√	√
	whole fish and fillet tissue chemistry														√	√
SURFACE WATER AND WATER COLUMN																
Surface Water	bacteria	√			√			√			√			√		
Water Column	bacteria, conventionals, metals	√			√			√			√			√		
Ad Hoc Wet Weather, Overflow and Bypass Events	surface and water column bacteria		√	√		√	√		√	√		√	√		√	√
	shoreline bacteria	various conveyance system sanitary and combined sewer overflow shoreline locations														
REPORTING AND ADDITIONAL INVESTIGATIONS																
Additional Investigations	dependent upon emerging environmental issues and recommendations	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Reporting	annual data summary report	√	√	√	√	√	√	√	√	√	√	√	√			
	five-year comprehensive report													√	√	√

Notes:
[1] McL-McLoughlin, Mac-Macaulay, Clo-Clover.

Table 1.2 Monitoring Components of the 2025 McLoughlin, Macaulay and Clover Environmental Monitoring Program

McLoughlin Outfall	Parameter	Monitoring Frequency
Wastewater	Flow	Daily
	Compliance monitoring	Federal – Weekly, Provincial – Various frequencies
	Conventional parameters[1] and priority substances[1]	Monthly
	Enhanced priority substances[1]	Quarterly (January, May, August, December)
	Toxicity – acute	Monthly
	Toxicity – chronic	Annually
Surface Water & Water Column	Indicator bacteria (fecal coliform and enterococci) and CTD (dissolved oxygen, salinity, temperature) Conventional parameters[1] and metals[1]	Quarterly with 5 sampling events in 30 days during each quarter
Macaulay Outfall	**Parameter**	**Monitoring Frequency**
Wastewater	Flow	Measured during bypasses and overflows
	Indicator bacteria and select conventional parameters	Measured during bypasses and overflows
Surface Water & Water Column	Indicator bacteria (fecal coliform and enterococci) and CTD (dissolved oxygen, salinity, temperature) Conventional parameters[1] and metals[1]	Measured during bypasses and overflows if coincident with routine McLoughlin surface water sampling
Clover Outfall	**Parameter**	**Monitoring Frequency**
Wastewater	Flow	Measured during bypasses and overflows
	Indicator bacteria and select conventional parameters	Measured during bypasses and overflows
Surface Water & Water Column	Indicator bacteria (fecal coliform and enterococci) and CTD (dissolved oxygen, salinity, temperature) Conventional parameters[1] and metals[1]	Measured during bypasses and overflows if coincident with routine McLoughlin surface water sampling
Seafloor Mussels and Sediment	Conventional parameters[1] and priority and high resolution substances[1]	One time in a five-year cycle (2025) at Clover
Crab and Finfish Survey	Condition, tissue chemistry, biochemical assays	One time in a five-year cycle (2025) at Clover and Macaulay
Conveyance Overflows	**Parameter**	**Monitoring Frequency**
Shoreline	Indicator bacteria (fecal coliform and enterococci)	Measured during bypasses and overflows

Notes:
[1]Analyte lists can be found in Appendices B1 (wastewater), and C1 (water column).
CTD: Conductivity, temperature and density

2.0 WASTEWATER MONITORING

2.1 Introduction

Influent and final effluent monitoring is conducted regularly to assess compliance with the registration requirements under the Municipal Wastewater Regulation and the Federal regulation (WSER). Regulated parameters include carbonaceous biochemical oxygen demand (CBOD), un-ionized ammonia, toxicity, total suspended solids (TSS), and pH. Table 2.2 presents the federal and provincial limits for these regulated parameters.

Monitoring is also conducted to profile the chemical and physical constituents of influent and effluent before they are released to the marine receiving environment. Assessment of influent and effluent provides information on the concentrations and loadings of contaminants released to the marine receiving environment and provides an indication of which substances may be of environmental concern. These results are then used to direct the efforts of the receiving environment monitoring program and the CRD's Regional Source Control Program.

Wastewater monitoring is also required at the Clover and Macaulay pump stations during conveyance system wet weather overflows or planned and approved maintenance bypass events. The objective of this monitoring is to assess equivalency to primary treatment and provide data to determine potential risk to the receiving environment. If these events happen concurrently with routine MPWWTP surface water sampling, then receiving environment sampling around the Macaulay and Clover outfalls is also required (discussed in Section 3.0).

The MPWWTP provincial registration allows the use of reclaimed water for operations use (i.e., wash down treatment works). The registration designates the use as "moderate exposure-frequent use", which stipulates criteria for reclaimed water quality to protect the environment and human health. The use of reclaimed water was discontinued in 2021 due to challenges meeting effluent quality compliance with the registration. This challenge was due to frequency of use: the reclaimed system was designed to operate more frequently than it was, resulting in fouling and non-compliance. The reclaimed water system was subsequently shut down.

2.2 Methods

Federal and Provincial Compliance Sampling

As required by the applicable regulations and registration, federal and provincial MPWWTP final effluent compliance monitoring was conducted using 24-hour flow-based composite samples. Flow-based sampling is carried out using subsamples collected proportional to the flow (recorded by the supervisory control and data acquisition system (SCADA). After collection, samples were immediately dispatched to two Canadian Association of Laboratory for Accreditation Inc. (CALA) certified laboratories to conduct chemical analyses (Bureau Veritas Laboratories [BV Labs, Burnaby, BC] and the in-house MPWWTP Laboratory).

Toxicity testing using rainbow trout and *Daphnia magna* was conducted monthly by Nautilus Environmental (Burnaby, BC & Calgary, AB) using final effluent grab samples. The rainbow trout test methods approved by regulators (provincial and federal) include both EPS 1/RM/50 and EPS 1/RM/13. Test method EPS 1/RM/13 does not use CO_2 aeration to adjust for pH drift while EPS 1/RM/50 does. To use test method EPS 1/RM/50, the operator must demonstrate that any toxicity is caused by ammonia and pH drift in the test conditions. Final effluent was tested initially in 2021 using 1/RM/13 but was switched to pH stabilized 1/RM/50 after ammonia toxicity was demonstrated (discussed further in Section 2.3.4). Starting in 2024, the rainbow trout tests were transitioned to the single concentration method under EPS 1/RM/50.

Influent and effluent flow volumes were measured continuously (every few minutes) by a SCADA system at the MPWWTP influent and effluent points. Final effluent flow measurements were compared to maximum daily and annual mean flow limits specified in the permits. Flow values were also used for the calculation

of loadings of conventional and priority substances by multiplying daily flows against daily concentrations then extrapolating out to annual loadings to the marine receiving environment.

Wastewater Characterization

CRD staff conducted influent and effluent sampling at the MPWWTP to characterize wastewater and assess treatment plant performance. Samples were analysed daily, weekly, monthly, and/or quarterly for over 20 conventional parameters, including total suspended solids and nutrients. Approximately 500 substances were analysed monthly or quarterly as listed in Table 2.1 and Appendix B1. Acute toxicity tests were carried out monthly and chronic toxicity tests were carried out annually.

In 2025, MPWWTP influent and effluent samples were taken as 24-hour time-based composites (400 mL wastewater collected every 30 minutes for 24 hours and combined into one sample). Time-based composites, rather than flow-based composites, were used for wastewater characterisation to ensure the results were comparable to historical methods and that adequate sample volumes were collected. Due to operational requirements, influent sampling was temporarily conducted at Clover and Macaulay pumpstations for the months of April, May, and June. Samples were successfully collected at both pumpstations in May and June; however, due to equipment failure, samples were collected solely at Macaulay for the month of April. During the months of May and June, influent concentrations and loadings were calculated based on daily discharge flows at each pumpstation. During the month of April, the influent concentrations and loadings were calculated based on Macaulay pumpstation results.

The list of priority substances was originally adapted from the US Environmental Protection Agency (US EPA) National Recommended Water Quality Criteria; Priority Toxic Pollutants list (US EPA, 2002). The CRD's list is reviewed and updated periodically in response to new information on analytical techniques, emerging contaminants of concern, and potential effects to the receiving environment. The list was most recently revised to align with Ocean Wise's Pollution Tracker Program.

Samples were delivered to CALA certified laboratories for chemical analyses. Conventional and priority substance parameters were analysed by Bureau Veritas Laboratories (BV Labs, Burnaby, BC) and the CRD Water Quality Laboratory. High-resolution analyses were conducted at SGS AXYS Analytical Services (Sidney, BC). Substances were analysed using methods suitable for comparison to applicable water quality guidelines. Acute (Appendix B7) and chronic (Appendix B8) wastewater toxicity testing was conducted by Nautilus Environmental (Burnaby, BC & Calgary, AB), using standardized and Environment and Climate Change Canada (ECCC) protocols.

Overflow and Bypass Sampling

As required by ENV, any overflow or bypass discharge event from either the Clover or Macaulay pump station must be sampled by automated composite samplers. These samplers are programmed to collect composite samples in 400 mL aliquots every 30 minutes if an overflow or bypass event results in discharge exceeding one hour. After collection, composite samples are then delivered to CALA certified laboratories for fecal coliform, enterococci, TSS, and CBOD analyses.

Table 2.1 Frequency of Wastewater Sampling by Analytical Group

(Appendix B1 provides a listing of individual analytes within each analytical group)

Parameter Group	Influent and Final Effluent Analytics			
	Daily/ Weekly	Monthly	Quarterly	Annual
Conventionals (nutrients, oxygen demand, pH, TSS)	√	√	√	
Metals, total		√	√	
Metals, speciated (MeHg and tributyltin (TBT)			√	
Metals, dissolved		√	√	
Aldehydes		√	√	
Phenolic compounds		√	√	
Chlorinated phenolics		√	√	
Non-chlorinated phenolics		√	√	
Polycyclic aromatic hydrocarbons		√	√	
Semi-volatile organics		√	√	
Miscellaneous semi-volatile organics		√	√	
Volatile organics		√	√	
Terpenes		√	√	
Acute Toxicity				
Rainbow trout 96-hr LC50 pH stabilized or % survival at 100% effluent		√*		
Daphnia magna 48-hr LC50		√*		
Chronic Toxicity				
Ceriodaphnia dubia 7-day (survival and reproduction)				√*
Rainbow trout alevin and embryo (EA) 30-day (survival and growth)				√**
Pacific topsmelt 7-day (survival and growth)				√*
Echinoderm fertilization (reproduction)				√*
High-Resolution Analyses				
Nonylphenols (NP)			√	
Organochlorine pesticides (OC Pest)			√	
Pharmaceuticals and personal care products (PPCP)			√	
Polychlorinated biphenyls (PCB)			√	
Polycyclic aromatic hydrocarbons (PAH)			√	
Polybrominated diphenyl ethers (PBDE)			√	
Polychlorinated dibenzodioxins (PCDD)			√	
Per- and poly-fluoroalkyl substances (PFAS)			√	

Notes: *final effluent only; **endpoint was not completed due to organism supply challenges.

DATA QUALITY ASSESSMENT

CRD staff followed rigorous quality assurance/quality control (QA/QC) assessment procedures for both field sampling procedures and laboratory analyses for the routine wastewater monitoring component (Golder, 2017). From each analytical batch (12 monthly batches in 2025), one sample was run as a laboratory triplicate analysis annually and one sample was randomly chosen for field triplicate analysis. In addition, one sample each month was analysed as a matrix spike. Trip and field blanks were tested once in 2025. The analytical laboratories also conducted internal QA/QC analyses, including method analyte spikes, method blanks and standard reference materials.

Any data that exhibited failures of QA/QC criteria were not included in any statistical analysis.

2.3 Results and Discussion

Federal and Provincial final effluent compliance limits are provided in Table 2.2.

Table 2.2 McLoughlin Point WWTP Provincial and Federal Compliance Limits – Final Effluent

Parameter	Unit	Provincial Limit		Federal Limit
		McLoughlin WWTP ≤216,000 m^3/day	McLoughlin WWTP* >216,000 m^3/day	McLoughlin WWTP ≤432,000 m^3/day
CBOD	mg/L	25 (maximum) 10 (monthly average)	130 (maximum)	25 (monthly average)
Rainbow Trout Toxicity	Pass/ fail	pass	---	pass
TSS	mg/L	25 (maximum) 10 (monthly average)	130 (maximum)	25 (monthly average)
Unionized NH_3 @ 15°C	mg/L	---	---	1.25 (maximum)
pH	pH	6-9	---	---
Effluent Flow (maximum)	m^3/day	432,000		---

Notes:
*Provincial registration allows only 70 days per year >216,000 m^3/day.

2.3.1 Provincial Compliance Monitoring

Effluent monitoring is undertaken to ensure compliance with the provincial registration issued for MPWWTP; effluent quality limits vary depending on whether the facility is discharging solely tertiary effluent when flows are less than or equal to 216,000 m^3/day (≤2ADWF), or blended (primary + tertiary) effluent when flows are greater than 216,000 m^3/day (>2DWF). Table 2.2 presents these compliance limits. The MPWWTP is authorized to blend primary and tertiary flows for 70 days per year.

The average daily effluent flow from MPWWTP was 94,395 m^3/day and the maximum was 297,780 m^3/day on December 10, 2025, well below the limit of 432,000 m^3/day. Daily discharge flows are presented in Figure 2.1 and tabulated in Appendix B3. Daily influent flow is tabulated in Appendix B2.

Appendix B4 presents the compliance results for non-blended flow days (<216,000 m^3/day). MPWWTP effluent was not compliant with provincial registration requirements on the following occasions:

Monthly Averages

- The monthly average TSS concentration was out of compliance for 5 of 12 months (February, March, April, May, and June).
- The monthly average CBOD concentration was out of compliance for 10 of 12 months (January, February, March, April, May, June, July, September, October, and December).

Maximum Values

- The maximum TSS concentration was compliant throughout 2025.
- The maximum CBOD concentration was out of compliance six times in 2025 (February 8, March 9, April 15, April 16, April 23, and May 15).

The MPWWTP was designed to produce final effluent meeting 10 mg/L TSS and 10 mg/L CBOD; however, this design standard was not anticipated to be informative of the permit limits considering the plant discharges to the marine environment. Possible changes to these limits are being discussed with the regulator. In the meantime, source control, pre-treatment and flow control measures in partnership with large private sector and CRD inputs such as the Hartland Residuals Treatment Facility and Hartland Landfill leachate effluent are being implemented to improve facility performance.

Effluent blending should not occur at daily flow levels below 216,000 m^3/day. However, plant bypasses can occur when instantaneous flows exceed 216,000 m^3/day, even if total daily flow does not exceed that threshold. In 2025, there were 43 days when blended effluent discharge occurred. The discharge flow was in excess of the 216,000 m^3 discharge limit on March 24, 2025 (235,015 m^3), December 10, 2025 (297,780 m^3), December 11, 2025 (225,160 m^3), December 16, 2025 (224,730 m^3), and December 17, 2025 (288,470 m^3). All 43 blended discharge dates are out of compliance because full tertiary treatment capacity was not achieved prior to blending. Operators continue to refine the instantaneous flow control set points that resulted in the premature blending.

Total daily flow should not exceed 432,000 m^3/day; this limit was not exceeded in 2025.

Table 2.3 presents flow measurements and compliance results for the 43 days that blended discharges occurred; however, this includes 20 days of authorized secondary and tertiary treatment bypass between March 26 through April 14. Results for blended discharge days met the provincial discharge limit of 130 mg/L TSS on all dates; however, the provincial discharge limit of 130 mg/L CBOD was exceeded on five dates (maximum 156 mg/L). All CBOD exceedances occurred during the authorized bypass period.

Toxicity Testing

Acute toxicity tests conducted with rainbow trout and *Daphnia magna* met all applicable test endpoints for each 2025 sampling event. Acute toxicity testing was carried out by Nautilus Environmental (Calgary, AB).

2.3.2 Federal Compliance Monitoring

Appendix B4 presents results of compliance to WSER. The MPWWTP was compliant with WSER limits for TSS, unionized ammonia, and CBOD in 2025.

Figure 2.1 McLoughlin Point WWTP Discharge Flows in 2025

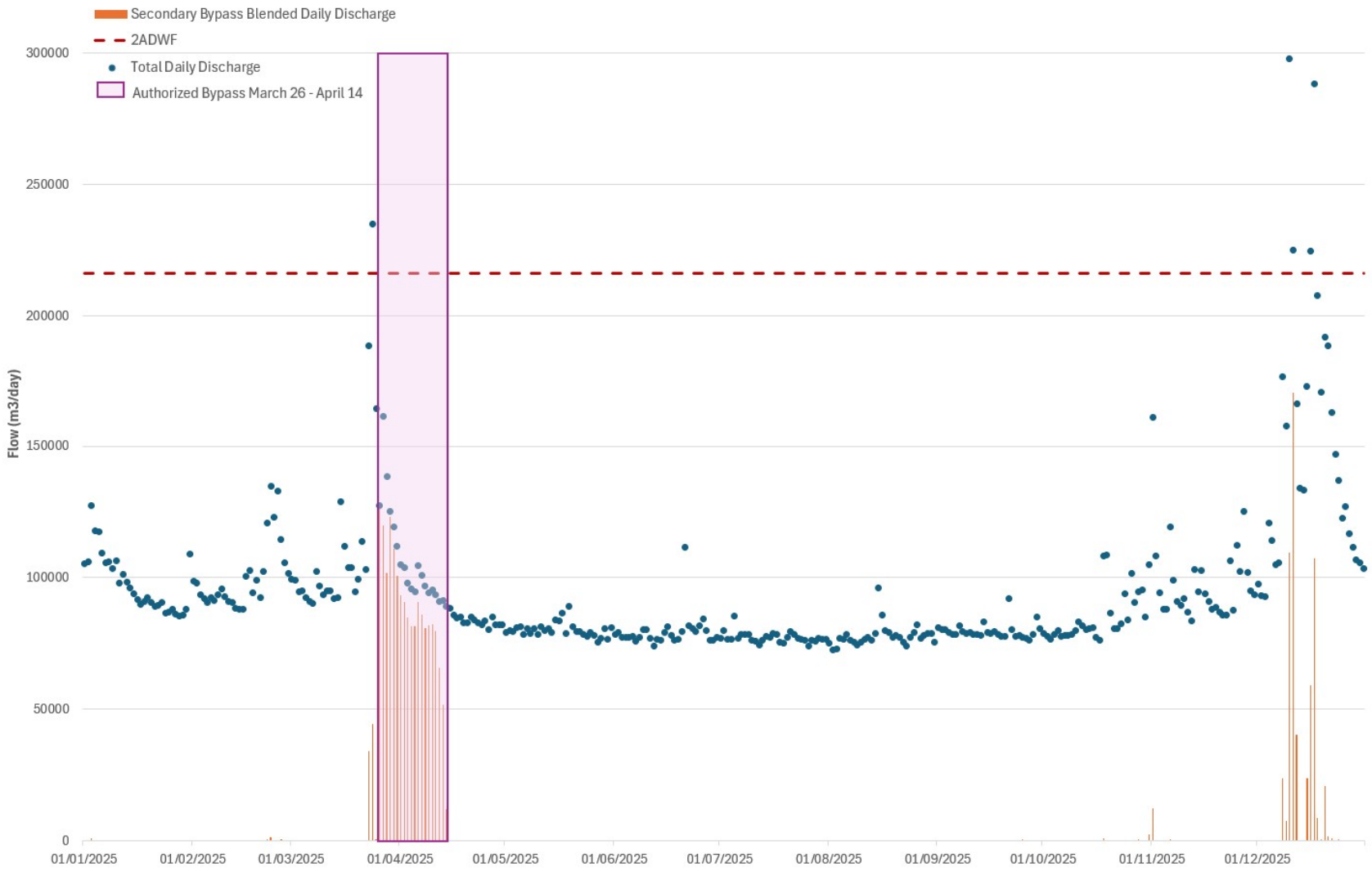


Table 2.3 McLoughlin Point WWTP Provincial Wastewater Compliance Results for Blended Discharge Days in 2025

McLoughlin Point Wastewater Treatment Plant Final Effluent					
	Blended Days*	Flow (total)	Flow (blended portion of total)	CBOD	TSS
	(cumulative to date)	m^3/day	m^3/day	mg/L	mg/L
Provincial Limit Registration	**70**	**432,000****		**130 (maximum)**	**130 (maximum)**
03/01/2025	1	127,520	988	---	---
22/02/2025	2	120,927	172	---	---
23/02/2025	3	134,741	1,199	12.5	15.2
26/02/2025	4	114,614	194	14.9	12.0
23/03/2025	5	188,606	33,982	14.7	38.7
24/03/2025	6	235,015	44,497	14.9	27.2
26/03/2025*	7	127,430	127,430	47.0	60.0
27/03/2025*	8	161,551	119,790	45.5	28.0
28/03/2025*	9	138,501	101,981	---	---
29/03/2025*	10	125,014	123,311	---	---
30/03/2025*	11	119,269	110,832	77.5	69.0
31/03/2025*	12	112,005	100,823	113.0	92.0
01/04/2025*	13	104,998	93,438	**133.0**	94.0
02/04/2025*	14	103,756	90,928	117.0	79.0
03/04/2025*	15	97,822	85,011	**148.0**	90.0
04/04/2025*	16	95,745	81,399	---	---
05/04/2025*	17	94,526	81,597	---	---
06/04/2025*	18	104,539	90,883	110.0	90.0
07/04/2025*	19	100,755	85,867	127.0	97.0
08/04/2025*	20	96,672	80,916	**156.0**	69.0
09/04/2025*	21	94,097	81,869	---	---
10/04/2025*	22	95,339	82,249	**142.0**	78.0
11/04/2025*	23	93,402	79,712	---	---
12/04/2025*	24	90,988	65,846	**140.0**	102.0
13/04/2025*	25	91,225	51,650	112.0	78.0
14/04/2025*	26	89,227	11,935	57.1	50.0
18/10/2025	27	108,360	799	---	---
28/10/2025	28	94,700	600	17.4	14.0
31/10/2025	29	104,800	2,200	---	---
08/12/2025	30	176,650	23,800	18.8	23.2
09/12/2025	31	158,140	7,430	8.6	9.2
10/12/2025	32	297,780	109,560	12.2	25.4
11/12/2025	33	225,160	170,820	31.7	34.7
12/12/2025	34	166,460	40,260	20.0	27.2
15/12/2025	35	173,210	23,800	11.1	15.5
16/12/2025	36	224,730	58,900	12.8	18.6
17/12/2025	37	288,470	107,360	9.5	12.2
18/12/2025	38	207,660	8,740	10.5	14.8
19/12/2025	39	170,760	160	---	---
20/12/2025	40	191,730	20,640	---	---
21/12/2025	41	188,450	1,470	9.6	14.0
22/12/2025	42	163,240	770	9.5	8.0
24/12/2025	43	137,120	10	---	3.0

Notes:
DD/MM/YYY* - authorized secondary and tertiary treatment bypass from March 26 through April 14, 2025
*Blending occurs when instantaneous flows exceed 216,000 m^3/day (equivalent to 2xADWF – two times average dry weather flow).
**Maximum daily flow not to exceed 432,000 m^3/day
--- no sample
Grey shading indicates non-compliant blending occurred.
Red shading indicates exceedance to provincial limit.

2.3.3 Priority Substances

As part of the 2025 monitoring program, McLoughlin Point WWTP final effluent was analysed for priority substances, as listed in Table 2.1 and Appendix B1, to comprehensively assess effluent quality. In 2025, 561 parameters (detection rate = 66%) were analysed as total concentration, and 44 parameters (detection rate = 97%) were analysed for their dissolved fraction. The frequencies of detection of all substances analysed in wastewater are included in Appendix B6.

Compared with the combined historical loadings from the Clover and Macaulay outfalls (CRD, 2020-2022), McLoughlin Point WWTP effluent demonstrated substantially lower loadings, highlighting the treatment performance and removal efficiency achieved through tertiary treatment. Concentrations of substances that were frequently detected (50% or greater) in final effluent are presented in Table 2.4. Annual effluent loadings to the marine environment and influent loadings and removal percentages are presented in Appendix B5.

The potential for wastewater discharges to adversely affect the receiving environment was evaluated by comparing average and maximum concentrations of frequently detected substances (Table 2.4) against BC Approved and Working Water Quality Guidelines (ENV, 2025; ENV, 2025a) and CCME Environmental Quality Guidelines (CCME, 2025) for the protection of marine aquatic life. Conservative estimates of the minimum initial dilution of the wastewaters in receiving waters off the outfalls (113:1 for McLoughlin; Lorax, 2019) were applied to maximum wastewater substance concentrations to predict maximum potential concentrations in the marine environment. These minimum initial dilution factors are predicted to occur at the edge of the initial dilution zone (IDZ; 100 m radius). The use of estimated minimum initial dilution factors allows for a conservative (i.e., highly protective) estimate of potential effects, because the predicted average (mean) initial dilution factors are much higher in the marine receiving environments around the outfall (711:1 [median] for MPWWTP).

Measured final effluent concentrations, before application of minimum initial dilution factors, show several substances exceeding applicable guidelines, including enterococci, fecal coliforms, ammonia, nitrate, benzo(a)pyrene, copper, magnesium, and zinc (Table 2.4). Parameter concentrations and exceedances are similar to previous years. WAD cyanide concentrations have decreased compared to 2024. When the minimum dilution factor was applied, only enterococci and fecal coliforms exceeded guidelines. These results indicate that there is a low risk of guideline exceedance outside of the IDZ; therefore, impacts to aquatic life are unlikely beyond the IDZ.

In final effluent, the bacterial indicator enterococci (Appendix B4) routinely exceeded water quality guidelines (WQG) protective of the public engaging in recreational activities such as swimming and shellfish collection (Health Canada, 2024). The enterococci average concentration was 70,921 CFU/100 mL. The enterococci modelled dilution ratio of 113:1 (Lorax, 2019) indicates environmental concentrations of 628 CFU/100 mL (Table 2.4). The MPWWTP does not use disinfection as part of tertiary treatment and as a result, bacterial indicators are expected to continue to exceed water quality criteria.

Contaminant removal efficiencies are presented in Appendix B6. These values are based on 12 paired influent and effluent samples collected monthly, with loadings calculated from measured concentrations and daily flow rates. Of the hundreds of parameters measured, 32% were undetectable after treatment including pharmaceuticals, hormones, dioxins, PCBs, pesticides and oil and grease. Twelve percent of parameters had a >90% removal efficiency and 20% had a removal efficiency >80%.

Table 2.4 Concentrations of Frequently Detected Substances (50% or more) in McLoughlin Point WWTP Final Effluent – 2025

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Enterococci	TOT	12	CFU/100 mL	0.10	100%	70921	19000	480833	628	70/35	
Fecal Coliforms	TOT	12	CFU/100 mL	0.10	100%	521502	135000	3002800	4615	--- / 200	43 / 14
Alkalinity	TOT	12	mg/L	0	100%	191.52	161.20	247.8	1.695		
Alkalinity - Bicarbonate	TOT	11	mg/L	1.0	100%	236.36	180.00	330	2.092		
Alkalinity - Total - Ph 4.5	TOT	11	mg/L	1.0	100%	192.73	140.00	270	1.706		
BOD	TOT	12	mg/L	0	100%	28.11	17.81	93.95	0.249		
CBOD	TOT	12	mg/L	0	100%	17.58	9.55	68.71	0.156		
Chloride	DIS	12	mg/L	1.0	100%	74.58	61.00	100	0.660		
COD	TOT	12	mg/L	0	100%	104.81	84.77	235.10	0.928		
H2S	TOT	7	mg/L	0.019	86%	0.053	0.019	0.10	0.00047		
Hardness (as CaCO3)	DIS	12	mg/L	0.5	100%	79.16	64.50	105	0.701		
Hardness (as CaCO3)	TOT	12	mg/L	0.5	100%	79.33	63.20	109	0.702		
N - Nh3 (As N)	TOT	12	mg/L	0	100%	34.30	23.38	40.49	0.304	6.7 / 1.0	
N - Nh3 (As N)- Unionized	TOT	12	mg/L as N	0	100%	0.55	0.17	0.8958	0.0049		
N - No2 (As N)	DIS	12	mg/L	0.005	100%	0.97	0.10	3.33	0.0086		
N - No3 (As N)	DIS	12	mg/L	0.02	100%	3.42	0.10	6.74	0.030		
N - No3 (As N)	TOT	8	mg/L	0.02	100%	3.49	1.43	6.02	0.031	--- / 3.7	
N - No3 + No2 (As N)	DIS	12	mg/L	0.02	100%	4.61	0.20	7.28	0.041		
N - Tkn (As N)	TOT	12	mg/L	0.4	100%	38.04	25.00	54	0.337		
N - Total (As N)	TOT	12	mg/L	0.4	100%	41.33	22.60	54.1	0.366		
Organic Carbon	TOT	12	mg/L	0.5	100%	24.00	17.00	31	0.212		
P - Po4 - Ortho (As P)	DIS	12	mg/L	0	100%	3.28	1.68	3.97	0.029		
P - Po4 - Total (As P)	TOT	12	mg/L	0	100%	3.75	2.50	4.2	0.033		
pH	TOT	12	pH	0	100%	7.79	7.61	8.07	0.069		
SCBOD	DIS	12	mg/L	0	100%	9.69	5.28	43.5875	0.086		
Soluble Chemical Oxygen Demand	DIS	12	mg/L	0	100%	81.19	66.33	164.1	0.719		
Sulfide	TOT	12	mg/L	0.018	75%	0.04	0.02	0.095	0.000		
Sulphate	DIS	12	mg/L	1	100%	24.92	21.00	33	0.221		
Total/SAD Cyanide	TOT	12	mg/L	0.002	67%	0.0033	0.0025	0.0056	0.000029		
TSS	TOT	12	mg/L	1	100%	13.89	7.13	48.00	0.123		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
WAD Cyanide	TOT	12	mg/L	0.002	25%	---	---	---	---	0.001 / ---	
Aluminum	DIS	12	µg/L	0.5	100%	14.07	10.40	19.4	0.1245		
Aluminum	TOT	12	µg/L	0.5	100%	27.72	18.50	44.8	0.2453		
Antimony	DIS	12	µg/L	0.02	100%	0.30	0.24	0.453	0.0026		
Antimony	TOT	12	µg/L	0.02	100%	0.31	0.25	0.486	0.0027		
Arsenic	DIS	12	µg/L	0.02	100%	0.51	0.38	0.743	0.0045		
Arsenic	TOT	12	µg/L	0.02	100%	0.52	0.37	0.727	0.0046	--- / 12.5	--- / 12.5
Barium	DIS	12	µg/L	0.02	100%	2.55	1.36	4.04	0.0226		
Barium	TOT	12	µg/L	0.02	100%	4.17	2.38	6.93	0.0369		
Bismuth	DIS	12	µg/L	0.005	100%	0.17	0.05	0.233	0.0015		
Boron	DIS	12	µg/L	10	100%	149.25	117.00	246	1.3208		
Cadmium	DIS	12	µg/L	0.005	100%	0.015	0.010	0.0242	0.00013		
Cadmium	TOT	12	µg/L	0.005	100%	0.027	0.016	0.0475	0.00024	--- / 0.12a	--- / 0.12
Calcium	DIS	12	mg/L	0.05	100%	19.70	15.90	27.6	0.1743		
Calcium	TOT	12	mg/L	0.05	100%	19.78	15.90	28.7	0.1751		
Chromium	DIS	12	µg/L	0.1	100%	1.16	0.44	2.65	0.0103		
Chromium	TOT	12	µg/L	0.1	100%	1.46	0.62	2.94	0.0129		
Chromium III	TOT	12	mg/L	0.00099	58%	0.00	0.0010	0.0021	0.000012		
Cobalt	DIS	12	µg/L	0.005	100%	0.56	0.42	0.841	0.0050		
Cobalt	TOT	12	µg/L	0.005	100%	0.59	0.41	0.869	0.0052		
Copper	DIS	12	µg/L	0.05	100%	12.55	8.14	17.2	0.1111		
Copper	TOT	12	µg/L	0.05	100%	16.10	10.30	22.7	0.1425	3 / 2	
Iron	DIS	12	µg/L	1	100%	391	252	475	3.4572		
Iron	TOT	12	µg/L	1	100%	689	488	879	6.0973		
Lead	DIS	12	µg/L	0.005	100%	0.27	0.16	0.329	0.0024		
Lead	TOT	12	µg/L	0.005	100%	0.45	0.38	0.548	0.0040	140 / 2	
Lithium	DIS	12	µg/L	0.5	100%	2.44	1.85	3.66	0.0216		
Magnesium	DIS	12	µg/L	50	100%	7261	5650	9520	64.26		
Magnesium	TOT	12	µg/L	50	100%	7263	5570	9240	64.28	--- / 100a	
Manganese	DIS	12	µg/L	0.05	100%	40.18	19.10	50.1	0.3556		
Manganese	TOT	12	µg/L	0.05	100%	45.84	35.60	61.4	0.4057		
Mercury	DIS	12	µg/L	0.0019	92%	0.0038	0.0019	0.0058	0.000034		
Mercury	TOT	12	µg/L	0.0019	100%	0.0069	0.0046	0.0089	0.000061	--- / 0.02	--- / 0.016
Molybdenum	DIS	12	µg/L	0.05	100%	1.44	0.84	2.08	0.0128		
Molybdenum	TOT	12	µg/L	0.05	100%	1.46	0.91	2.18	0.0129		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Monobutyltin Trichloride	TOT	4	µg/L	0.001	100%	0.040	0.018	0.073	0.0004		
Nickel	DIS	12	µg/L	0.02	100%	3.28	2.89	4.3	0.0291		
Nickel	TOT	12	µg/L	0.02	100%	3.25	2.69	4.37	0.02875	--- / 8.3a	
Phosphorus	DIS	12	µg/L	2	100%	3693	987	5180	32.682		
Phosphorus	TOT	12	µg/L	2	100%	3903	1230	5330	34.543		
Potassium	DIS	12	mg/L	0.05	100%	15.28	9.84	18.6	0.13521		
Potassium	TOT	12	mg/L	0.05	100%	14.97	9.97	18.5	0.13250		
Selenium	DIS	12	µg/L	0.04	100%	0.16	0.12	0.191	0.00145		
Selenium	TOT	12	µg/L	0.04	100%	0.18	0.14	0.213	0.00163	--- / 2	
Silicon	DIS	12	µg/L	50	100%	3701	3130	4790	32.75		
Silver	DIS	12	µg/L	0.005	100%	0.033	0.0090	0.0726	0.00029		
Silver	TOT	12	µg/L	0.005	100%	0.051	0.024	0.106	0.00045	3.7 / 0.5	7.5 / ---
Sodium	DIS	12	mg/L	0.05	100%	53.32	43.00	70.5	0.47183		
Sodium	TOT	8	mg/L	0.05	100%	51.21	41.90	59.2	0.45321		
Strontium	DIS	12	µg/L	0.05	100%	78.47	52.30	116	0.69440		
Sulfur	DIS	12	mg/L	3	100%	8.93	7.30	11.5	0.07906		
Sulfur	TOT	8	mg/L	3	100%	8.61	7.10	10.5	0.07622		
Tin	DIS	12	µg/L	0.2	100%	0.69	0.41	1.11	0.00608		
Tin	TOT	12	µg/L	0.2	100%	0.70	0.52	1.18	0.00623		
Titanium	DIS	12	µg/L	0.5	100%	1.32	0.51	2.94	0.01169		
Uranium	DIS	12	µg/L	0.002	100%	0.015	0.0035	0.0428	0.00013		
Vanadium	DIS	12	µg/L	0.2	100%	0.54	0.25	0.91	0.00480	--- / 5a	
Zinc	DIS	12	µg/L	0.1	100%	26.98	20.30	35.7	0.23879		
Zinc	TOT	12	µg/L	0.1	100%	30.67	23.60	39	0.27139	55 / 10	
Zirconium	DIS	7	µg/L	0.1	100%	0.35	0.24	0.47	0.00311		
1,2,3,4-Tetrachlorobenzene	TOT	4	ng/L	0.0108	100%	0.038	0.032	0.045	0.00034		
1,2,3-Trichlorobenzene	TOT	4	ng/L	0.0108	100%	0.092	0.032	0.194	0.00081		
1,2,4,5-/1,2,3,5-Tetrachlorobenzene	TOT	4	ng/L	0.0108	100%	0.021	0.016	0.028	0.00019		
1,3,5-Trichlorobenzene	TOT	4	ng/L	0.0108	100%	0.040	0.0290	0.0500	0.00036		
1,7-Dimethylxanthine	TOT	4	ng/L	5.52	100%	5758	3850	8280	50.95		
Pentachlorobenzene	TOT	4	ng/L	0.0108	100%	0.042	0.033	0.054	0.00037		
Perfluorobutanoic acid	TOT	4	ng/L	1.48	100%	22.78	11.70	33.2	0.20155		
Trans-Chlordane	TOT	4	ng/L	0.0108	100%	0.057	0.048	0.063	0.00050		
Trans-Nonachlor	TOT	4	ng/L	0.0108	100%	0.037	0.028	0.045	0.00033		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Androstenedione	TOT	4	ng/L	0.925	75%	6.73	1.56	14.6	0.0595		
Progesterone	TOT	4	ng/L	0.47	100%	2.51	1.20	5.10	0.0222		
Total Phenols	TOT	12	mg/L	0.0015	100%	0.0040	0.0023	0.0069	0.000035		
Conductivity	TOT	11	µS/cm	2	100%	764.55	630.00	910	6.765889		
1,2,3,4,6,7,8-HPCDD	TOT	4	pg/L	0.2	100%	6.39	1.20	8.67	0.056549		
1,2,3,4,6,7,8-HPCDF	TOT	4	pg/L	0.2	75%	0.42	0.20	0.617	0.003730		
1,2,3,7,8-PECDF	TOT	4	pg/L	0.2	75%	0.25	0.20	0.302	0.00218		
1-Methylphenanthrene	TOT	4	ng/L	0.0792	100%	2.56	1.47	3.4	0.02268		
2,3,5-trimethylnaphthalene	TOT	4	ng/L	0.166	100%	5.72	3.01	11.4	0.05062		
2,4-DDD	TOT	4	ng/L	0.0108	100%	0.070	0.034	0.137	0.00062		
2,4-DDT	TOT	4	ng/L	0.0108	100%	0.036	0.026	0.049	0.00031		
2,6-dimethylnaphthalene	TOT	4	ng/L	0.22	100%	7.07	2.37	17.1	0.06254		
2-Hydroxy-Ibuprofen	TOT	4	ng/L	4.95	100%	5252.50	3660.00	7120	46.482		
2-Methylnaphthalene	TOT	12	ng/L	0.152	67%	10	10	23.15	0.105		
3:3 FTCA	TOT	4	ng/L	1.48	50%	2.78	1.48	5.61	0.02458		
4,4-DDD	TOT	4	ng/L	0.0108	100%	0.0360	0.0310	0.0410	0.000319		
4,4-DDE	TOT	4	ng/L	0.0108	100%	0.274	0.182	0.491	0.00242		
4,4-DDT	TOT	4	ng/L	0.0108	100%	0.18	0.07	0.331	0.00159		
4-n-Octylphenol	TOT	4	ng/L	0.63	50%	1.43	0.88	2.85	0.01268		
4-Nonylphenol Diethoxylates	TOT	4	ng/L	1.73	100%	197.70	65.80	497	1.750		
4-Nonylphenol Monoethoxylates	TOT	4	ng/L	1.44	100%	678.50	359.00	1180	6.004		
5:3 FTCA	TOT	4	ng/L	9.23	100%	81.70	43.00	168	0.72301		
6:2 FTS	TOT	4	ng/L	1.33	100%	3.81	1.48	7	0.03369		
ABHC	TOT	4	ng/L	0.0132	75%	0.031	0.013	0.065	0.00027		
Acenaphthene	TOT	12	µg/L	0.000252	92%	0.023	0.010	0.053	0.00021	--- / 6	
Acetaminophen	TOT	4	ng/L	2.76	100%	113.25	63.40	210	1.00221		
Aldrin	TOT	4	ng/L	0.0108	100%	0.038	0.027	0.050	0.00033		
Alpha Chlordane	TOT	4	ng/L	0.0108	100%	0.0585	0.0350	0.11	0.00052		
Azithromycin	TOT	4	ng/L	1.5	100%	213.85	85.40	279	1.89248		
Benzo[a]pyrene	TOT	12	µg/L	0.0000419	67%	0.0078	0.0034	0.021	0.00007	--- / 0.01	
Benzo[e]pyrene	TOT	4	ng/L	0.0418	100%	1.83	1.15	2.6	0.01622		
Benzo[J,K]Fluoranthenes	TOT	4	ng/L	0.0323	100%	1.33	0.70	1.84	0.01173		
Beta-Endosulfan	TOT	4	ng/L	0.0108	50%	0.013	0.011	0.016	0.00011		
Beta-Hch Or Beta-Bhc	TOT	4	ng/L	0.0153	100%	0.099	0.076	0.12	0.00088		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Bisphenol A	TOT	4	ng/L	5.52	100%	3438	153	6330	30.43	--- / 900	
Caffeine	TOT	4	ng/L	5.52	100%	8515.00	3720.00	13000	75.35		
Carbamazepine	TOT	4	ng/L	0.276	100%	349.25	211.00	430	3.09		
Ciprofloxacin	TOT	4	ng/L	1.38	100%	178	136	230	1.58		
Clarithromycin	TOT	4	ng/L	0.276	100%	121.55	96.20	179	1.07566		
Decachloro Biphenyl	TOT	3	pg/L	NA	100%	4.24	2.49	5.34	0.03755		
Dehydronifedipine	TOT	4	ng/L	0.276	100%	2.52	2.01	3.37	0.02226		
Dibenzothiophene	TOT	4	ng/L	0.0717	100%	4.03	2.40	5.69	0.03562		
Dichloro Biphenyls	TOT	4	pg/L	NA	100%	200.25	158.00	275	1.77212		
Dieldrin	TOT	4	ng/L	0.0108	100%	0.20	0.18	0.23	0.00179		
Diethyl Phthalate	TOT	12	µg/L	0.2	58%	0.32	0.25	0.54	0.00282		
Diltiazem	TOT	4	ng/L	0.138	100%	191.25	125.00	236	1.69248		
Diphenhydramine	TOT	4	ng/L	0.552	100%	570.00	332.00	703	5.04425		
Endrin Aldehyde	TOT	4	ng/L	0.0117	100%	0.12	0.08	0.214	0.00103		
Enrofloxacin	TOT	4	ng/L	0.552	75%	0.786	0.695	0.993	0.00696		
Erythromycin-H2O	TOT	4	ng/L	1.38	100%	10.33	3.96	14.4	0.091		
Estrone	TOT	4	ng/L	2.93	75%	9.45	3.27	18.2	0.08358		
Fluoranthene	TOT	12	µg/L	0.0000348	92%	0.021	0.010	0.029	0.00018		
Fluorene	TOT	12	µg/L	0.000078	92%	0.047	0.010	0.22	0.00042	--- / 12	
Fluoxetine	TOT	4	ng/L	0.138	100%	34.38	21.30	43.3	0.30420		
Furosemide	TOT	4	ng/L	3.68	100%	477.25	254.00	619	4.223		
Gemfibrozil	TOT	4	ng/L	0.736	100%	11.00	4.20	15.1	0.09735		
Glyburide	TOT	4	ng/L	0.736	100%	4.06	1.34	10.5	0.03595		
HCH, Gamma	TOT	4	ng/L	0.0132	100%	0.10	0.045	0.14	0.00086		
Heptachlor Epoxide	TOT	4	ng/L	0.0108	100%	0.035	0.018	0.065	0.00031		
Heptachloro Biphenyls	TOT	4	pg/L	NA	100%	74.50	58.90	81.6	0.65929		
Hepta-Dioxins	TOT	4	pg/L	NA	100%	14.29	2.27	20.3	0.12648		
Hepta-Furans	TOT	4	pg/L	0.2	75%	1.01	0.20	1.62	0.00896		
Hexachloro Biphenyls	TOT	4	pg/L	NA	100%	207.75	177.00	221	1.83850		
Hexachlorobenzene	TOT	4	ng/L	0.0108	100%	0.070	0.057	0.081	0.00062		
Hexa-Dioxins	TOT	4	pg/L	0.2	75%	2.71	0.20	4.37	0.02400		
Hexa-Furans	TOT	4	pg/L	0.2	50%	0.24	0.20	0.294	0.00209		
High Molecular Weight PAH`s	TOT	12	µg/L	0.02	83%	0.08	0.02	0.22	0.00070		
Hydrochlorothiazide	TOT	4	ng/L	3.68	100%	949.25	676.00	1100	8.40044		
Ibuprofen	TOT	4	ng/L	3.68	100%	1286.75	857.00	2140	11.38717		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Lincomycin	TOT	4	ng/L	0.552	100%	5.90	1.23	10.2	0.05219		
Low Molecular Weight PAH`s	TOT	12	µg/L	0.01	100%	0.16	0.03	0.39	0.00140		
Methoxyclor	TOT	4	ng/L	0.0108	100%	0.052	0.037	0.060	0.00046		
Miconazole	TOT	4	ng/L	0.276	100%	2.88	0.75	3.75	0.02548		
Monochloro Biphenyls	TOT	4	pg/L	NA	100%	69.82	5.88	153	0.618		
Naphthalene	TOT	12	µg/L	0.000109	92%	0.026	0.010	0.045	0.00023	--- / 1	--- / 1.4
Naproxen	TOT	4	ng/L	1.84	100%	1727	1470	2240	15.28		
Nonachloro Biphenyls	TOT	4	pg/L	NA	100%	7.26	4.61	9.27	0.0643		
Np	TOT	4	ng/L	0.7	100%	111.78	65.90	179	0.9892		
OCDD	TOT	4	pg/L	0.2	100%	56.36	7.13	80.2	0.4988		
OCDF	TOT	4	pg/L	0.2	100%	1.02	0.29	1.49	0.00907		
Octachloro Biphenyls	TOT	4	pg/L	NA	100%	18.85	12.10	22.5	0.1668		
Ofloxacin	TOT	4	ng/L	0.552	100%	37.33	21.60	50.8	0.330		
Pbde 100	TOT	4	pg/L	1.31	100%	671	374	846	5.93		
Pbde 119/120	TOT	4	pg/L	1.31	100%	6.33	4.56	8.07	0.056		
Pbde 12/13	TOT	4	pg/L	1.31	75%	2.13	1.52	3.64	0.019		
Pbde 138/166	TOT	4	pg/L	1.31	100%	33.73	21.20	41	0.299		
Pbde 140	TOT	4	pg/L	1.31	100%	10.87	7.08	13.3	0.0962		
Pbde 15	TOT	4	pg/L	1.31	100%	5.04	3.88	6.59	0.0446		
Pbde 153	TOT	4	pg/L	1.31	100%	297.75	174.00	398	2.635		
Pbde 154	TOT	4	pg/L	1.31	100%	251.50	146.00	336	2.226		
Pbde 155	TOT	4	pg/L	1.31	100%	18.15	9.18	25.1	0.161		
Pbde 17/25	TOT	4	pg/L	1.31	100%	33.53	23.90	53.1	0.297		
Pbde 183	TOT	4	pg/L	1.31	100%	46.40	31.80	55	0.411		
Pbde 203	TOT	4	pg/L	1.5	100%	29.30	25.30	33.9	0.259		
Pbde 206	TOT	4	pg/L	2.63	100%	169.75	110.00	250	1.502		
Pbde 207	TOT	4	pg/L	2.86	100%	173.28	82.10	286	1.533		
Pbde 208	TOT	4	pg/L	3.32	100%	102.08	53.30	163	0.903		
Pbde 209	TOT	4	pg/L	16.1	100%	2402	1590	4100	21.2		
Pbde 28/33	TOT	4	pg/L	1.31	100%	53.98	31.80	63.2	0.478		
Pbde 37	TOT	4	pg/L	1.31	75%	2.48	1.85	3.64	0.0220		
Pbde 47	TOT	4	pg/L	1.31	100%	3402	1730	4160	30.1		
Pbde 49	TOT	4	pg/L	1.31	100%	113	89.1	139	1.00		
Pbde 51	TOT	4	pg/L	1.31	100%	12.5	8.85	15.5	0.111		
Pbde 66	TOT	4	pg/L	1.31	100%	59.53	38.60	70.8	0.527		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Pbde 7	TOT	2	pg/L	1.31	50%	3.59	3.54	3.64	0.0318		
Pbde 71	TOT	4	pg/L	1.31	100%	12.95	6.28	16.1	0.115		
Pbde 75	TOT	4	pg/L	1.31	100%	5.36	4.13	5.8	0.0474		
Pbde 79	TOT	4	pg/L	1.31	50%	3.15	1.31	4.26	0.02785		
Pbde 8/11	TOT	4	pg/L	1.31	75%	2.58	1.85	3.64	0.02283		
Pbde 85	TOT	4	pg/L	1.31	100%	124.3	73.4	160	1.10		
Pbde 99	TOT	4	pg/L	1.31	100%	3177	1660	4010	28.12		
PCB	TOT	4	pg/L	0.212	100%	27.56	5.55	51.2	0.244	100 / ---	
PCB10	TOT	4	pg/L	0.212	100%	0.84	0.50	1.15	0.0074		
PCB103	TOT	4	pg/L	0.212	75%	0.53	0.45	0.671	0.00470		
PCB104	TOT	4	pg/L	0.212	75%	0.40	0.31	0.5	0.00352		
PCB105	TOT	4	pg/L	0.274	100%	12.30	10.00	13.9	0.10885	90 / ---	
PCB107	TOT	4	pg/L	0.274	100%	2.00	1.79	2.25	0.0177		
PCB-108 + 124	TOT	4	pg/L	0.274	100%	1.59	1.34	1.8	0.0141		
PCB11	TOT	4	pg/L	0.212	100%	129.23	87.90	177	1.144		
PCB110/115	TOT	4	pg/L	0.212	100%	51.45	45.00	62	0.455		
PCB111	TOT	4	pg/L	0.212	50%	129.23	87.90	177	1.144		
PCB114	TOT	4	pg/L	0.274	100%	1.06	0.94	1.17	0.00936		
PCB118	TOT	4	pg/L	0.274	100%	31.50	27.50	34.2	0.27876		
PCB12/13	TOT	4	pg/L	0.212	100%	4.53	3.33	5.63	0.04011		
PCB121	TOT	4	pg/L	0.212	75%	0.55	0.45	0.601	0.00485		
PCB123	TOT	4	pg/L	0.274	100%	0.68	0.48	0.823	0.00598		
PCB128/166	TOT	4	pg/L	0.212	100%	7.16	5.51	10.2	0.06338		
PCB129/138/160/163	TOT	4	pg/L	0.212	100%	44.15	35.50	52.5	0.39071		
PCB130	TOT	4	pg/L	0.212	100%	2.62	2.32	2.8	0.02314		
PCB131	TOT	4	pg/L	0.212	100%	0.83	0.67	0.952	0.00736		
PCB132	TOT	4	pg/L	0.212	100%	14.25	12.30	16	0.12611		
PCB133	TOT	4	pg/L	0.212	100%	0.98	0.71	1.24	0.00869		
PCB134/143	TOT	4	pg/L	0.212	100%	2.54	1.88	3.19	0.02248		
PCB135/151/154	TOT	4	pg/L	0.212	100%	16.93	14.00	19.1	0.14978		
PCB136	TOT	4	pg/L	0.212	100%	7.33	5.97	8.46	0.06482		
PCB137	TOT	4	pg/L	0.212	100%	2.22	2.01	2.53	0.01960		
PCB139/140	TOT	4	pg/L	0.212	100%	1.25	1.05	1.51	0.01108		
PCB14	TOT	4	pg/L	0.212	100%	0.78	0.48	1.4	0.00689		
PCB141	TOT	4	pg/L	0.212	100%	7.51	5.84	8.43	0.06646		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
PCB144	TOT	4	pg/L	0.212	100%	2.76	2.30	3.26	0.02442		
PCB146	TOT	4	pg/L	0.212	100%	6.26	5.67	6.85	0.05540		
PCB147/149	TOT	4	pg/L	0.212	100%	32.50	29.10	36.7	0.28761		
PCB148	TOT	4	pg/L	0.212	50%	0.43	0.30	0.498	0.00378		
PCB15	TOT	4	pg/L	0.212	100%	9.63	8.59	11.5	0.08524		
PCB150	TOT	4	pg/L	0.212	50%	0.38	0.30	0.446	0.00335		
PCB152	TOT	4	pg/L	0.212	75%	1.63	0.45	4.21	0.01442		
PCB153/168	TOT	4	pg/L	0.212	100%	42.30	33.50	49.8	0.37434		
PCB155	TOT	4	pg/L	0.212	100%	4.89	3.19	5.9	0.04330		
PCB156157	TOT	4	pg/L	0.213	100%	5.15	3.77	6.77	0.04555		
PCB158	TOT	4	pg/L	0.212	100%	3.58	2.95	3.88	0.03166		
PCB159	TOT	4	pg/L	0.212	50%	0.94	0.21	2.47	0.00829		
PCB16	TOT	4	pg/L	0.212	100%	13.88	11.70	16.5	0.12279		
PCB164	TOT	4	pg/L	0.212	100%	2.42	1.81	2.73	0.02144		
PCB167	TOT	4	pg/L	0.212	100%	1.68	1.23	2.41	0.01485		
PCB17	TOT	4	pg/L	0.212	100%	12.80	10.10	16.5	0.11327		
PCB170	TOT	4	pg/L	0.212	100%	7.03	5.10	8.43	0.06223		
PCB171/173	TOT	4	pg/L	0.212	100%	2.14	1.56	2.46	0.01896		
PCB172	TOT	4	pg/L	0.228	100%	1.48	1.16	1.9	0.01305		
PCB174	TOT	4	pg/L	0.212	100%	35.43	8.08	84.7	0.31352		
PCB175	TOT	4	pg/L	0.219	75%	0.44	0.38	0.539	0.00387		
PCB176	TOT	4	pg/L	0.213	100%	1.46	1.13	1.72	0.01290		
PCB177	TOT	4	pg/L	0.214	100%	4.61	3.56	5.16	0.04077		
PCB178	TOT	4	pg/L	0.244	100%	2.53	2.10	3.00	0.02241		
PCB179	TOT	4	pg/L	0.213	100%	5.01	4.12	6.22	0.04436		
PCB18/30	TOT	4	pg/L	0.212	100%	39.03	30.60	51.2	0.34535		
PCB180/193	TOT	4	pg/L	0.228	100%	21.38	15.10	26	0.18916		
PCB183/185	TOT	4	pg/L	0.225	100%	6.34	4.98	7.3	0.05613		
PCB184	TOT	4	pg/L	0.223	100%	7.60	5.10	9.85	0.06721		
PCB187	TOT	4	pg/L	0.225	100%	13.80	10.50	15.7	0.12212		
PCB189	TOT	4	pg/L	0.274	50%	0.42	0.30	0.702	0.00369		
PCB19	TOT	4	pg/L	0.212	100%	4.92	3.49	6.68	0.04352		
PCB190	TOT	4	pg/L	0.256	100%	1.83	1.10	2.59	0.01617		
PCB194	TOT	4	pg/L	0.274	100%	5.05	3.06	6.27	0.04471		
PCB195	TOT	4	pg/L	0.274	100%	1.47	0.90	1.92	0.01303		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
PCB196	TOT	4	pg/L	0.267	100%	2.18	1.42	2.77	0.01931		
PCB197/200	TOT	4	pg/L	0.255	100%	1.37	1.04	1.88	0.01208		
PCB198/199	TOT	4	pg/L	0.274	100%	5.88	4.07	7.8	0.05204		
PCB2	TOT	4	pg/L	0.212	100%	9.51	1.89	14.7	0.08418		
PCB20/28	TOT	4	pg/L	0.212	100%	31.83	27.50	39.6	0.28164		
PCB201	TOT	4	pg/L	0.253	100%	0.73	0.53	1.08	0.00647		
PCB202	TOT	4	pg/L	0.261	100%	1.77	1.28	2.19	0.01562		
PCB203	TOT	4	pg/L	0.274	100%	3.83	2.43	5.27	0.03389		
PCB204	TOT	4	pg/L	0.267	50%	0.44	0.30	0.691	0.00388		
PCB206	TOT	4	pg/L	0.274	100%	5.49	3.51	6.9	0.04858		
PCB207	TOT	4	pg/L	0.274	75%	0.57	0.45	0.761	0.00507		
PCB208	TOT	4	pg/L	0.274	100%	1.77	1.10	2.37	0.01566		
PCB209	TOT	4	pg/L	0.274	100%	5.18	2.49	8	0.04586		
PCB21/33	TOT	4	pg/L	0.212	100%	25.68	19.60	31.6	0.22721		
PCB22	TOT	4	pg/L	0.212	100%	14.93	12.80	18.7	0.13208		
PCB24	TOT	4	pg/L	0.212	100%	0.43	0.34	0.514	0.00382		
PCB25	TOT	4	pg/L	0.212	100%	4.76	3.77	6.33	0.04212		
PCB26/29	TOT	4	pg/L	0.212	100%	7.26	5.86	9.2	0.06427		
PCB27	TOT	4	pg/L	0.212	100%	3.30	2.29	4.37	0.02916		
PCB3	TOT	4	pg/L	0.212	100%	39.85	3.99	102	0.35263		
PCB31	TOT	4	pg/L	0.212	100%	34.98	31.20	41.7	0.30951		
PCB32	TOT	4	pg/L	0.212	100%	8.83	7.14	11.1	0.07814		
PCB35	TOT	4	pg/L	0.212	100%	3.49	3.20	3.79	0.03091		
PCB36	TOT	4	pg/L	0.212	100%	0.80	0.67	0.908	0.00704		
PCB37	TOT	4	pg/L	0.212	100%	8.81	7.31	11.1	0.07799		
PCB4	TOT	4	pg/L	0.212	100%	24.20	11.60	37.6	0.21416		
PCB40/41/71	TOT	4	pg/L	0.212	100%	15.83	13.30	20.4	0.14004		
PCB42	TOT	4	pg/L	0.212	100%	8.58	7.39	11	0.07588		
PCB43	TOT	4	pg/L	0.212	100%	1.24	1.01	1.59	0.01100		
PCB44/47/65	TOT	4	pg/L	0.212	100%	175.25	108.00	271	1.551		
PCB45/51	TOT	4	pg/L	0.212	100%	38.75	22.00	64.6	0.34292		
PCB46	TOT	4	pg/L	0.212	100%	2.17	1.80	2.84	0.01916		
PCB48	TOT	4	pg/L	0.212	100%	6.57	5.54	8.1	0.05812		
PCB49/69	TOT	4	pg/L	0.212	100%	25.45	22.50	32.1	0.22522		
PCB5	TOT	4	pg/L	0.212	100%	0.99	0.72	1.21	0.00879		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
PCB50/53	TOT	4	pg/L	0.212	100%	5.51	4.78	6.76	0.04878		
PCB52	TOT	4	pg/L	0.212	100%	61.38	50.70	72.2	0.54314		
PCB55	TOT	4	pg/L	0.212	100%	0.81	0.65	1.03	0.00717		
PCB56	TOT	4	pg/L	0.212	100%	10.57	8.37	13.6	0.09352		
PCB59/62/75	TOT	4	pg/L	0.212	100%	3.45	2.87	4.58	0.0305		
PCB6	TOT	4	pg/L	0.212	100%	5.76	4.55	6.88	0.0510		
PCB60	TOT	4	pg/L	0.212	100%	6.95	5.49	8.72	0.0615		
PCB61/70/74/76	TOT	4	pg/L	0.212	100%	48.98	41.90	60.6	0.4334		
PCB63	TOT	4	pg/L	0.212	100%	1.22	1.09	1.49	0.0108		
PCB64	TOT	4	pg/L	0.212	100%	14.70	11.80	18.3	0.1301		
PCB66	TOT	4	pg/L	0.212	100%	30.85	28.10	33.3	0.2730		
PCB67	TOT	4	pg/L	0.212	100%	1.17	1.07	1.28	0.0103		
PCB68	TOT	4	pg/L	0.212	100%	19.78	10.20	35.5	0.1750		
PCB7	TOT	4	pg/L	0.212	100%	7.28	2.97	17.1	0.0644		
PCB77	TOT	4	pg/L	0.212	100%	2.47	2.05	2.85	0.0219	40 / ---	
PCB8	TOT	4	pg/L	0.212	100%	16.03	11.60	19.7	0.1418		
PCB82	TOT	4	pg/L	0.212	100%	5.34	4.32	6.66	0.0472		
PCB83/99	TOT	4	pg/L	0.212	100%	24.43	22.90	27.2	0.2162		
PCB84	TOT	4	pg/L	0.212	100%	11.79	8.56	14.8	0.1043		
PCB85/116/117	TOT	4	pg/L	0.212	100%	8.43	7.89	9.39	0.0746		
PCB86/87/97/108/119/125	TOT	4	pg/L	0.212	100%	91.45	41.80	113	0.8093		
PCB88/91	TOT	4	pg/L	0.212	100%	6.82	5.37	8.38	0.0603		
PCB89	TOT	4	pg/L	0.212	75%	0.62	0.42	0.893	0.0055		
PCB9	TOT	4	pg/L	0.212	100%	2.37	1.74	3.03	0.0210		
PCB90/101/113	TOT	4	pg/L	0.212	100%	52.28	47.40	60	0.4626		
PCB92	TOT	4	pg/L	0.212	100%	10.32	8.56	12.1	0.0913		
PCB93/95/98/100/102	TOT	4	pg/L	0.212	100%	45.93	35.70	51.7	0.4064		
PCB94	TOT	4	pg/L	0.212	75%	0.35	0.28	0.446	0.0031		
PCB96	TOT	4	pg/L	0.212	75%	0.47	0.44	0.537	0.0041		
PCBs Total	TOT	4	pg/L	NA	100%	1512.50	1240.00	1790	13.3850		
PCBTeq 3	TOT	4	pg/L	NA	100%	0.05	0.01	0.0944	0.0005		
PCBTeq 4	TOT	4	pg/L	NA	100%	0.24	0.19	0.26855	0.0021		
Penicillin G	TOT	3	ng/L	2.76	67%	3.89	2.76	4.69	0.0344		
Pentachloro Biphenyls	TOT	4	pg/L	NA	100%	263.25	206.00	351	2.3296		
Penta-Dioxins	TOT	4	pg/L	0.2	50%	0.31	0.20	0.425	0.0027		

Table 2.4, cont'd

Parameter	State	N	Unit	MDL	Frequency of Detection	Average Concentration	Minimum Concentration	Maximum Concentration	113:1 Dilution	BC WQG (STA/LTC)	CCME/HC WQG (ST/LT)
Penta-Furans	TOT	4	pg/L	0.2	50%	0.24	0.20	0.302	0.0021		
Perylene	TOT	4	ng/L	0.0468	50%	0.47	0.18	0.784	0.0042		
PFBS	TOT	4	ng/L	0.369	100%	17.94	0.94	32.6	0.1587		
PFDA	TOT	4	ng/L	0.369	100%	1.17	0.49	1.75	0.0104		
PFHpA	TOT	4	ng/L	0.369	100%	5.88	1.05	9.23	0.0521		
PFHxA	TOT	4	ng/L	0.369	100%	38.50	6.58	64.5	0.3407		
PFHxS	TOT	4	ng/L	0.425	100%	9.60	1.36	16.8	0.0850		
PFNA	TOT	4	ng/L	0.369	100%	1.02	0.47	1.46	0.0090		
PFOA	TOT	4	ng/L	0.369	100%	15.04	2.55	22.7	0.1331		
PFOS	TOT	4	ng/L	0.369	100%	4.91	1.82	9.39	0.0434		
PFPeA	TOT	4	ng/L	0.738	100%	22.56	6.62	38.1	0.1996		
Phenanthrene	TOT	12	µg/L	0.000169	92%	0.03	0.02	0.062	0.0003		
Pyrene	TOT	12	µg/L	0.0000337	92%	0.02	0.01	0.08105	0.0002		
Roxithromycin	TOT	4	ng/L	0.154	100%	2.44	1.47	4.34	0.0216		
Sulfadiazine	TOT	4	ng/L	0.552	50%	0.93	0.55	1.59	0.0082		
Sulfamethoxazole	TOT	4	ng/L	0.608	100%	449.75	231.00	575	3.9801		
Sulfanilamide	TOT	4	ng/L	5.52	100%	54.33	30.90	73.9	0.4808		
Tetrachloro Biphenyls	TOT	4	pg/L	NA	100%	456.75	348.00	666	4.0420		
Thiabendazole	TOT	4	ng/L	0.3	100%	27.28	16.80	36.4	0.2414		
Total PAH	TOT	12	µg/L	0.02	92%	0.23	0.07	0.48	0.0020		
Trichloro Biphenyls	TOT	4	pg/L	NA	100%	209.50	162.00	258	1.8540		
Triclocarban	TOT	4	ng/L	0.368	100%	1.38	0.76	2.1	0.0122		
Triclosan	TOT	4	ng/L	5.52	100%	13.85	10.90	16.5	0.1226		
Trimethoprim	TOT	4	ng/L	0.304	100%	213.00	147.00	267	1.8850		
Tylosin	TOT	4	ng/L	0.552	50%	1.32	0.56	3.51	0.0117		
Warfarin	TOT	4	ng/L	0.368	100%	2.12	1.48	2.43	0.0187		

Notes:
*Dilution calculated from maximum concentration.
MDL – method detection limit
NA – not applicable to calculated parameters
BC WQG = British Columbia Water Quality Guidelines for protection of marine aquatic life. Approved guidelines unless otherwise stated.
CCME WQG = Canadian Council of Ministers of the Environment water quality guidelines for protection of marine aquatic life.
HC = Health Canada Recreational Water Quality Guideline
a. working guideline
*Guidelines are maximum concentrations unless otherwise stated.
Purple shading indicates exceedance to BC WQG or CCME/HC WQG.

2.3.4 Acute Toxicity Testing

Monthly toxicity test results provide information on the effects of MPWWTP final treated effluent at the organism level. Acute toxicity tests measure the adverse health effects from a single exposure or from repeated exposure to a toxicant or mixture of toxicants over a short period of an organism's life. Acute toxicity results for the MPWWTP final effluent are reported as the lethal concentration 50 (LC50). The LC50 represents the effluent concentration that causes 50% mortality within the test period. An LC50 result that is less than 100% effluent is considered a failure. Some 96-hour rainbow trout lethality tests were carried out as a single 100% concentration screening. The test result is reported as percent survival in 100% sample with <50% survival at 96-hours considered a failure. Refer to Appendix B7 for acute toxicity reports.

Single concentration 96-hour rainbow trout lethality tests were acceptable for all 2025 samples as shown in Table 2.5.

Daphnia magna toxicity testing is not a regulatory requirement but is conducted as part of expanded EMP commitments. The *Daphnia magna* 48-hour LC50 results were >100% for all 2025 samples (Table 2.5).

Table 2.5 McLoughlin Point WWTP Acute Toxicity Test Results – 2025

Sample Date	Rainbow trout (pH stabilized)		*Daphnia magna*
	96 hour LC50 (95%CL) (%v/v) pH Stabilized*	96 hour (%) survival in 100% Effluent**	48 hour LC50 (95%CL) (%v/v)*
January 21, 2025	---	70	>100
February 26, 2025	---	100	>100
March 20, 2025	>100	---	>100
April 28, 2025	>100	---	>100
May 28, 2025	---	90	>100
June 24, 2025	---	100	>100
July 16, 2025	---	90	>100
August 27, 2025	---	100	>100
September 18, 2025	---	***	>100
October 2, 2025	---	100	---
October 30, 2025	---	100	>100
November 20, 2025	---	80	>100
December 10, 2025	---	90	>100

Notes:
*Test pass = >100%.
**Test pass = >50%
***Laboratory test error – resampled for Rainbow trout test only on October 2, 2025
Results are presented as v/v%.
Shaded cells indicated test failure.
--- Test not conducted.

2.3.5 Chronic Toxicity Testing

Chronic toxicity tests measure adverse health effects from continuous or repeated exposures to a toxicant or mixture of toxicants over a significant portion of an organism's life. These results provide information about the toxicity of the effluent at the whole-organism scale in the immediate vicinity of the outfall. Chronic toxicity results are reported here as LC50 for lethal endpoints. Sublethal endpoints are reported as EC50, EC25 (effective concentration), and IC50 or IC25 (inhibition concentration) which are the concentrations that will have a specific non-lethal effect upon 50% or 25%, respectively, of the organisms in the specified test period (e.g., decreased fertilization or growth). All results are presented as v/v% (95% confidence limit [CL]). Refer to Appendix B7 for chronic toxicity reports.

Chronic toxicity testing was conducted using McLoughlin Point WWTP final effluent collected in December 2025. Test species and endpoints assessed included:

- Pacific topsmelt (*Atherinops affinis*) 7-day survival.
- *Ceriodaphnia dubia* 7-day survival and reproduction.
- Echinoderm (*Strongylocentrotus purpuratus*) 10-minute fertilization.
- Rainbow trout (*Oncorhynchus mykiss*) 30-day embryo/alevin viability test.

The 2025 McLoughlin Point WWTP final effluent chronic toxicity test results are summarized in Table 2.6 below. The chronic toxicity test results show that chronic effects would occur only at effluent concentrations much greater than those predicted at the limits of the initial dilution zone (i.e., 0.9% v/v effluent based on the modelled dilution ratio of 113:1) (Lorax, 2019). Marine receptors outside of the initial dilution zone are expected to be protected from chronic toxicity associated with the final effluent because of the rapid plume dilution. Additionally, the range and life history of most receiving environment species would limit the duration of exposure to the undiluted effluent plume due to movement of the organism.

The results were similar in 2025 as in 2023 and 2024. Results of note include reduced toxicity to Pacific topsmelt survival and growth and increased toxicity to echinoderm fertilization.

Table 2.6 McLoughlin Point WWTP Chronic Toxicity Test Results – 2025

Endpoint	% v/v (95% CI)
7-day Pacific topsmelt	
Survival - LC50	>100
Dry Biomass - IC25	>100
Dry Biomass - IC50	>100
Dry Weight - IC25	>100
Dry Weight - IC50	>100
7-day *Ceriodaphnia dubia*	
Survival - LC50	>100
Reproduction - IC25	26.9 (<1.56 – NA)
10-minute echinoderm fertilization	
Fertilization - IC25	>67.7 (NA – NA)
Fertilization - IC50	>67.7 (NA – NA)
30-day Rainbow trout embryo-alevin	
Embryo Viability - EC25	26.1 (12.6 – 35.6)
Embryo Viability - EC50	41.2 (27.6 – 51.9)

Notes: CI = confidence interval.

2.3.6 Overall Assessment

The 2025 McLoughlin Point WWTP wastewater monitoring results continue to show improvement compared to historical Macaulay and Clover results (CRD, 2020). This trend, continuing since 2023, reflects significant improvement in wastewater effluent quality since the commissioning of the WWTP. Tertiary effluent quality requirements were generally met except for the dates and months with non-compliant maximum and average concentrations, respectively. Treatment process optimization was considered ongoing in 2025, and occasional non-compliance events were expected during this time. Additionally, source control and flow control measures in partnership with large private sector and CRD inputs such as the Hartland Residuals Treatment Facility and Hartland Landfill leachate effluent are being implemented to improve facility performance.

All effluent quality parameters were predicted to be below applicable water quality guidelines in the marine receiving environment at the edge of the initial dilution zone, except for bacteriological indicators. The use of estimated minimum initial dilution factors allows for a conservative (i.e., highly protective) estimation of potential effects in the marine receiving environment. However, predicted average initial dilution factors are much higher around the outfall (711:1 median for McLoughlin Point). This shows overall risk to human health and the environment is lower than predictions indicate. These bacteriological indicator guideline exceedances will continue as disinfection has not been installed as part of the McLoughlin treatment process. Disinfection is not feasible at Macaulay or Clover during rain-associated bypasses. Overall, the magnitude of bacteriological indicator exceedances has been greatly reduced with tertiary treatment at McLoughlin.

Overall, the 2025 results continue to indicate the MPWWTP has resulted in greater protection to human health and the environment through reduced environmental contaminant loading.

3.0 SURFACE WATER MONITORING

3.1 Introduction

CRD staff have been monitoring receiving waters around the Macaulay and Clover outfalls for fecal bacterial indicator concentrations since the early 1980s. This indicator is used as a surrogate to assess the potential for human health impacts from exposure to wastewaters in the marine receiving environment during recreational activities such as kite surfing, diving and swimming. Observed impacts at the shoreline have been attributed to stormwater discharges, which are currently monitored by the CRD's Stormwater Quality Program.

The McLoughlin Point WWTP commenced operation in August 2020. Since the beginning of 2021, surface water and IDZ sampling shifted from Clover and Macaulay receiving environments to the McLoughlin receiving environment. The IDZ is defined by BC ENV as the 100-metre radius surrounding the end of the outfall and is the area most impacted by wastewater discharge.

The Clover Point and Macaulay Point pump stations no longer serve as regular discharge points of screened wastewater. Since the construction of the MPWWTP, Clover and Macaulay only discharge directly to the receiving environment from their respective long outfalls during heavy rain events or planned overflow and bypass events during maintenance. In the event of overflow discharge from either Clover or Macaulay outfalls, surface water sampling is carried out if vessel availability and weather conditions permit. Heavy rainfall events triggering overflow discharges are often associated with unsafe boating conditions thereby often preventing sampling.

3.2 Methods

In 2025, staff collected 5 samples in 30 days ("5-in-30") in each quarter (i.e., January, April, July, and October) at the IDZ and at the surface of the receiving environment at stations around the McLoughlin outfall (Figure 3.1). Sampling was conducted using the University of Victoria's 16-m science vessel, the MSV John Strickland. Wet weather overflow or bypass sampling from Macaulay or Clover would also be carried out using this vessel if coincident with a MPWWTP sampling event.

Surface water and IDZ sampling parameters are presented in Appendix C1. For surface water sampling, CRD staff collected samples at a depth of 1 m using a sampling pole. For IDZ sampling, staff collected samples using a Seabird ECO55 rosette sampler with a SBE19PlusV2 conductivity-temperature-depth (CTD) instrument. The CTD instrument was also equipped with a SBE43 dissolved oxygen sensor. Water column profiles recorded at each IDZ station and water column samples were collected at the top (5 m below surface), middle (middle of the predicted plume trapping depth), and bottom (5 m above the seafloor) depths of the water column. CTD casts were captured at each IDZ sample station and measured the depth, conductivity, salinity, temperature and dissolved oxygen.

Surface water sampling stations are presented in Figure 3.1 and Appendix C2. The surface sampling grid, consisting of a total of 13 stations, provides adequate spatial coverage of the receiving environment where plume surfacing is most likely to occur. In addition, samples were collected at the location at which a drift drogue was retrieved each day (see Appendix C2, sample D1). Surface samples were collected in sterile, wide-mouth bottles by rapidly submerging open, upright bottles to a depth of 1 m using a sampling pole. Reference stations were also sampled at Parry Bay and at Constance Bank (Figure 3.1).

For each sampling event, the predicted current direction and plume trapping depth were determined using the CRD's hydrodynamic C3 model. The model incorporates local conditions (historical instrument data and current and tide tables) to estimate current direction and effluent trapping depth (Hodgins, 2006). The model is also updated periodically to incorporate recent analytical data. Four stations and the "middle" sampling depth were then selected to ensure that they fell within the plume's model-predicted direction of travel and trapping depth for that specific date and time. Grab samples were collected using a Seabird ECO55 rosette sampler, decanted into sample bottles and preserved for analysis of metals, various conventional parameters and nutrients (Appendix C1). Bacteriological indicators, ammonia, hardness, metals, total suspended solids and pH samples were analysed for each of the "5-in-30" sampling events. Additional analyses including oil and grease, phosphorus, sulphide and total organic carbon were carried out for samples collected on only one day per quarter (usually the first of the "5-in-30" sets).

The surface and IDZ water column samples were analysed for two bacteriological indicators (fecal coliforms and enterococci) by BV Labs (Victoria, BC).

Bacteriological results were evaluated against water quality guidelines BC ENV (2025a; 2025b) for recreational primary contact (for informational purposes only) and to Health Canada (2012) guidelines for recreational water quality. The Health Canada guidelines for enterococci are:

- The geometric mean of 5 samples collected in 30 days should not exceed 35 CFU/100 mL.
- Single enterococci values should not exceed 70 CFU/100 mL.

All other IDZ water column results were evaluated against approved BC Water Quality Guidelines for the Protection of Aquatic Life (BC ENV 2025a; 2025b).

Model Validation

The registration under the Municipal Wastewater Regulation (MWR), Authorization #RE108831, requires plume dispersion and dilution modelling using concurrent effluent and receiving environment water quality samples at the edge of the IDZ at McLoughlin Point outfall, far-field sites (Haystock Islets, Ogden Point, Cook Street, Chatham and Discovery Islands, Trial Island) and at Clover (CPS) and Macaulay pump stations (MPS) during potential overflow events, for modelled scenarios 1, 2 and 3 (Lorax, 2019). Station locations are provided in Figure 3.2.

The three modelled scenarios are based on the influent flow hydrographs prepared by Lorax (2019) representing typical conditions expected up to the year 2030.

- Scenario 1 represents summer conditions with flows of about 80% of the average dry weather flow (ADWF) for MPWWTP (ADWF of 108,000 m3/day) of tertiary-treated effluent.
- Scenario 2 represents wet weather conditions providing discharge through only the MPWWTP outfall (flows 0.5 x to 2.9 x ADWF when MPWWTP is discharging primary + tertiary blended effluent).
- Scenario 3 represents wet weather storm conditions (flows >4 x ADWF) providing discharge through both the MPWWTP (primary + tertiary blended effluent) and CPS (screened effluent) deep outfalls.

Figure 3.1 Surface and IDZ Sampling Locations

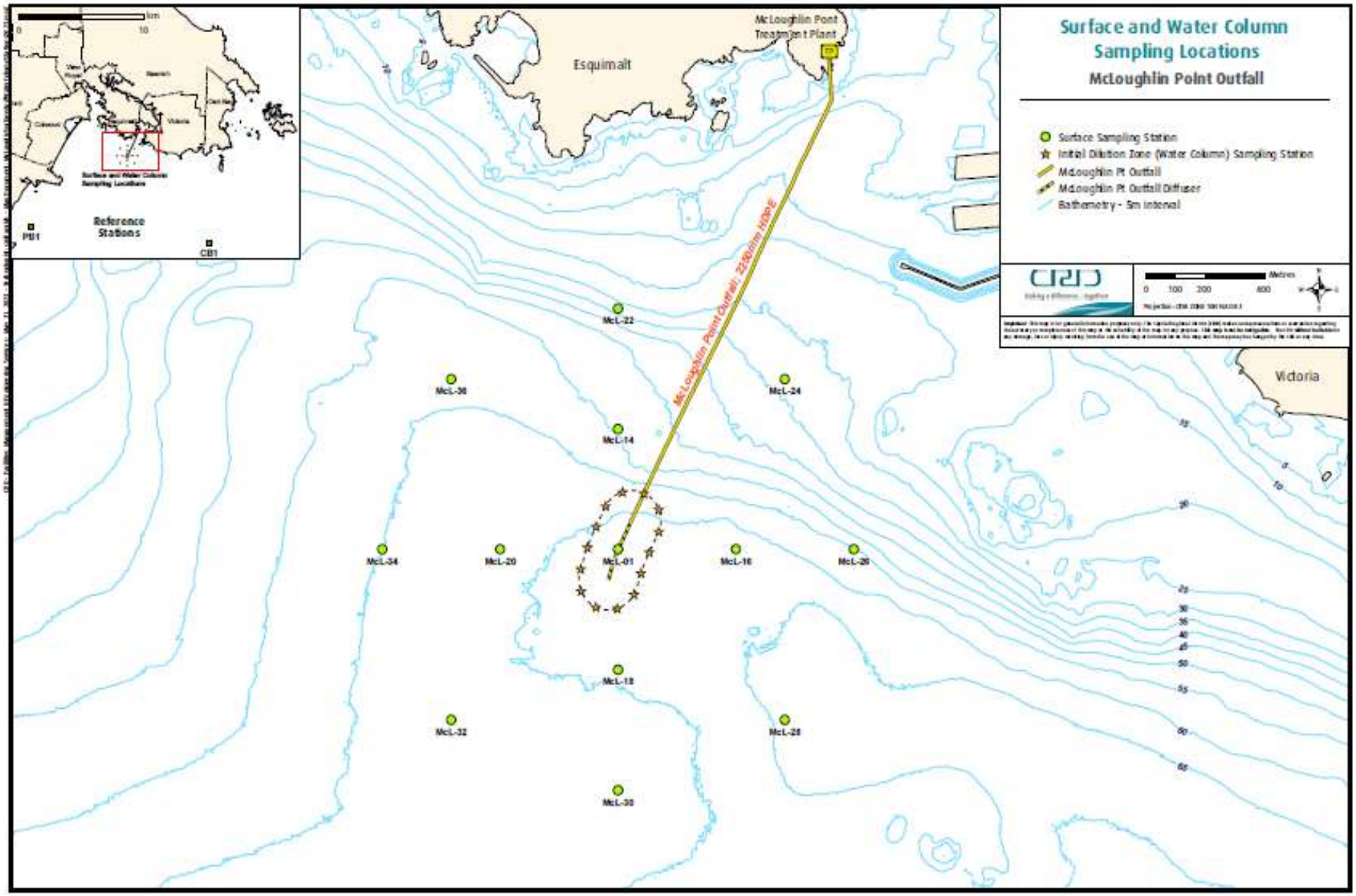
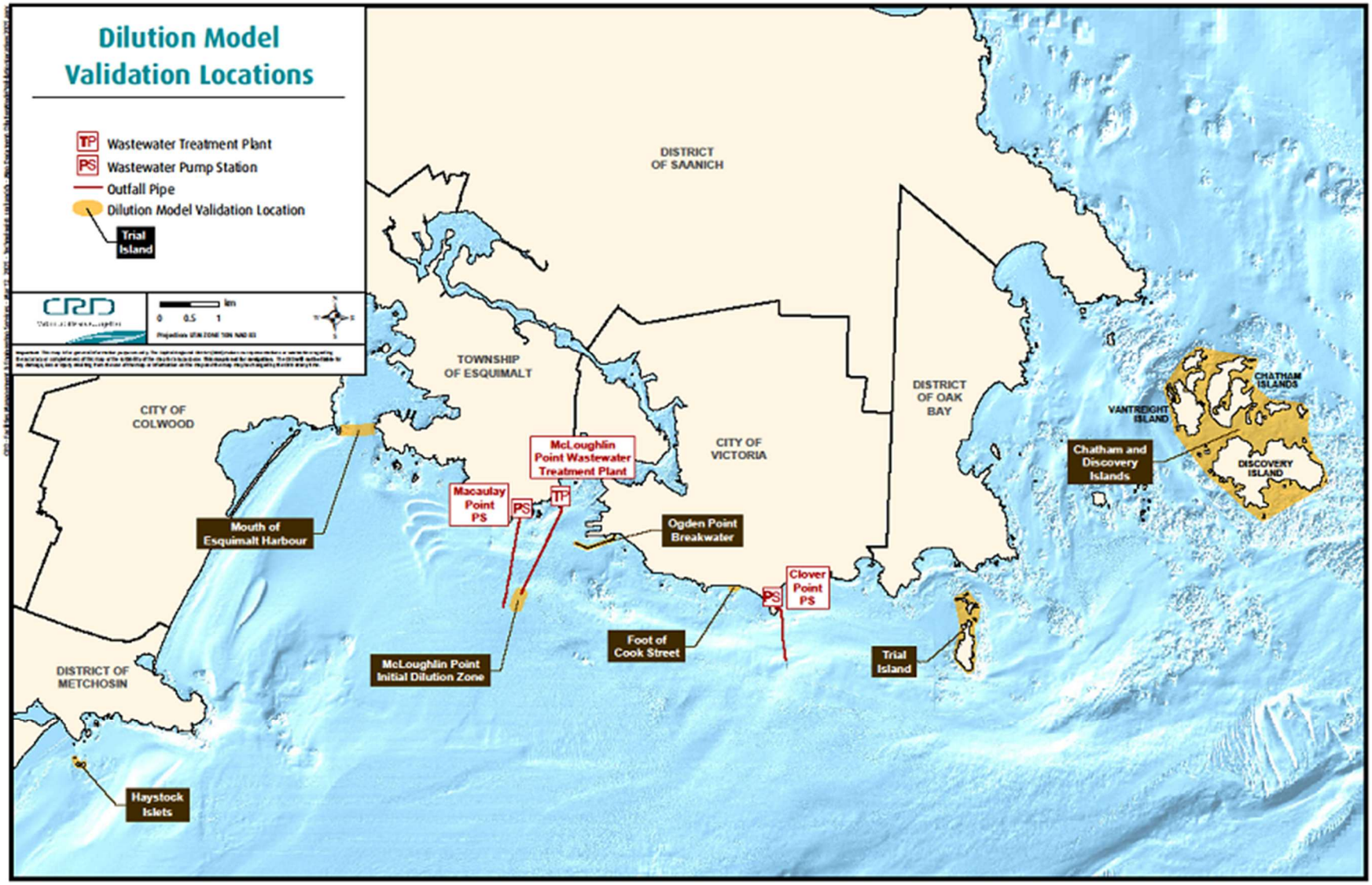


Figure 3.2 Dilution Validation Model Locations



3.3 Results and Discussion

3.3.1 Surface Water Sampling

Water samples were collected at the IDZ, receiving environment, and reference stations at surface and at depth during quarterly 5-in-30 sampling events. These bacteriological and water chemistry samples provide information about the risk to human health and the environment both at the IDZ and in the receiving environment.

Events that affected the 2025 surface water sampling program included several weather-related sampling omissions and the planned treatment bypass. Samples were collected as required for each quarterly event except for the fifth winter event (all stations), and the first summer event (Reference Constance Bank). These samples were not collected due to adverse unsafe weather conditions. In addition, the first three of the five spring events (April 3, April 9, and April 15) were expected to reflect higher bacteriological and water chemistry concentrations associated with the authorized secondary and tertiary treatment bypass that occurred between March 26 and April 14.

Fecal coliform results for each sampling event (including seasonal geometric means) are presented in Appendix C3. Seasonal geometric means by station were one to two orders of magnitude below the provincial guideline of 200 CFU/100 mL. The only elevated fecal coliform concentrations measured in 2025 were 3,300 CFU/100 mL at McL-01 and 460 CFU/100 mL at McL 20 during the Spring set. These elevated results were both recorded for the April 15 sampling event within one day of the end of the authorized treatment bypass.

Enterococci results for each sampling event (including seasonal station geometric means) are presented in Appendix C4. All seasonal geometric means were below the federal guideline of a geometric mean of 35 CFU/100 mL. Two enterococci measurements were above the federal single value guideline of 70 CFU/100 mL with 1,000 CFU/100 mL at McL-01 and 71 CFU/100 mL at McL-20 during the Spring set. These elevated results were both recorded for the April 15 sampling event within one day of the end of the authorized treatment bypass.

The frequency of exceedances associated with McLoughlin is now much less than was observed historically at the Clover and Macaulay receiving environment monitoring stations (CRD, 2020). Surface water sampling results indicate that treatment has greatly reduced bacterial concentrations in effluent by up to two orders of magnitude. Subsequently, the surface water results in the receiving environment show lower concentrations of bacteria when plume surfacing occurs (CRD, 2021-2022). Elevated bacteriological concentrations were only observed during the spring sampling set and were expected to occur in association with the authorized treatment bypass.

The 2025 results indicate that the McLoughlin WWTP effluent plume was mostly trapped below the surface, as predicted by the CRD's hydrodynamic C3 model. Therefore, the outfall diffuser contributed to adequate dilution. Had the effluent plume not been predominantly trapped, more frequent high fecal coliform and enterococci concentrations would have been observed, particularly at stations approximately 100 m from the outfall, where the model predicts the plume is most likely to surface (Hodgins, 2006).

3.3.2 Initial Dilution Zone Water Column Sampling

Analytical results for each round of IDZ water column sampling for select parameters are presented in Appendices C5-C16. CTD and dissolved oxygen plots for each sampling event are available upon request.

Bacteriological Results

The 5-in-30 water column fecal coliform geometric mean results did not exceed guidelines during any season (historical guideline) (Appendix C5).

The 5-in-30 water column enterococci geometric mean results were in exceedance of the 35 CFU/100 mL guideline for the middle and bottom Station 1, 2, and 3 Spring set samples. The federal maximum single

Enterococci guideline of 70 CFU/100 mL was exceeded for 20 of the 60 samples collected for the Spring set (Appendix C6). These exceedances occurred during the authorized bypass between March 26 and April 14. Elevated bacteriological results were expected due to higher concentrations in the discharged effluent.

Metals, Metalloids and Nutrients

Cadmium 5-in-30 average concentrations exceeded the BC long-term chronic (LTC) guideline of 0.12 µg/L for the summer set at Station 2 Middle (0.19 µg/L) and for the autumn set at Station 1 Bottom (0.13 µg/L), Station 2 Top (0.19 µg/L), Station 3 Top (0.12 µg/L) and Reference Constance Bank Bottom (0.15 µg/L) (Appendix C11). Elevated cadmium concentrations continue to be observed sporadically since 2023.

Copper 5-in-30 average concentrations exceeded the BC LTC guideline of 2 µg/L for the winter set at Station 2 Middle (4.5 µg/L) and for the summer set at Station 4 Middle (14 µg/L), Reference Parry Bay Top (4.2 µg/L) and Bottom (4.2 µg/L), and Reference Constance Bank Top (4.7 µg/L). Copper concentrations exceeded the BC short-term acute (STA) guideline of 3 µg/L for three winter samples (Station 2), four summer IDZ samples, and five summer reference samples.

Lead concentrations were reported under the 140 µg/L STA guideline and 5 µg/L LTC guideline for all IDZ and reference station samples for 2025 (Appendix C13).

Nickel 5-in-30 average concentrations exceeded the BC LTC guideline of 8.3 µg/L for the summer quarterly Station 2 Top (9.10 µg/L) and Station 4 Top (12.7 µg/L) sets.

Zinc 5-in-30 average concentrations exceeded the BC LTC guideline of 10 µg/L during all 2025 quarterly events (Appendix C16):

- Winter set: Station 1 Bottom (15.0 µg/L), Station 2 Top (19.5 µg/L) and Middle (11.6 µg/L).
- Spring set: Station 1 Middle (11.26 µg/L) and Bottom (19.14 µg/L), Station 2 Top (10.24 µg/L) and Middle (18.78 µg/L), Reference Parry Bay Middle (12.94 µg/L).
- Summer set: Station 3 Bottom (24.60 µg/L), Station 4 Top (10.52 µg/L) and Bottom (13.80 µg/L), Reference Constance Bank Top (18.33 µg/L), Middle (64.60 µg/L), and Bottom (36.80 µg/L).
- Autumn set: Station 1 Bottom (29.4 µg/L), Station 3 Top (23.0 µg/L).

The zinc BC STA guideline of 55 µg/L was also exceeded for one winter sample at Station 2 Top (68.9 µg/L), two spring samples at Station 1 Bottom (83.7 µg/L) and Station 2 Middle (81.9 µg/L), four summer samples at Station 3 Bottom (106 µg/L), Reference Constance Bank Top (61.1 µg/L), Middle (242 µg/L), and Bottom (123 µg/L), and two autumn samples at Station 1 Bottom (135 µg/L), and Station 3 Top (103 µg/L) (Appendix C16).

Concentrations of total boron exceeded the provincial LTC guideline of 1,200 µg/L in all samples, with values ranging from 3,490 µg/L to 5,500 µg/L for 2025 (Appendix C10). Background boron concentrations, as demonstrated at the reference stations, are approximately 4,000 µg/L in southern Vancouver Island marine waters (BCMoE, 2006). In the context of the reference station and regional background concentrations, these exceedances are expected.

Total ammonia as nitrogen concentrations were well below the selected site-specific provincial marine WQG of 1.1 mg/L. The maximum concentration observed was 0.17 mg/L with most results below 0.05 mg/L.

Arsenic, silver, and manganese concentrations were below BC WQGs throughout 2025.

The 2025 results reflect an improvement of IDZ water quality since wastewater treatment was implemented. Prior to wastewater treatment, bacteriological results at middle and bottom depths showed consistent guideline exceedances (CRD, 2020). The treatment process has reduced the concentration of bacterial indicators, metals, and nutrients in the water column as well as on the water surface by up to an order of magnitude or more. The marine sample results for 2025 reflect the modelled 113:1 IDZ dilution factor when compared to the MPWWTP final effluent concentrations. Water chemistry concentrations remained

generally consistent across quarters, suggesting that the authorized bypass had minimal to no effect on these parameters.

Water Column Profiles

Water column profiles of temperature, salinity and dissolved oxygen (Appendix C17) generally followed expected seasonal patterns for the Strait of Juan de Fuca (well mixed in winter and stratified in summer). The plume was only occasionally detected by the CTD sensors in 2025, as expected, due to rapid mixing in the IDZ. A master's thesis (Krogh *et al*., 2018) examining vertical profiles of dissolved oxygen between 2011 and 2016 confirmed that of the approximately 850 CTD casts conducted in the IDZ, only six profiles showed any evidence of a sewage plume layer, using decreases in dissolved oxygen as the primary indicator. This study confirms that bacteria concentrations are a reliable indicator of sewage plume, and they will continue as the main monitoring tool for plume detection.

CTD profiling will continue as part of the routine Environmental Monitoring Program. The data will be regularly fed into the oceanographic plume dispersion and dilution modelling to maintain an up-to-date database of background conditions.

3.3.3 Dilution Model Validation

The MPWWTP operated under a temporary bypass from March 26 to April 14, 2025 to facilitate cleaning and maintenance. Full treatment functionality was restored on April 14, with effluent quality returning to normal over the following days. As part of its commitment to ENV, the CRD conducted environmental monitoring before the bypass, twice during the bypass period, and once after completion. Following consultation with the Songhees First Nation, an additional monitoring location was added at the mouth of Esquimalt Harbour. The model validation results are evaluated in the context of the MPWWTP bypass in Appendix F.

The pre- and post- bypass results (Table 3.1, Table 3.4) reflect model Scenario 1, and the during bypass results (Table 3.2, Table 3.3) reflect model Scenario 2.

Table 3.1 Model Validation Far-field Surface Water Sampling Results March 17, 2025 (pre-bypass); ebb tide

		Bacteria (CFU/100mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	Depth (m)	Enterococci	Fecal Coliform	Human	Gull	Canada Goose	Dog
Haystock Islets	1	<1	1	ND	ND	ND	ND
	30	1	2	---	---	---	---
Esquimalt Harbour	1	<1	1	220	8.4	ND	ND
	15	5	15	---	---	---	---
Ogden Point Breakwater	1	6	18	250	1.9	ND	ND
	26	4	9	---	---	---	---
Foot of Cook Street	1	<1	3	180	4.2	ND	ND
	16	3	2	---	---	---	---
Trial Island	1	1	2	6.7	ND	ND	ND
	17	<1	1	---	---	---	---
Chatham Island	1	<1	1	ND	2.1	ND	ND
	29	<1	1	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected
--- not sampled

Table 3.2 Model Validation Far-field Surface Water Sampling Results March 31, 2025 (during bypass); ebb tide

		Bacteria (CFU/100mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	Depth (m)	Enterococci	Fecal Coliform	Human	Gull	Canada Goose	Dog
Haystock Islets	1	2	3	650	48	ND	28
	27	1	7	---	---	---	---
Esquimalt Harbour	1	3	4	1,800	1.3	ND	1.8
	15	4	15	---	---	---	---
Ogden Point Breakwater	1	31	47	13,000	5.0	ND	4.2
	25	32	31	---	---	---	---
Foot of Cook Street	1	23	36	2,800	ND	ND	1.5
	16	28	43	---	---	---	---
Trial Island	1	31	39	9,400	6.2	ND	2.7
	24	58	47	---	---	---	---
Chatham Island	1	<1	4	310	3.6	ND	ND
	30	2	5	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected
--- not sampled

Table 3.3 Model Validation Far-field Surface Water Sampling Results April 14, 2025 (during bypass); ebb tide

		Bacteria (CFU/100mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	Depth (m)	Enterococci	Fecal Coliform	Human	Gull	Canada Goose	Dog
Haystock Islets	1	10	10	4,700	<0.23	<0.23	0.28
	26	16	19	---	---	---	---
Esquimalt Harbour	1	3	2	630	7.40	<0.23	0.12(J)
	14	32	39	---	---	---	---
Ogden Point Breakwater	1	9	11	8,100	35	<0.23	0.74
	27	34	50	---	---	---	---
Foot of Cook Street	1	5	6	850	<0.2	<0.24	0.12(J)
	15	7	14	---	---	---	---
Trial Island	1	8	12	4,000	84	<.26	0.33
	17	17	15	---	---	---	---
Chatham Island	1	<1	<1	18	42	<0.24	<0.24
	21	<1	3	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected
--- not sampled

Table 3.4 Model Validation Far-field Surface Water Sampling Results April 23, 2025 (after bypass); slack tide

		Bacteria (CFU/100mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	Depth (m)	Enterococci	Fecal Coliform	Human	Gull	Canada Goose	Dog
Haystock Islets	1	1	4	180	24	24	24
	29	3	1	---	---	---	---
Esquimalt Harbour	1	1	<1	31	<0.25	<0.25	<0.25
	15	11	22	---	---	---	---
Ogden Point Breakwater	1	2	22	120	1.00	24	24
	26	20	32	---	---	---	---
Foot of Cook Street	1	7	9	590	<0.25	<0.25	<0.25
	15	15	32	---	---	---	---
Trial Island	1	10	28	1,400	4.60	<0.27	0.43
	22	21	36	---	---	---	---
Chatham Island	1	2	<1	24	<0.24	<0.24	<0.24
	21	3	1	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected
--- not sampled

3.3.4 Overall Assessment

The 2025 surface fecal coliform and enterococci results indicate that the commissioning of the McLoughlin WWTP has reduced impacts to the receiving environment. The treated effluent plume was trapped well below the marine surface, and the diffusers were effectively diluting the effluent. There were no surface depth enterococci exceedances for any of the sampling sets of the 35 CFU/100 mL geomean-based federal standard. Two enterococci values collected during the spring set exceeded federal maximum single enterococci guidelines of 70 CFU/100 mL due to the authorized treatment bypass. Receiving environment concentrations consistently reflect the expected 113:1 dilution factor when compared to MPWWTP final effluent concentrations.

Regulatory exceedances were observed for IDZ samples for boron, cadmium, copper, nickel, and zinc. The number of parameters and frequency of WQG exceedances was similar to previous years; with the exception of lead which was no longer in exceedance. Elevated metals concentrations have been observed in water column samples across a variety of stations in both 2024 and 2025. No notable trend was observed for these parameters in relation to the authorized treatment bypass. The cause of these heterogenous results is uncertain but the trend will continue to be monitored.

Ongoing nutrient monitoring indicates there is negligible risk of eutrophication in the receiving environment due to MPWWTP discharges. Nutrient concentrations remained well below applicable marine water quality guidelines and were comparable to reference station concentrations. Elevated background nutrient levels in the Salish Sea are common and are largely attributable to inputs from the Fraser River.

In summary, the new McLoughlin WWTP treatment processes have substantively reduced potential impacts to human health and the marine receiving environment, particularly from a bacteriological perspective, relative to the historical Macaulay and Clover discharges.

4.0 OVERFLOW AND BYPASS MONITORING

4.1 Introduction

During high volume storm events, the input to the Core Area conveyance system (Figure 1.1) may exceed system capacity, resulting in overflows at combined sewer overflow (CSO) and sanitary sewer overflow (SSO) relief points. There are also periodic bypass events to allow for planned maintenance of the treatment works or following unexpected non-routine or emergency events. CRD staff carry out monitoring based on the total discharge volume, location, and season to ensure the protection of human health.

There are multiple overflow relief points in the system (Table 4.2); however, most are never used outside of emergencies. the frequency of overflows has decreased following recent conveyance system upgrades. The historical and predicted future overflow frequencies for overflow relief points are presented in Table 4.1.

The McLoughlin Wastewater Treatment Plant, and the conveyance system upgrades, have reduced the frequency of overflows from most SSO points. These additions include the 5,000 m^3 underground Arbutus Attenuation Tank, that temporarily stores wastewater flows during high volume storm events, and moderates release into the downstream system. The frequency of overflows at the Humber and Rutland CSO locations, however, will remain unchanged until the District of Oak Bay completes separation of wastewater and stormwater systems in the Uplands neighbourhood. Additionally, the Marigold holding tank was constructed in 2004 to attenuate flows on the west side of the conveyance system.

In the event of an overflow or bypass, sampling may be required at adjacent beaches and/or stormwater outfalls. Protocols were developed in consultation with Island Health and approved by ENV. The purpose of shoreline monitoring is to assess risk for people engaged in recreational activities on beaches adjacent to the overflows by comparing bacterial results to recreational guidelines (Health Canada 2012 and 2024).

During the spring and summer (May 1 to September 14), the CRD monitors overflow events, if any occur. Monitoring occurs both during and after overflow events, if possible and safe. CRD staff post temporary beach advisory signs and contact Emergency Management BC (EMBC) and Island Health.

The monitoring and advisory response varies during the remainder of the year (September 15 to April 30). For the Humber and Rutland CSO locations, permanent signage has been posted at all potentially affected beaches advising beach users to stay out of the water for 48 hours after any weather event, and no sampling is undertaken for routine wet weather overflows. For the remaining SSO locations, and any unexpected non-routine or emergency CSO discharges, CRD staff conduct shoreline monitoring.

In the event of a planned or unplanned bypass at the McLoughlin WWTP, the CRD notifies ENV and analyzes the effluent composite sample.

Table 4.1 Overflow Frequency Pre- and Post-Treatment Plant/Conveyance System Upgrade

Location	Pre Upgrade	Post Upgrade
Finnerty	3-4 times/year	>25-year frequency storm
Humber	7-10 times/year	7-10 times/year
Rutland	7-10 times/year	7-10 times/year
McMicking	3-4 times/year	>25-year frequency storm
Clover Long Outfall	continuous	61 hours/year
Clover Short Outfall	3-4 times/year	>100-year frequency storm
Macaulay Long Outfall	continuous	>10-year frequency storm
Macaulay Short Outfall	1-2 times/decade	>100-year frequency storm
McLoughlin	n/a	Planned or unplanned bypass due to maintenance, equipment malfunctions or high flow.

4.2 Methods

A network of shoreline and stormwater sampling stations cover the beach area around the CSO/SSO locations (Table 4.2, Appendix D1). Shoreline stations are named based on their proximity to the overflow/relief point in the conveyance system, (e.g., HUM-H for Humber H). Storm drains are numbered, with stormwater stations named using that number in combination with “SW”.

When sampling is required, CRD staff select sampling stations based on the location of the overflow/bypass event(s) (Appendix D1) and collect a sample approximately 48 hours after the event occurs. Samples are collected concurrently at adjacent stormwater discharges.

For the planned bypass from March 26 through April 14, 2025 (Appendix F), surface water sampling was conducted from the CRD’s 18-foot aluminum sampling vessel. Samples were collected at a depth of 1 m using an extendable sampling pole at designated McLoughlin Point WWTP receiving-environment stations and at five to six far-field monitoring locations. All surface water samples were analyzed for fecal coliforms and enterococci. In addition, samples collected at the far-field stations were analyzed using DNA-based bacterial source tracking (BST), a technique used to identify whether fecal contamination originated from human or non-human sources (e.g., dogs or birds). Fecal coliform and enterococci concentrations were also measured in samples collected at maximum depth during the 2025 monitoring program.

Staff collect samples by submerging a sterile 500 mL plastic bottle into the marine surface waters as far as the sampling technician can reach from the shoreline, or by holding the bottle in the stormwater discharge flow. Samples are sent to Bureau Veritas (Burnaby, BC) for analysis for enterococci. Results are compared to Health Canada (2012) guideline limit of 70 CFU/100 mL for a single sample. BST analyses were conducted by Microbial Insights (Knoxville, Tennessee).

Table 4.2 Sanitary Sewer Overflow and Combined Sewer Overflow Locations

Outfall	Discharge Site	Location		Treatment Equipment	Diffusers	Discharge Type
		Latitude	Longitude			
Clover Point Pump Station Long Outfall	Marine Outfall	48.394	-123.346	Travelling Panel Screen	Yes	Screened overflows
Humber Pump Station	Marine Outfall	48.449	-123.291	Bar Screen	N/A	Screened overflows
Rutland Pump Station	Marine Outfall	48.441	-123.291	Bar Screen	N/A	Screened overflows
Arbutus Trunk at Finnerty Cove	Marine Outfall	48.473	-123.286	N/A	N/A	Unscreened
Currie Major Pump Station (through McMicking Outfall)	Marine Outfall	48.409	-123.306	Travelling Bar Screen	N/A	Screened and unscreened
Currie Minor Pump Station (through McMicking Outfall)	Marine Outfall	48.409	-123.306	N/A	N/A	Unscreened
Penrhyn Minor Pump Station	Local Storm Sewer	48.459	-123.292	N/A	N/A	Unscreened
Hood Pump Station (through McMicking Outfall)	Marine Outfall	48.409	-123.306	N/A	N/A	Unscreened
East Coast Interceptor at Broom	Local Storm Sewer (Marine Discharge)	48.428	-123.307	N/A	N/A	Unscreened
Bowker Trunk to Bowker Creek at Monterey Avenue	Creek/River	48.429	-123.314	N/A	N/A	Unscreened
Northeast Trunk-B at Broom	Local Storm Sewer (Marine Discharge)	48.428	-123.308	N/A	N/A	Unscreened
Harling Pump Station	Local Storm Sewer (Marine Discharge)	48.407	-123.324	N/A	N/A	Unscreened
Clover Point Pump Station Emergency Bypass Outfall	Marine Outfall	48.404	-123.348	Travelling Panel Screen	N/A	Can be screened and unscreened
Clover Point Pump Station Short Outfall	Marine Outfall	48.402	-123.347	Travelling Panel Screen	N/A	Can be screened and unscreened
Macaulay Point Pump Station Long Outfall	Marine Outfall	48.403	-123.411	Travelling Panel Screen	Yes	Screened overflows
Macaulay Point Pump Station Short Outfall	Marine Outfall	48.416	-123.407	Travelling Panel Screen	N/A	Can be screened and unscreened
Head Street Northwest	Local Storm Sewer	48.427	-123.399	N/A	N/A	Unscreened
Sea Terrace Northwest Trunk	Local Storm Sewer	48.431	-123.394	N/A	N/A	Unscreened
Harriet Siphon Northwest Trunk to Gorge	Marine Outfall	48.443	-123.392	N/A	N/A	Unscreened
Gorge Siphon to Gorge	Marine Outfall	48.440	-123.388	N/A	N/A	Unscreened
Craigflower Pump Station at manhole S0560 on Shoreline Trunk	Marine Outfall	48.453	-123.425	N/A	N/A	Unscreened
Langcove Pump Station	Local Storm Sewer	48.433	-123.419	N/A	N/A	Unscreened
Marigold Pump Station to local storm sewer and into Colquitz Creek	Creek/River	48.468	-123.399	N/A	N/A	Unscreened

4.3 Results and Discussion

In addition to the planned bypass from March 26 through April 14, 2025 (Appendix F), there were 31 overflow and unplanned bypass events in 2025, as listed in Table 4.3. Based on time of year and overflow location, shoreline sampling was conducted; these results are reported in Table 4.4.

Shoreline sampling results exceeded the BC Recreational Water Quality Guidelines for enterococci at Humber, McMicking, Craigflower, and Bowker (Table 4.4). While shoreline sampling is not typically required during winter, this response was triggered by the large volumes spilt at multiple locations. Subsequent shoreline sampling was not carried out because the overflows ceased one week prior to the sampling event and, as a result, were not expected to be impacting the current shoreline bacterial counts. The elevated bacterial results observed on December 17, 2025 were likely related to stormwater inputs from heavy rains on December 16, 2025.

Table 4.3 2025 Core Area Overflow and Bypass Events

Date	Location	DGIR Number	Type of Event	Sampling
2025-02-26	McLoughlin	250773	Equipment failure	None
2025-03-21	Rutland PS	251153	Storm event	None
2025-03-23	Rutland PS	251176	Storm event	None
2025-03-26	Rutland PS	251235	Storm event	None
2025-03-23	Clover PS	251177	Storm event	None
2025-03-24	Clover PS	251185	Storm event	None
2025-03-26	Clover PS	251238	Storm event	None
2025-08-14	Clover PS	253175	Equipment failure	None
2025-10-28	Rutland PS	254156	Storm event	None
2025-11-01	Rutland PS	254207	Storm event	None
2025-11-01	Clover PS	254208	Storm event	None
2025-11-06	Rutland PS	254285	Storm event	None
2025-12-08	Clover PS	254715	Storm event	None
2025-12-09	Clover PS	254732	Storm event	None
2025-12-10	McMicking PS	254739	Storm event	Shoreline samples
2025-12-10	Rutland PS	254740	Storm event	Shoreline samples
2025-12-10	Humber	254765	Storm event	Shoreline samples
2025-12-10	Harling	254766	Storm event	None
2025-12-10	Arbutus PS	254767	Storm event	Shoreline samples
2025-12-10	1660 Monterey Ave	254768	Storm event	Shoreline samples; Bower Creek samples
2025-12-10	Craigflower PS	254769	Storm event	Shoreline samples
2025-12-11	McLoughlin	254779	Equipment failure	Effluent sample
2025-12-15	Rutland PS	254835	Storm event	None
2025-12-15	Clover PS	254866	Storm event	None
2025-12-16	Humber PS	254985	Storm event	Shoreline samples
2025-12-16	McMicking PS	254896	Storm event	Shoreline samples
2025-12-16	Rutland PS	254872	Storm event	Shoreline samples
2025-12-16	Harling PS	254897	Storm event	None
2025-12-16	Arbutus PS	254894	Storm event	Shoreline samples
2025-12-16	Clover PS	254871	Storm event	Shoreline samples; effluent sample
2025-12-20	Clover PS	254972	Storm event	None

Notes:
DGIR – Dangerous Goods Incident Report

Table 4.4 2025 Core Area Overflow and Bypass Sampling Event Results

				Enterococci (CFU/100 mL)	
Overflow Location(s)	**Related DGIR Number**	**Sampling Date**	**n**	**Geomean**	**Maximum**
Humber	254765; 254872; 254740; 254835; 254985	2025-12-17	10	**62**	**170**
McMicking	254739; 254896	2025-12-17	3	**44***	**75**
Finnerty	254767; 254894	2025-12-17	5	14	39
Craigflower	254769	2025-12-17	7	**690**	**1,000**
Bowker	254768	2025-12-17	7	**517**	**2,500**

Formatting indicates exceedances as follows:
≤ 35 enterococci / 100 mL; geometric mean concentration (minimum five samples)
≤ 70 enterococci / 100 mL; single sample maximum concentration
≤ 200 E. coli / 100 mL; geometric mean concentration (minimum five samples)
≤ 400 E. coli / 100 mL; single sample maximum concentration
Notes:
Geomean – geometric mean
* – only three samples were collected which is less than the minimum five samples required to calculate a geometric mean

There were 10 overflow events at Clover Pump Station in 2025. Samples were collected for TSS, CBOD, and bacteriological parameters using an automated sampler on a time-based collection program. The sampler was only successful at collecting overflow samples on December 18, 2025 in response to the spills associated with DGIR numbers 254866 and 254871. The bacteriological results reflected typical concentrations for storm event overflow wastewater; the TSS and CBOD results were both below the federal limits of 130 mg/L (Table 4.5). Equipment and control software malfunctions resulted in no samples collected for the Clover Pump Station overflow events earlier in the year. Samples were not collected on for DGIR 254972 because of the December 18 samples collected within 48 hours of this event were considered representative.

Table 4.5 2025 Core Area Overflow and Bypass Sampling Event Results

Overflow Location(s)	Related DGIR Number	Sampling Date	TSS (mg/L)	CBOD (mg/L)	Enterococci (CFU/100 mL)	Fecal coliforms (CFU/100 mL)
Clover PS	251177	2025-03-23	---	---	---	---
Clover PS	251185	2025-03-24	---	---	---	---
Clover PS	251238	2025-03-26	---	---	---	---
Clover PS	253175	2025-08-14	---	---	---	---
Clover PS	254208	2025-11-01	---	---	---	---
Clover PS	254715	2025-12-08	---	---	---	---
Clover PS	254732	2025-12-09	---	---	---	---
Clover PS	254866; 254871	2025-12-15; 2025-12-18	59	44	1,100	1,700
Clover PS	254972	NA	---	---	---	---

Notes: --- not sampled

4.4 McLoughlin Authorized Bypass March 26 to April 14

The CRD obtained approval from ECCC and ENV for a temporary bypass of secondary and tertiary treatment processes at McLoughlin to allow essential maintenance and cleaning of the dirty backwash tank. The bypass lasted 20 days, from March 26 to April 14, 2025, during which time wastewater continued to receive all other available treatment and was discharged through the plant's long outfall. The post-bypass report is provided in Appendix F.

4.4.1 Methods

During the bypass, effluent flows at McLoughlin were continuously monitored through the plant's SCADA system, with daily flow volumes tracked and compared against the federal authorization limit of 2,761,500 m^3. Final effluent quality was assessed using 24-hour flow-based composite samples collected in accordance with provincial and federal requirements and analyzed by two CALA-certified laboratories, Bureau Veritas Laboratories and the CRD laboratory. Results were evaluated against the bypass authorization limits for CBOD and TSS, as well as the routine discharge standards established under the Municipal Wastewater Regulation and Wastewater Systems Effluent Regulations. In addition, routine final effluent toxicity testing using rainbow trout and *Daphnia magna* was conducted before and after the bypass by Nautilus Environmental. No toxicity testing was required or performed during the bypass itself. Detailed methods are provided in Appendix F.

4.4.2 Results and Discussion

Both the volume and quality of bypass flows discharged met the limits authorized by federal and provincial regulators. Effluent quality improved rapidly after completion of the bypass when secondary and tertiary treatment processes were restored on April 14, 2025.

Effluent discharged during the bypass remained well below the surface of the marine receiving environment based on bacteriological results collected at multiple depths. Two enterococci measurements exceeded the federal single value guideline of 70 CFU/100 mL on April 15, one day after the end of the bypass. No exceedances of primary contact recreational guidelines were observed at any of the far-field surface monitoring sites; however, some shellfish harvesting-based guidelines were exceeded. These results were all within the sanitary shellfish harvesting closure area 19.1. No shellfish harvesting guideline exceedances were observed at Tl'ches (Chatham/Discovery Islands) during the bypass.

Water quality guidelines for the protection of marine aquatic organisms were exceeded for boron and zinc. These exceedances were unrelated to the bypass and were similar to concentrations measured during the routine outfall monitoring program.

Detailed results and interpretation are provided in Appendix F.

4.5 Overall Assessment

Previous overflow and bypass sampling conducted in the Core Area has reaffirmed that the wastewater signal in the vicinity of the overflow or bypass has generally dissipated by 48 hours following the events, therefore the risk to humans recreating on nearby beaches is highest in the immediate 48 hours after rain events. Effluent flows from the MPWWTP were non-detectable at far-field monitoring stations. Overflow and bypass samples will continue to be conducted as required in 2026.

5.0 SEAFLOOR MONITORING

Seafloor monitoring is conducted every two to three years around the McLoughlin and Macaulay outfalls and every five years around the Clover Point outfall. In 2025, finfish and crab were assessed at McLoughlin, Macaulay and Clover; sediment chemistry, sediment toxicity, and horse mussels (bivalves) were assessed at Clover Point. These investigations were carried out to assess the impacts of wastewater discharges to human health and the environment through sediment and seafloor-related exposure pathways.

5.1 Methods

Crab and Finfish

The finfish and crab health survey is a key component of the WMEP and is conducted once during each monitoring cycle at McLoughlin Point and Clover Point (exposure locations) and at Sidney Island (reference location).

The study involved:

- Trawling and collection of finfish and crab samples.
- Assessment of finfish and crab health through multiple biological indicators.
- Analysis of tissue chemistry to measure contaminant concentrations (bioaccumulation).
- Integration of the study findings into human health and ecological risk assessments.

The monitoring program was carried out by Hatfield Consulting at three locations: two exposure areas situated near the McLoughlin and Clover Point outfalls, and a far-field reference area near Sidney Island. Sampling was completed during three seasonal surveys in 2025: spring (April 29 to May 6), summer (July 22), and fall (September 16 to 20).

Finfish and crabs were collected using beam trawls during three seasonal sampling periods in 2025: an eight-day spring survey (April to May), a one-day summer survey (July), and a five-day fall survey (September). Sampling was conducted from a 30 m vessel using a beam trawl equipped with a 3 m beam and a 10 m net. Each trawl was carried out for approximately 20 to 30 minutes along straight transects at a consistent speed of 1 to 4 knots.

Following each trawl, target fish and crab species were identified, counted, and transferred to covered holding tanks supplied with circulating seawater and aeration.

Organisms were measured for body size and condition, then dissected and sent to commercial laboratories for the following:

- Liver tissue for induction of mixed functional oxidase activity;
- Muscle and liver tissue for contaminants analyses;
- Otoliths (x2) for ageing; and
- Tissues for histological and metabolite concentration analyses, following the procedures required by the sub-consulting laboratory.

Sediment Chemistry

Sediment samples were collected between September 2 through September 11, 2025 from 14 stations:

- 10 near-/mid-/far-field stations around Clover Point
- 3 reference stations at Constance Bank
- 1 reference station at Finnerty Cove

Three replicate Van Veen grabs were collected at each station and composited into one sample representing each station using methods consistent with previous monitoring years (collecting sediments only from the top 2 cm of each grab). Additional sediment was collected at stations for use in the toxicity and bioaccumulation tests, as the volume requirements for these tests were significant.

The sediment composite samples were analyzed for routine parameters and by BV Laboratories (Burnaby, BC) and for high resolution parameters by SGS AXYS Analytical Services Ltd. (Sidney BC). Ten percent of the sediment samples were randomly chosen for additional laboratory and field triplicate analyses. The analytical laboratories also conducted internal QA/QC analyses, including method analyte spikes, method blanks and standard reference materials.

Bivalve Survey

Horse mussels (50 mm minimum size) were collected from each of the 14 Clover Point monitoring stations using a Van Veen grab. Mussel samples were collected concurrently with the sediment samples. Field duplicate samples were collected at approximately 10% of stations. A total of 25 mussels were collected from each station, of which 15 individuals were composited for tissue chemistry analysis. The remaining 10 mussels were assessed individually for morphology, health, and reproductive condition.

Health assessments were conducted to evaluate the condition of horse mussel populations and included measurements of growth, reproductive, and pathology endpoints. Size and condition metrics included shell length, shell width, shell weight, tissue wet weight, and age distribution. Reproductive assessments included determination of gonad index, reproductive timing index, and sex. Pathology examinations were also conducted to identify any abnormalities, disease, or tissue impairments that could indicate environmental stress or contaminant exposure.

Sediment Toxicity

Sediment toxicity testing was conducted on samples collected from the same 14 stations used for sediment chemistry analysis. The 2025 sediment toxicity tests for Clover included the 10-day Mysid survival and growth, 48-hour bivalve larval development and survival, 20-day polychaeta survival and growth, and 10-day amphipod survival. Testing was conducted at Nautilus Environmental (Guelph, ON).

Sediment toxicity samples were collected concurrently with the sediment chemistry samples.

5.2 Results

Crab and Finfish

Tissue concentrations of a variety of contaminants associated with wastewater discharges were measured in finfish and crab tissues including metals, PAHs, PCBs, PBDEs, pesticides, dioxins/furans, pharmaceuticals, and organic compounds. Results for 2025 showed elevated PAH concentrations at the exposure locations compared to the reference location. Most other contaminants were found at similar concentrations across the exposure and reference locations. Compared to 2018, concentrations of many legacy contaminants declined at McLoughlin and Clover; however, PAHs and methylmercury increased over time.

Screening-level risk assessments found negligible to low risks to human health through seafood consumption, particularly Dungeness crab muscle and English sole fillets. Potential risk to wildlife was also assessed to be negligible to low.

The consultant report indicates overall low to negligible risk to human health and the environment based on finfish and crab tissue contaminant concentrations and the screening-level risk assessments.

Sediment Chemistry, Toxicity, and Bivalve Survey

Sediment chemistry, toxicity, and bivalve survey results for the 2025 Clover Point seafloor sampling event will be included in the Core Area Comprehensive Review planned for late 2026.

6.0 ADDITIONAL INVESTIGATIONS

CRD staff conduct additional investigations to address focused or emerging issues, clarify aspects of the program, and provide concurrent data for the assessment of environmental effects. The Society of Ecotoxicology and Chemistry (SETAC) review of the program agreed that one-time investigations are appropriate to fill information gaps, as needed (SETAC, 2006).

In 2006, the MMAG completed a comprehensive review of the list of additional investigations. Table 6.1 presents the studies that were recommended based on a risk assessment framework: contaminant source, pathways (ways in which contaminants can reach receptors) and receptors (e.g., fish, invertebrates and

human health, etc.). For each of these categories, studies were ranked as high, medium or low priority. In 2013, following the move to advance treatment, the MMAG was tasked with reviewing and reprioritizing the list, as well as adding any additional potential new studies. This review was put on hold in 2015 at the last meeting of the MMAG.

Investigations addressing emerging scientific issues are most effectively conducted through collaborative research programs. For instance, when concerns around pharmaceuticals and personal care products (PPCPs) first arose, laboratory methods for quantification of these substances were not yet commercially available in Canada. As a result, early assessments were carried out as research programs leveraging shared resources with university research laboratories. Since then, commercial laboratories have established standardized methods, and PPCP analyses are now a routine component of the EMP.

Studies that were underway in 2006 have since been completed or are continuing, but new investigations from Table 6.1 have not been initiated. However, several opportunistic collaborative opportunities have come up in recent years. Section 6.1 summarizes investigations that were ongoing, completed or initiated in 2025.

Table 6.1 Core Area Additional Investigations Prioritization by MMAG (2006)

Category	Investigation	Description and Characteristics	2006 Rating	Status/ Anticipated Initiation Date	Anticipated Completion Date
Contaminant Source	Study to address the presence of endocrine disrupting compounds and PPCP in wastewater and the potential effects on the receiving environment.	The first part of an overall phased approach to study these substances will be to measure the concentrations of a group of substances in wastewater. This is an area of emerging concern related to human health and potential environmental effects (chemical, biological, and toxicological).	High	Initiated in 2004.	Completed in 2010.
	Assessment of contaminants associated with oil and grease.	Determination of contaminants associated with oil and grease originating from the outfalls. Relates to the potential human health and environmental effects issues (e.g., windsurfers, seagulls, etc.). The first phase of this investigation will be to undertake a literature review.	Medium	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD
	Identification of pathogens in wastewater and the presence of these in surface waters around the outfalls.	Analysis of wastewater for different types of pathogens that have the potential to affect human health and determine if these pathogens are present in the receiving environment around the outfalls (related to die-offs, etc., in marine waters).	Low	Enterococci was added to the bacteriological target analyte list in 2011. Consideration of additional pathogens will be re-evaluated in the advisory group additional investigation review.	TBD
	Bacteria source identification.	Determine the different sources of fecal coliform to differentiate between various mammals, such as cows, dogs and humans.	Low	Conducted at near and far-field sites.	Completed in 2021.
Pathways	Sediment transport/deposition/ re-suspension.	The first step in this investigation would include a determination of the different particle size fractions in wastewater (this could be conducted through a literature review and/or through laboratory experiments). The second phase would include the determination of the settling of particles from the discharge onto sediments. Results from these analyses would be used in the overall assessment of sediment particle deposition and the subsequent movement of sediments around the outfalls.	High	Initiated in 2005 (study is on hold – will be re-evaluated as part of the advisory group additional investigation review). The priority of this investigation is now likely lower due to the implementation of tertiary treatment and the subsequent ≈95% reduction in effluent solid concentrations.	TBD

Table 6.1 Cont'd

Category	Investigation	Description and Characteristics	2006 Rating	Status/ Anticipated Initiation Date	Anticipated Completion Date
Pathways, *cont'd*	Conduct a sediment core sampling program.	Determination of sedimentation and mixing rates and the fluxes of contaminants near the outfalls and at reference sites. A mass balance approach could be used where rates of contaminant accumulation in sediments are compared with the rate of contaminant discharge from the outfalls in an attempt to determine the proportion of each contaminant captured by and stored in the sediments. A sediment trap study could be added to study contaminant transport in the near bottom nepheloid layer.	Medium	Initiated in 2006 in conjunction with the Institute of Ocean Sciences.	Completed in 2011.
Receptors and Potential Effects	Effects of endocrine disrupting compounds and PPCP on the receiving environment.	As part of a phased approach to study effects of endocrine disrupting compounds, laboratory exposures, bioassay and/or caged studies (or an organism found around the outfall) could be conducted to assess the potential effects of these substances on the receiving environment around the outfalls.	High	Collaborative study with UVic on toxicogenomic effects to benthic invertebrates was initiated in 2007.	Funding not secured and project was shelved.
	Assessment of chemical concentrations in tissue of different trophic level organisms (including higher trophic levels).	Measurement of contaminants in crab, finfish or other organisms near the outfalls would provide a basis for a food-ingestion human health risk assessment. This information could also be used to model bioconcentration and biomagnification of contaminants to higher trophic levels near the outfalls.	High	A finfish sampling program was added to the five-year monitoring cycle.	Results were presented in the 2019 annual report. Study was repeated in 2025.
	Identification of biological resources.	Identification of the harvestable organisms around the outfalls.	Low	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD
	Clover mussel population biology.	Conduct some additional studies on the mussel population around the Clover outfall (e.g., reproductive cycle, health, etc.). Additional data relates to the current monitoring and to potential studies on emerging chemicals.	Low	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD
	Levels of pathogens in biota. (e.g., epibenthic, etc.)	Assess the presence and concentration of pathogens in biota near the outfalls.	Low	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD
	Assess potential risks associated with pathogens/antibacterial resistance.	A literature review, risk assessment or a pilot study could be conducted to study antibiotic bacteria and the relevance as a potential emerging concern to human health, wildlife and domestic animals.	Low	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD
	Investigate the structure of algal plankton communities.	Assess the potential effects of the wastewater discharges on algal communities (planktonic and benthic).	Low	No dates (study will be re-evaluated in the advisory group additional investigation review).	TBD

Notes:
TBD – to be determined according to advisory group additional investigations review findings.

6.1 Investigations Completed or Underway from 2021 - 2025

The EMP completed or participated in the following additional investigations:

- Continuation of efforts to assess microplastics in wastewater, biosolids and environmental samples.
- Continuation of a collaborative project with Biologica Environmental Services Ltd., UVIC, and Metro Vancouver to develop benthic invertebrate toxicogenomic monitoring tools.
- Continuation of a BC Centre for Disease Control and the Public Health Agency of Canada collaboration to assess COVID-19, influenza and RSV presence in BC and Canadian wastewaters.

6.1.1 Microplastic Analysis

Microplastics are an emerging environmental concern. These contaminants are ubiquitous in the environment and wastewater treatment plants have been identified as significant point sources. Over the past decade, the CRD has collaborated with several organizations working to develop methods for analyzing microplastics in wastewater, marine waters and marine life. Only recently, by late 2023, have commercial laboratories begun offering microplastic analysis services using relatively standardized methods.

The CRD is considering a follow-up microplastics survey in 2026 in support of a CRD Regional Source Control Program public outreach project aimed at reducing microplastics inputs into the wastewater collection system. Through this survey, the CRD would collect baseline microplastics wastewater influent loading data, building on the 2024 study, for use in comparison to a second set of sampling events planned for after the public outreach campaign concludes. The wastewater influent loadings data from before and after the public outreach campaign will then be compared to determine whether the per-capita microplastics loadings were reduced. The Regional Source Control Program may use these results as a metric of campaign success.

6.1.2 Benthos Toxicogenomic Tool Development

Benthic taxonomy is a useful tool for the assessment of anthropogenic stressors and determining the environmental impacts of the Macaulay outfall. Taxonomic assessments, however, are labour- and time-intensive and can be costly. In addition, the revised monitoring program five-year monitoring cycle has a reduced frequency of benthos assessments compared to programs that took place pre-2011. This has resulted in a loss of temporal and spatial resolution for the program.

In 2016, Biologica Environmental Services Ltd. and a UVIC researcher presented CRD staff with a research project that would result in the development of a benthos toxicogenomic tool that would be inexpensive relative to a full taxonomic assessment. This tool could be used in years when seafloor sampling does not take place and at historical monitoring stations that have been abandoned. The CRD collaborated on developing similar toxicogenomic tools for the Clover Point horse mussels (Veldhoen et al., 2009; Veldhoen et al., 2011; CRD, 2011); development of these tools was put on hold following the provincial order to install further treatment.

Biologica is the financial driver of the research and development project, in collaboration with the UVIC researcher that historically developed Clover mussel eDNA tools. To date, CRD monitoring program staff have provided benthos samples collected in 2017, 2019 and 2022, as well as access to the archived Macaulay taxonomic reference collection. These were used to identify taxa to prioritize for further toxicogenomic work-up and by various UVIC co-op students for preliminary method development.

In 2019, Biologica and UVIC were successful in obtaining a grant application to fully implement the project and a five-year project was initiated. The CRD and Metro Vancouver were both financial supporters of the project and will continue to provide sampling vessel and sample access throughout the project's duration.

The team has confirmed the best field sample collection methods to optimize eDNA signals and has since developed assays for several positive, negative and control benthic species to assess wastewater effects

around marine outfalls in the Salish Sea. Work is progressing on isolating eDNA from additional indicator species using sediment samples collected during the September 2022 and 2024 seafloor sampling program around the McLoughlin and Macaulay outfalls.

Results have been presented at various scientific conferences and in a recently published journal article (Acharya-Patel et al., 2025). More journal articles are anticipated as the development project concludes. The tool is expected to be incorporated into the routine McLoughlin/Macaulay seafloor monitoring program in future monitoring years.

6.1.3 COVID-19 in Wastewater

Throughout the world, researchers have been investigating ways to predict timing of COVID-19 and other pathogen outbreaks to inform health care planning. Wastewater epidemiology is now widely used to predict outbreaks of various pathogens sometimes as much as a week or two before patients start presenting with widespread symptoms in health care facilities. The CRD has been participating in related studies since 2020.

The CRD initially provided weekly wastewater samples from Macaulay, Clover and the Saanich Peninsula wastewater treatment plants to a consortium of researchers from UVIC and Pani Energy Inc. (Victoria, BC). McLoughlin samples were provided once the new plant was commissioned in early 2021. The samples were used to develop a method to detect COVID-19 in wastewater, determine the sensitivity of the method, and whether results correlate with the number of reported cases in community. Results from this study can be found in Masri *et. al*., (2022).

In 2022, the CRD started providing the BC Centre for Disease Control (BCCDC) with McLoughlin wastewater samples that were initially analyzed for COVID-19, but were then expanded to include influenza and Respiratory Syncytial Virus (RSV) analyses. CRD results, along with other treatment plants throughout the province, can be found via an online data dashboard at https://bccdc.shinyapps.io/respiratory_wastewater/.

In addition, the CRD started providing McLoughlin wastewater samples in May 2024 to the National Microbiology Laboratory at the Public Health Agency of Canada, also for analysis of COVID-19, influenza and RSV. These results are used by national health authorities, in conjunction with the BCCDC results, to track communicable disease patterns across the country.

7.0 CONCLUSIONS

The 2025 monitoring results reflect the continued optimization of treatment processes at the MPWWTP, which now provides tertiary wastewater treatment for the Core Area. Commissioning of the MPWWTP began in August 2020, with flows gradually diverted from the Macaulay and Clover pump stations to the new facility. By 2021, all core area flows were being treated at the MPWWTP. While EMP requirements remain in place for Macaulay and Clover, routine monitoring is focussed on McLoughlin and bypass/overflow events. The routine monitoring components of the program, and the additional investigations, served to effectively assess the impacts of the McLoughlin, Macaulay, and Clover discharges on the marine receiving environment.

CRD staff conducted MPWWTP influent and effluent sampling throughout 2025 to meet regulatory compliance requirements and to determine contaminant removal efficiency of the tertiary treatment processes.

In 2025, CRD staff conducted routine receiving environment monitoring of surface water and the water column at McLoughlin. No surface water or water column sampling at Macaulay or Clover took place because overflow events were not coincident with the routine McLoughlin sampling and weather conditions were unsafe for small vessel operation.

Sediment and mussel samples were collected for Clover Point in 2025 with results to be presented in the Core Area Comprehensive Review scheduled to begin in late 2026. The finfish and crab study was completed for McLoughlin, Macaulay and Clover in 2025 with report findings showing negligible to low risk to human health and the environment.

No new research or additional investigations were conducted in 2025; however, planning for additional microplastics surveys are ongoing for 2026. These investigations continue to address gaps in the routine monitoring program or emerging environmental and human health concerns related to the discharge of wastewater to the marine environment.

The MPWWTP treatment processes were still undergoing optimization into 2025, with an expectation that optimization will be completed during this year. The results for 2025 demonstrate the efficacy of treatment and show reductions of impacts to the marine environment when compared to historical monitoring results. The installation of tertiary treatment was expected to substantively reduce overall contaminant loading to the environment and reduce the footprint of impact. This expectation has been reflected in the 2025 results. The CRD is committed to continuing the EMP to assess these improvements both spatially and temporally.

7.1 Wastewater

McLoughlin effluent discharge met Federal regulatory requirements throughout 2025; however, Provincial registration requirements were only met for two months of the year. Provincial regulatory limits for monthly average CBOD slightly exceeded the 10 mg/L requirement for all months except for August and November; monthly average TSS met the 10 mg/L requirement for five months of the year. Maximum TSS concentrations were in compliance with Provincial requirements throughout 2025 and maximum CBOD concentrations were compliant for all but 6 days across four months. The CRD is in discussions with ENV to allow a monthly average of 25 mg/L for TSS and CBOD for McLoughlin effluent, which is consistent with the federal limit. The proposed change would result in the TSS and CBOD permit limit of 10 mg/L no longer being in effect. If the limit is relaxed, the MPWWTP is expected to be compliant in the future.

Wastewater priority substance monitoring results confirmed the efficacy of the tertiary treatment plant to substantively reduce concentrations and loadings of contaminants to the marine receiving environment relative to historical untreated discharges out of Macaulay and Clover. With the exception of bacteriological indicators, the estimated receiving environment concentrations were predicted to meet applicable provincial and federal water quality guidelines for the protection of human health and aquatic life outside of the IDZ based on minimum dilution modelling.

Acute toxicity results for McLoughlin effluent were acceptable for all 2025 rainbow trout and invertebrate toxicity tests. These results represent a significant improvement over historical Macaulay and Clover discharge practices. McLoughlin effluent also showed much lower chronic toxicity effects than were observed for historical Macaulay and Clover effluents, further affirming the value of advanced treatment to reduce the potential for adverse effects to organisms around the outfall.

Bacteriological guideline exceedances are expected to continue at McLoughlin because effluent disinfection was not included as a treatment process. Despite this, the magnitude and duration of the exceedances have decreased substantially relative to historical Macaulay and Clover flows; bacterial concentrations in the McLoughlin final effluent are an order of magnitude lower than for Macaulay and Clover effluents. In addition, overflows from the Clover long outfall now only occur during significant rain events and have not occurred at Macaulay due to rainfall to date. Future consideration of the need to disinfect effluent will be subject to ongoing monitoring of the impact of the treated McLoughlin effluent and wet weather overflows. Wet weather discharges will be further reduced through the ongoing implementation of CRD and municipal inflow and infiltration reduction programs.

The CRD monitors many emerging contaminants of concern in both wastewater influent and final effluent. The potential impacts of these substances on the environment is less-well understood than those with regulatory guidelines or standards. The CRD attempts to assess the risk of these contaminants through the collection of multiple lines of evidence such as water quality, acute and chronic toxicity, sediment toxicity, tissue chemistry, and through additional investigations as described in Section 6.0.

7.2 Reclaimed Water

The reclaimed water system was disconnected and decommissioned in 2021 due to operational challenges. No reclaimed water samples were collected for analysis in 2025.

7.3 Surface Water

Surface water results collected quarterly demonstrated that the outfall plume was predominantly trapped beneath the ocean surface. Based on the low bacteriological concentrations at the surface, the potential risk to human health through exposure to elevated fecal coliform and enterococci concentrations around the outfall was very low. Fecal coliform and enterococci results were infrequently above thresholds used to assess risk to human health, as expected based on effluent quality and plume dispersion models for the outfall design.

The 2025 water column monitoring (at depths of 5 m or greater) confirmed that bacteriological indicators rarely exceeded either provincial or federal guidelines at the edge of the IDZ around the McLoughlin outfall. Magnitude and frequency of exceedances were much lower than historical observations around the Clover and Macaulay outfalls, affirming the environmental improvement of tertiary treatment at McLoughlin. These minor exceedances were expected, based on the wastewater concentrations of the bacteriological indicators (in the hundreds of thousands of bacteria per 100 mL) and the intended design of the outfall diffusers. The diffusers were designed specifically to ensure that the wastewater plumes were well-diluted and trapped below the surface.

Overall, the fecal coliform and enterococci results were within the concentrations predicted by plume dispersion model. The moderately high bacterial counts in the receiving environment observed during the Spring sampling events can be attributed to the authorized secondary and tertiary treatment bypass between March 26 and April 14. Summer plume surfacing events are also predicted to occur occasionally at both outfalls, associated with the morning flush in the wastewater system, weak water column stratification and slack tide. Events are predicted to be much less frequent in summer than in winter.

While the plume was predominantly trapped below the surface, with low risk to human health, there is potential ecological risk to pelagic organisms. The 2025 water column monitoring results for metals were generally low or similar to regional background levels (e.g., boron) indicating that risk to organisms was also likely low. Several metals were elevated in 2025 including cadmium, copper, nickel, and zinc. These exceedances were very infrequent and occurred sporadically at multiple depths across seasons both at

IDZ stations and reference stations. These unusual findings, also observed in 2023 and 2024, will be considered going forward and quality assurance procedures will be reviewed with all sampling staff.

Overall, the bacteriological monitoring results indicated that the surface water effects of the outfall were limited and substantively lower than the signals observed historically around the Clover and Macaulay outfalls. The McLoughlin plume was predominantly trapped at depth (below 40 m) for most of the year, and substantially diluted wastewater only occasionally reached the surface.

The CRD's continued commitment to promoting water conservation is expected to prevent increases in per capita decrease in water demand. Reduced demand and smoothing of peak demand serves to improve performance consistency of wastewater treatment processes.

7.4 Overflow and Bypass Monitoring

The conveyance system is designed with numerous shoreline sanitary and combined sewer overflow and relief points that discharge during heavy rains, planned maintenance activities or following unexpected non-routine or emergency events. Shoreline monitoring is required to assess human health risk for people engaged in recreational activities on beaches adjacent to the overflows. Overflow monitoring was conducted in response to one set of overflow incidents in December 2025. Previous monitoring confirmed that wastewater overflow signals typically dissipate within 48-hours. Overall, risk to human health is short-lived following bypass and overflow events.

A temporary authorized bypass of secondary and tertiary treatment at MPWWTP was conducted from March 26 to April 14, 2025, to facilitate essential maintenance. Wastewater continued to undergo primary treatment and was discharged through the plant's long outfall. Monitoring of effluent flow, water quality, and toxicity confirmed that both discharge volumes and effluent quality met all federal and provincial authorization requirements. Effluent quality improved rapidly following reinstatement of full treatment processes on April 14.

Receiving environment monitoring indicated that wastewater remained well below the water surface, with no exceedances of recreational water quality guidelines at far-field monitoring locations. As predicted, there were some minor exceedances of shellfish harvesting water quality guidelines at a few of the far-field monitoring locations. Overall, results demonstrated that environmental and human health risks associated with the bypass were low and localized, with limited detectable wastewater signal at far-field monitoring stations.

7.5 Seafloor Monitoring

The finfish and crab study was conducted in 2025 to assess the potential impacts of wastewater discharges on human health and the environment. Based on biological indicators and tissue concentration analyses, the overall risk posed by the McLoughlin wastewater discharge was determined to be negligible to low.

In 2025, sediment chemistry, toxicity testing, and mussel sampling were completed at Clover Point. The results of these studies will be evaluated and reported as part of the Core Area Comprehensive Review, which is scheduled to begin in late 2026.

7.6 Additional Investigations

Additional investigations are important elements of the program that address specific questions or issues pertaining to the monitoring program, clarify aspects of the program and provide concurrent data for the assessment of environmental effects.

The CRD has continued to work with the BCCDC on respiratory illness surveillance in wastewater in 2025. McLoughlin samples are also now provided to the Public Health Agency of Canada under Health Canada for a similar program. These findings help inform public health authority decision-making related to respiratory illness response.

The CRD has continued to work with Biologica, University of Victoria and Metro Vancouver to develop an inexpensive benthos toxicogenomic tool that could be used to fill in spatial and temporal gaps in the benthic invertebrate monitoring program. The tool is still being refined and will be incorporated into the routine monitoring program once complete.

Other additional investigations are under consideration for 2026, but have yet to be confirmed.

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APPENDIX A

ENVIRONMENTAL MONITORING PROGRAM HISTORY

Appendix A1 Program History

CRD staff have conducted monitoring of wastewater discharges, surface waters and the seafloor environment in the vicinity of the Macaulay and Clover outfalls since the late 1980s. The program has undergone several changes over the years. Monitoring of wastewater, marine surface waters close to the outfalls, and benthic communities were conducted in the 1970s and 1980s in collaboration with the University of Victoria (UVIC) and independent consultants. Additional investigations were undertaken to more clearly define the effects of the outfalls on the receiving environment. In 1992, a detailed investigation of effects related to the outfalls was conducted by EVS Environment Consultants Ltd. (1992) (EVS). This study included the analysis of wastewater and sediment chemistry, sediment toxicity, and the assessment of the health of biological communities near the outfalls. The 1992 study results were used to design a regular monitoring and assessment program, in collaboration with an advisory group made up of academics and other experts in environmental effects assessment and monitoring (Marine Monitoring Advisory Group (MMAG).

From 1992 until 1999, the program consisted of monthly wastewater analysis for conventional parameters, quarterly wastewater analysis for priority substances, monthly surface water (<1 m depth) sampling for indicator bacteria, yearly sediment chemistry analysis and seafloor organism monitoring on a three-year cycle. Starting in 2000, the program was again revised in consultation with MMAG, with changes primarily in increased frequency of monitoring. Special investigations continued to supplement the routine monitoring as necessary.

Toxicity testing also used to be a component of the monitoring program for both wastewater and sediment. Wastewater toxicity testing invariably failed, primarily due to the high ammonia concentrations in the Macaulay and Clover wastewaters. Because ammonia is not typically a concern in the marine environment, it was agreed, in consultation with MMAG and ENV, that wastewater toxicity testing be dropped from the program. Sediment toxicity testing was also a component of the program and was dropped following the 1992 EVS study (EVS, 1992) due to confounding total organic carbon concentrations. Both sediment and wastewater toxicity testing, using updated methodologies, were reintroduced to the monitoring program in 2011 as part of a revised monitoring program for which more details are provided below.

The Society of Environmental Toxicology and Chemistry (SETAC) completed a review of the CRD Core Area LWMP in 2006 (SETAC, 2006). This review panel commented that the monitoring program was substantial and well designed, and that continuing it would be appropriate for assessing the CRD wastewater discharge in the future. However, the panel made several recommendations to enhance the monitoring program, including considering more extensive monitoring with better spatial and temporal resolution in the far-field to provide a better understanding of the fate of the surfaced sewage plume. Since the SETAC review, the decision to move to advanced treatment was made.

In 2008, CRD and ENV staff initiated a review of the objectives and design of the monitoring program, considering the SETAC review and plans to install additional treatment for the Macaulay and Clover wastewaters. As a result of this review, a revised monitoring program based on a five-year cycle was implemented in 2011. Both the MMAG and consultants familiar with the monitoring program data reviewed the new program (Golder, 2011) and provided recommendations. There is also a commitment within the five-year monitoring program that CRD and ENV staff will meet on an annual basis to review the results of the previous monitoring year.

The monitoring program design for Cycle 3 and beyond has been revised based on these annual collaborative reviews, comments from the advisory group and other external expert reviews, and the transition to treatment at McLoughlin in 2020. Since 2020, EMP revisions have primarily included shifting most of the wastewater and surface water monitoring effort to McLoughlin and adding new stations to the seafloor monitoring to encompass the predicted impact footprint of the new McLoughlin outfall. Monitoring of the new seafloor locations began in 2019, along with effluent quality monitoring once the MPWWTP commissioning began in 2020. In addition, wastewater monitoring at Macaulay and Clover was significantly reduced as of December 31, 2020. This shift to monitoring at the McLoughlin facility aligned with the cancellation of the Federal Transitional Authorizations for Clover and Macaulay. The monitoring program shifted to McLoughlin starting in 2021, which aligns with Cycle 3, Year 1 of the EMP.

With the commissioning of the MPWWTP came the need to manage sludge and, subsequently, biosolids produced at the Residuals Treatment Facility (RTF) located at Hartland Landfill. As previously noted, the RTF is under a separate provincial authorization. Biosolids monitoring results are presented in other reports (CRD, 2024 and HRMG, 2024).

APPENDIX A2

GUIDANCE MANUAL FOR THE ASSESSMENT AND ANALYSIS OF WMEP DATA

Available upon request.

Contact: CRD Environmental Monitoring Program 250.360.3082

APPENDIX B
2025 WASTEWATER MONITORING

Appendix B1	Priority Substance List and Sampling Frequency
Appendix B2	McLoughlin Point Wastewater Treatment Plant Influent Flow (m^3/day)
Appendix B3	McLoughlin Point Wastewater Treatment Plant Tertiary Effluent Flow (m^3/day)
Appendix B4	McLoughlin Point WWTP Federal and Provincial Wastewater Compliance Results
Appendix B5	Frequency of Detection, Loadings and Percent Removal of Substances in McLoughlin Influent and Final Effluent
Appendix B6	Acute Toxicity Test Results (available upon request)
Appendix B7	Chronic Toxicity Test Results (available upon request)

Appendix B1 Priority Substance List and Sampling Frequency

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
CONVENTIONALS		
alkalinity	√	√
biochemical oxygen demand (BOD)	√	√
carbonaceous biochemical oxygen demand (CBOD)	√	√
chemical oxygen demand (COD)	√	√
chloride	√	√
conductivity	√	√
cyanide-SAD	√	√
cyanide-WAD	√	√
enterococci	√	√
fecal coliforms	√	√
hardness, total	√	√
nitrogen, ammonia	√	√
nitrogen, nitrate	√	√
nitrogen, nitrite	√	√
nitrogen, total Kjeldahl	√	√
oil and grease, mineral	√	√
oil and grease, total	√	√
organic carbon, total	√	√
pH	√	√
sulphate	√	√
sulphide	√	√
suspended solids, total	√	√
METALS		
Total Metals		
aluminum	√	√
antimony	√	√
arsenic	√	√
barium	√	√
beryllium	√	√
cadmium	√	√
calcium	√	√
chromium	√	√
chromium VI	√	√
cobalt	√	√
copper	√	√
iron	√	√
lead	√	√
magnesium	√	√
manganese	√	√
mercury	√	√
molybdenum	√	√
nickel	√	√
phosphorus	√	√
potassium	√	√
selenium	√	√
silver	√	√

Appendix B1, cont'd

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
thallium	√	√
tin	√	√
zinc	√	√
Dissolved Metals		
aluminum	√	√
antimony	√	√
arsenic	√	√
barium	√	√
beryllium	√	√
cadmium	√	√
calcium	√	√
chromium	√	√
cobalt	√	√
copper	√	√
iron	√	√
lead	√	√
magnesium	√	√
manganese	√	√
mercury	√	√
molybdenum	√	√
nickel	√	√
phosphorus	√	√
potassium	√	√
selenium	√	√
silver	√	√
thallium	√	√
tin	√	√
zinc	√	√
Speciated Metals		
dibutyltin	√	
dibutyltin dichloride	√	
methyl mercury	√	
monobutyltin	√	
monobutyltin trichloride	√	
tributyltin	√	
tributyltin dichloride	√	
ALDEHYDES		
acrolein	√	√
PHENOLIC COMPOUNDS		
total phenols	√	√
CHLORINATED PHENOLICS		
2,4,6-trichlorophenol	√	√
2,4/2,5-dichlorophenol	√	√
2-chlorophenol	√	√
4-chloro-3-methylphenol	√	√
pentachlorophenol	√	√
NON-CHLORINATED PHENOLICS		
2,4-dimethylphenol	√	√
2,4-dinitrophenol	√	√

Appendix B1, cont'd

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
2-methyl-4,6-dinitrophenol	√	√
2-nitrophenol	√	√
4-nitrophenol	√	√
phenol	√	√
ORGANOCHLORINE PESTICIDES		
2,4-DDD	√*	
2,4-DDE	√*	
2,4-DDT	√*	
4,4-DDD	√*	
4,4-DDE	√*	
4,4-DDT	√*	
aldrin	√*	
alpha chlordane	√*	
alpha-endosulfan	√*	
alpha-BHC	√*	
beta-endosulfan	√*	
beta-BHC	√*	
chlordane	√*	
delta-BHC	√*	
dieldrin	√*	
endosulfan sulfate	√*	
endrin	√*	
endrin aldehyde	√*	
gamma chlordane	√*	
heptachlor	√*	
heptachlor epoxide	√*	
gamma BHC	√*	
methoxyclor	√*	
mirex	√*	
octachlorostyrene	√*	
toxaphene	√*	
POLYCHLORINATED BIPHENYLS		
PCB-1	√*	
PCB-3	√*	
PCB-4/10	√*	
PCB-5/8	√*	
PCB-15	√*	
PCB-18	√*	
PCB-19	√*	
PCB-23/34	√*	
PCB-28	√*	
PCB-31	√*	
PCB-37	√*	
PCB-40	√*	
PCB-44	√*	
PCB-43/49	√*	
PCB-52/73	√*	
PCB-54	√*	
PCB-56/60	√*	

Appendix B1, cont'd

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
PCB-66/80	√*	
PCB-77	√*	
PCB-81	√*	
PCB-87/115/116	√*	
PCB-89/90/101	√*	
PCB-93/95	√*	
PCB-99	√*	
PCB-104	√*	
PCB-105/127	√*	
POLYCYCLIC AROMATIC HYDROCARBONS		
dibenzo(a,h)anthracene	√*	√
fluoranthene	√*	√
fluorene	√*	√
indeno(1,2,3-c,d)pyrene	√*	√
naphthalene	√*	√
phenanthrene	√*	√
pyrene	√*	√
total high molecular weight - PAH	√*	√
total low molecular weight - PAH	√*	√
total PAH	√*	√
SEMIVOLATILE ORGANICS		
Phthalates		
bis(2-ethylhexyl)phthalate	√	√
butylbenzyl phthalate	√	√
diethyl phthalate	√	√
dimethyl phthalate	√	√
di-n-butyl phthalate	√	√
di-n-octyl phthalate	√	√
MISCELLANEOUS SEMIVOLATILE ORGANICS		
1,2,4-trichlorobenzene	√	
1,2-diphenylhydrazine	√	√
2,4-dinitrotoluene	√	√
2,6-dinitrotoluene	√	√
3,3-dichlorobenzidine	√	√
4-bromophenyl phenyl ether	√	
4-chlorophenyl phenyl ether	√	
benzidine	√	√
bis(2-chloroethoxy)methane	√	
bis(2-chloroethyl)ether	√	
bis(2-chloroisopropyl)ether	√	
hexachlorobenzene	√	
hexachlorobutadiene	√	
hexachlorocyclopentadiene	√	
hexachloroethane	√	
isophorone	√	√
nitrobenzene	√	√
N-nitrosodimethylamine	√	√
N-nitrosodi-n-propylamine	√	√
N-nitrosodiphenylamine	√	√

Appendix B1, cont'd

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
VOLATILE ORGANICS		
Monocyclic Aromatic Hydrocarbons		
benzene	√	√
chlorobenzene	√	√
1,2-dichlorobenzene	√	√
1,3-dichlorobenzene	√	√
1,4-dichlorobenzene	√	√
ethylbenzene	√	√
m & p xylenes	√	√
o-xylene	√	√
styrene	√	√
toluene	√	√
xylenes	√	√
Aliphatic		
acrylonitrile	√	√
methyl tertiary butyl ether	√	√
Chlorinated Aliphatic		
1,1,1,2-tetrachloroethane	√	√
1,1,1-trichloroethane	√	√
1,1,2,2-tetrachloroethane	√	√
1,1,2-trichloroethane	√	√
1,1-dichloroethane	√	√
1,1-dichloroethene	√	√
1,2-dichloroethane	√	√
1,2-dichloropropane	√	√
bromomethane	√	√
chloroethane	√	√
chloroethene	√	√
chloromethane	√	√
cis-1,2-dichloroethene	√	√
cis-1,3-dichloropropene	√	√
dibromoethane	√	√
dibromomethane	√	√
dichloromethane	√	√
tetrabromomethane	√	√
tetrachloroethene	√	√
tetrachloromethane	√	√
trans-1,2-dichloroethene	√	√
trans-1,3-dichloropropene	√	√
trichloroethene	√	√
trichlorofluoromethane	√	√
Trihalomethanes		
bromodichloromethane	√	√
chlorodibromomethane	√	√
tribromomethane	√	√
trichloromethane	√	√
Ketones		
dimethyl ketone	√	√
methyl ethyl ketone	√	√

Appendix B1, cont'd

Substance	McLoughlin WWTP Influent and Effluent	
	(full list)	(modified list)
	Quarterly	Monthly
methyl isobutyl ketone	√	√
alpha-terpineol	√	√
High Resolution Analysis		
Nonylphenols (NP)	√	
Polybrominated Diphenyl Ethers (PBDE)	√	
Polycyclic Aromatic Hydrocarbons (PAH)	√	
Per and Polyfluoroalkyl Substances (PFOS)	√	
Pharmaceuticals and Personal Care Products (PPCP)	√	
Dioxins and Furans (PCDD)	√	
Polychlorinated Biphenyls (PCB)	√	
TOXICITY-ACUTE		
96-hr Rainbow Trout - pH stabilized		√
48-hr Daphnia magna		√
TOXICITY-CHRONIC (Annual)		
Rainbow Trout Avelin and Egg Test (EA)	√**	
Ceriodaphnia 7-day	√**	
Top smelt 7-day	√**	
Echinoderm fertilization	√**	

Notes:
√* Analyses were conducted at a higher resolution (i.e., at SGS AXYS Analytics), **annually.

Appendix B2 McLoughlin Point Wastewater Treatment Plant Influent Flow (m^3/day)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	106,840	100,492	101,068	106,368	80,795	80,176	78,350	76,604	82,518	80,501	163,200	99,090
2	107,690	99,687	100,740	104,882	81,648	80,890	81,510	74,275	81,601	78,243	109,600	94,340
3	129,540	95,329	96,362	98,846	81,395	79,117	77,920	74,584	80,669	78,111	95,700	93,940
4	119,420	94,065	96,579	96,656	82,439	79,125	78,020	78,797	80,751	79,993	89,400	121,720
5	119,060	92,575	94,400	95,701	83,200	79,041	86,968	78,223	79,614	81,333	89,500	115,930
6	111,030	94,467	92,744	105,499	80,299	79,412	78,575	80,075	79,929	79,126	120,900	106,520
7	107,790	93,094	91,768	101,829	82,587	77,628	80,132	77,961	83,155	79,454	100,400	107,080
8	108,130	95,035	104,420	97,764	80,895	79,089	80,466	77,194	81,039	80,288	92,300	178,350
9	105,520	97,146	98,580	95,205	82,354	81,822	79,945	75,959	80,207	80,001	90,700	160,030
10	108,330	94,546	95,269	95,475	79,903	82,041	78,159	76,910	80,580	81,631	93,350	299,840
11	100,000	92,493	96,556	93,611	83,066	78,732	77,628	78,130	79,721	84,924	87,960	226,090
12	102,840	92,340	96,508	91,281	81,666	75,810	75,966	78,723	79,572	83,430	84,670	167,960
13	99,995	90,017	93,998	91,609	82,299	78,580	77,852	77,713	79,625	81,717	104,830	135,660
14	97,976	89,697	94,025	90,349	80,667	78,070	79,168	80,177	84,660	81,756	95,840	134,520
15	95,423	89,527	130,839	90,077	85,473	80,920	78,800	97,932	80,492	82,503	102,770	175,240
16	93,600	102,313	113,826	87,646	85,264	83,020	80,437	86,998	79,981	78,958	93,910	226,660
17	91,410	104,758	105,528	85,666	88,097	79,550	80,098	81,332	80,833	77,731	90,850	289,740
18	92,717	96,034	96,299	86,338	80,110	77,820	77,180	80,374	79,982	110,121	88,160	209,350
19	94,030	100,821	96,191	83,945	90,724	78,050	76,850	78,622	78,922	110,052	88,830	172,730
20	92,237	94,125	101,350	84,399	82,950	80,850	78,792	79,323	78,842	87,899	86,790	193,410
21	90,640	104,241	115,729	86,730	81,145	113,050	80,884	78,856	93,511	81,958	85,890	189,730
22	91,265	122,902	104,707	85,551	80,962	83,080	80,169	76,713	81,861	81,972	85,960	164,680
23	92,160	136,668	190,804	84,713	80,007	82,130	78,645	75,493	79,096	83,838	107,370	148,300
24	88,220	124,704	237,046	83,594	79,062	81,010	78,224	78,521	79,715	95,382	88,990	138,460
25	88,546	134,662	166,545	85,174	80,444	83,210	77,630	80,583	79,756	85,178	113,720	123,770
26	89,650	116,408	129,030	81,690	79,443	85,770	75,556	83,463	78,704	102,802	104,160	128,440
27	87,772	107,597	163,191	86,802	77,468	81,210	77,749	78,413	78,010	91,800	126,540	118,130
28	87,163	103,668	139,655	83,784	78,817	77,710	77,580	79,475	79,993	96,100	103,400	112,560
29	87,715	---	126,009	83,629	82,619	77,690	78,568	80,021	86,616	97,200	96,590	108,220
30	89,702	---	120,217	83,338	78,307	78,750	78,385	76,517	81,792	86,300	95,120	106,740
31	110,822	---	113,097	---	82,698	---	78,135	76,459	---	106,300	---	104,770
Average	99,588	102,122	116,228	90,938	81,832	81,112	78,850	79,175	81,058	86,665	99,247	153,290
Maximum	129,540	136,668	237,046	106,368	90,724	113,050	86,968	97,932	93,511	110,121	163,200	299,840
Minimum	87,163	89,527	91,768	81,690	77,468	75,810	75,556	74,275	78,010	77,731	84,670	93,940
											Annual Average	**95,875**

Appendix B3 McLoughlin Point Wastewater Treatment Plant Tertiary Effluent Flow (m^3/day)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	105,330	98,706	99,303	104,998	79,101	78,284	76,968	75,126	81,175	78,900	161,200	97,510
2	105,890	98,050	98,982	103,756	80,010	79,068	80,063	72,590	80,176	77,505	108,300	92,990
3	127,520	93,630	94,520	97,822	79,620	77,252	76,531	72,890	80,177	76,589	94,400	92,630
4	117,830	91,937	94,822	95,745	80,920	77,150	76,620	77,120	79,307	78,514	88,100	120,690
5	117,450	90,607	92,556	94,526	81,505	77,221	85,535	76,463	78,256	79,789	88,000	114,230
6	109,430	92,448	91,014	104,539	78,567	77,520	76,826	78,540	78,478	77,797	119,400	105,000
7	105,790	91,299	90,042	100,755	80,806	75,868	78,388	76,315	81,819	78,031	99,000	105,490
8	105,880	93,356	102,524	96,672	78,790	77,365	78,551	75,607	79,673	78,051	91,000	176,650
9	103,600	95,557	96,771	94,097	80,525	80,079	78,338	74,540	78,860	78,364	89,500	158,140
10	106,450	92,862	93,632	95,339	78,273	80,243	76,324	75,566	79,205	80,004	92,110	297,780
11	98,080	90,775	95,092	93,402	81,269	76,920	75,936	76,652	78,384	83,333	86,800	225,160
12	101,140	90,617	94,860	90,988	79,999	73,852	74,309	77,292	78,394	81,897	83,660	166,460
13	98,320	88,441	92,145	91,225	80,496	76,667	76,146	76,278	78,197	80,202	102,920	134,160
14	96,200	88,025	92,323	89,227	79,026	76,297	77,553	78,778	83,300	80,562	94,800	133,130
15	93,840	87,997	128,746	88,535	83,883	79,287	77,401	96,064	79,174	80,974	102,760	173,210
16	91,840	100,650	111,752	85,726	83,701	81,539	78,807	85,617	78,616	77,252	93,910	224,730
17	89,760	102,681	103,849	84,831	86,443	77,987	78,485	79,995	79,355	76,130	90,850	288,470
18	90,970	94,194	103,849	84,861	78,628	76,245	75,384	79,085	78,578	108,360	88,160	207,660
19	92,460	99,030	94,486	82,930	89,107	76,565	75,269	77,318	77,498	108,548	88,830	170,760
20	90,700	92,298	99,580	82,944	81,381	79,441	77,226	77,975	77,498	86,631	86,790	191,730
21	89,050	102,348	113,871	85,150	79,554	111,457	79,371	77,466	91,902	80,480	85,890	188,450
22	89,620	120,927	102,951	83,820	79,420	81,670	78,570	75,419	80,418	80,478	85,890	163,240
23	90,740	134,741	188,606	83,001	78,457	80,698	76,998	74,158	77,699	82,584	106,560	146,930
24	86,520	122,793	235,015	82,021	77,627	79,651	76,619	77,273	77,897	93,936	87,700	137,120
25	86,870	132,760	164,759	83,569	78,977	81,870	76,063	79,178	77,456	83,764	112,440	122,490
26	88,040	114,614	127,430	80,193	77,929	84,314	73,945	82,086	77,014	101,499	102,250	127,040
27	86,019	105,724	161,551	85,198	75,375	79,847	76,206	77,023	76,290	90,500	125,180	116,710
28	85,509	101,792	138,501	82,205	77,031	76,340	75,803	78,118	78,249	94,700	102,040	111,400
29	85,953	---	125,014	82,205	80,731	76,333	77,035	78,616	84,902	95,500	95,150	106,930
30	88,058	---	119,269	81,915	76,702	77,417	76,735	78,616	80,539	85,100	93,660	105,590
31	108,919	---	112,005	---	80,947	---	76,709	75,305	---	104,800	---	103,520
Average	97,864	100,316	114,833	89,740	80,155	79,482	77,249	77,841	79,616	85,186	98,242	151,806
Minimum	85,509	87,997	90,042	80,193	75,375	73,852	73,945	72,590	76,290	76,130	83,660	92,630
Maximum	127,520	134,741	235,015	104,998	89,107	111,457	85,535	96,064	91,902	108,548	161,200	297,780
											Annual Average	**94,395**

Notes: Shaded cells indicate exceedance to maximum daily flow = 432,000 m^3/day (comprising 216,000 m^3/day tertiary treated and 216,000 m^3/day primary treatment during wet weather).

Appendix B4 McLoughlin Point WWTP Federal and Provincial Wastewater Compliance Results

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Jan 01, 2025	105330	0	7.0		11.0					
Jan 02, 2025	105890	0	8.8	7.50	14.7	29.7				
Jan 03, 2025	127520	988								
Jan 04, 2025	117830	0								
Jan 05, 2025	117450	0	7.4		7.0	26.8				
Jan 06, 2025	109430	0	7.0		8.1					
Jan 07, 2025	105790	0	6.0		6.4	24.2	3.4	3.0	360000	47000
Jan 08, 2025	105880	0	7.6		10.7					
Jan 09, 2025	103600	0	7.4	7.70	9.9	36.6				
Jan 10, 2025	106450	0								
Jan 11, 2025	98080	0								
Jan 12, 2025	101140	0	5.0		7.0	29.2				
Jan 13, 2025	98320	0	6.4		7.9					
Jan 14, 2025	96200	0	9.0	7.60	15.5	34.2			80000	30000
Jan 15, 2025	93840	0	8.0		13.2					
Jan 16, 2025	91840	0	5.2		11.1	33.6				
Jan 17, 2025	89760	0		7.65					13000	4400
Jan 18, 2025	90970	0								
Jan 19, 2025	92460	0	6.4		10.1	27.9				
Jan 20, 2025	90700	0	4.4		10.3					
Jan 21, 2025	89050	0	10.8	7.70	12.4	33.8	4.8	4.2	400000	180000
Jan 22, 2025	89620	0	8.2		12.2					
Jan 23, 2025	90740	0	9.6		13.6	43.7				
Jan 24, 2025	86520	0								
Jan 25, 2025	86870	0								
Jan 26, 2025	88040	0	9.6		14.0	37.0				
Jan 27, 2025	86019	0	6.8		16.8					
Jan 28, 2025	85509	0	13.4		16.5	30.8			340000	49000
Jan 29, 2025	85953	0	13.4		15.1					
Jan 30, 2025	88058	0	12.4	7.90	12.8	38.2				
Jan 31, 2025	108919	0	16.6		13.4					
Monthly Total :	**3033778**	**988**								
Monthly Average :	**97864**	**32**	**8.5**	**7.68**	**11.7**	**32.7**	**4.1**	**3.6**	**238600**	**62080**
Monthly Max :	**127520**	**988**	**16.6**	**7.90**	**16.8**	**43.7**	**4.8**	**4.2**	**400000**	**180000**
Monthly Min :	**85509**	**0**	**4.4**	**7.50**	**6.4**	**24.2**	**3.4**	**3.0**	**13000**	**4400**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**96875**		**8.5**	**7.68**	**11.7**	**32.7**	**4.1**	**3.6**	**238600**	**62080**
TPF = 0 Max[3] :	**117830**		**16.6**	**7.90**	**16.8**	**43.7**	**4.8**	**4.2**	**400000**	**180000**
TPF = 0 Min :	**85509**		**4.4**	**7.50**	**6.4**	**24.2**	**3.4**	**3.0**	**13000**	**4400**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**X**					
TPF > 0 # of Days[4] :		**1**								
TPF > 0 Average :	**127520**	**988**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**127520**	**988**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**127520**	**988**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Feb 01, 2025	98706	0	13.6		10.4					
Feb 02, 2025	98050	0	11.8		9.3	23.5				
Feb 03, 2025	93630	0	12.6		10.6	32.6	3.6	2.4		
Feb 04, 2025	91937	0	22.8		14.3				140000	26000
Feb 05, 2025	90607	0								
Feb 06, 2025	92448	0	12.8	7.60	10.5	24.0				
Feb 07, 2025	91299	0	9.6		15.0					
Feb 08, 2025	93356	0	10.4		64.0					
Feb 09, 2025	95557	0	9.6		13.0	35.6				
Feb 10, 2025	92862	0	11.6		14.9					
Feb 11, 2025	90775	0	11.2		12.6	24.8			590000	150000
Feb 12, 2025	90617	0	8.8		13.0					
Feb 13, 2025	88441	0	11.0	7.70	15.4	37.0				
Feb 14, 2025	88025	0								
Feb 15, 2025	87997	0								
Feb 16, 2025	100650	0	14.8		12.6	24.6				
Feb 17, 2025	102681	0	18.8		12.9					
Feb 18, 2025	94194	0	14.4	7.70	13.6	31.6	4.0	3.7	580000	75000
Feb 19, 2025	99030	0	10.0		12.2					
Feb 20, 2025	92298	0	9.4		11.2	28.4				
Feb 21, 2025	102348	0								
Feb 22, 2025	120927	172								
Feb 23, 2025	134741	1199	15.2	7.30	12.5	26.5				
Feb 24, 2025	122793	0	10.4		11.0					
Feb 25, 2025	132760	0	15.2	7.50	10.2	22.5			300000	37000
Feb 26, 2025	114614	194	12.0	7.79	14.9	1.5	2.5	1.8		55000
Feb 27, 2025	105724	0	9.0		11.5	26.6				
Feb 28, 2025	101792	0								
Monthly Total :	**2808859**	**1565**								
Monthly Average :	**100316**	**56**	**12.5**	**7.60**	**14.8**	**26.1**	**3.4**	**2.6**	**402500**	**68600**
Monthly Max :	**134741**	**1199**	**22.8**	**7.79**	**64.0**	**37.0**	**4.0**	**3.7**	**590000**	**150000**
Monthly Min :	**87997**	**0**	**8.8**	**7.30**	**9.3**	**1.5**	**2.5**	**1.8**	**140000**	**26000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**97543**		**12.4**	**7.63**	**14.9**	**28.3**	**3.8**	**3.0**	**402500**	**72000**
TPF = 0 Max[3] :	**132760**		**22.8**	**7.70**	**64.0**	**37.0**	**4.0**	**3.7**	**590000**	**150000**
TPF = 0 Min :	**87997**		**8.8**	**7.50**	**9.3**	**22.5**	**3.6**	**2.4**	**140000**	**26000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**3**								
TPF > 0 Average :	**123427**	**522**	**13.60**	**7.55**	**13.7**	**14.0**	**2.5**	**1.8**	**0**	**55000**
TPF > 0 Max[3] :	**134741**	**1199**	**15.20**	**7.79**	**14.9**	**26.5**	**2.5**	**1.8**	**0**	**55000**
TPF > 0 Min :	**114614**	**172**	**12.00**	**7.30**	**12.5**	**1.5**	**2.5**	**1.8**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Appendix B4, cont'd

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Mar 01, 2025	99303	0								
Mar 02, 2025	98982	0	10.8		10.0	28.2				
Mar 03, 2025	94520	0	7.2		10.9				660000	110000
Mar 04, 2025	94822	0	12.0		15.2	34.8	3.8	3.3		
Mar 05, 2025	92556	0	16.8		21.6					
Mar 06, 2025	91014	0	12.0	7.60	14.1	33.1				
Mar 07, 2025	90042	0								
Mar 08, 2025	102524	0								
Mar 09, 2025	96771	0	9.6		37.5	32.2				
Mar 10, 2025	93632	0	10.4		9.8					
Mar 11, 2025	95092	0	9.6		10.8	33.9			130000	38000
Mar 12, 2025	94860	0	11.0		14.1					
Mar 13, 2025	92145	0	12.6	7.50	13.7	29.7				
Mar 14, 2025	92323	0								
Mar 15, 2025	128746	0								
Mar 16, 2025	111752	0	11.0		8.5	23.6				
Mar 17, 2025	103849	0	7.4		9.1					
Mar 18, 2025	103849	0	8.8	7.50	10.4	31.2	2.9	2.5	86000	13000
Mar 19, 2025	94486	0	7.0		7.7					
Mar 20, 2025	99580	0	9.0	7.66	10.9	31.1	3.5	2.8	65000	14000
Mar 21, 2025	113871	0								
Mar 22, 2025	102951	0								
Mar 23, 2025	188606	33982	38.7	7.40	14.7	27.1				
Mar 24, 2025	235015	44497	27.2		14.9					
Mar 25, 2025	164759	0	15.2		14.2	17.4			36000	7300
Mar 26, 2025	127430	127430	60.0		47.0					
Mar 27, 2025	161551	119790	28.0		45.5	26.0				
Mar 28, 2025	138501	101981								
Mar 29, 2025	125014	123311								
Mar 30, 2025	119269	110832	69.0		77.5	40.2				
Mar 31, 2025	112005	100823	92.0		113.0					
Monthly Total :	**3559820**	**762646**								
Monthly Average :	**114833**	**24601**	**22.1**	**7.53**	**24.1**	**29.9**	**3.4**	**2.8**	**195400**	**36460**
Monthly Max :	**235015**	**127430**	**92.0**	**7.66**	**113.0**	**40.2**	**3.8**	**3.3**	**660000**	**110000**
Monthly Min :	**90042**	**0**	**7.0**	**7.40**	**7.7**	**17.4**	**2.9**	**2.5**	**36000**	**7300**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**99440**		**10.3**	**7.57**	**13.6**	**30.9**	**3.4**	**2.8**	**235250**	**43750**
TPF = 0 Max[3] :	**128746**		**16.8**	**7.66**	**37.5**	**34.8**	**3.8**	**3.3**	**660000**	**110000**
TPF = 0 Min :	**90042**		**7.0**	**7.50**	**7.7**	**23.6**	**2.9**	**2.5**	**65000**	**13000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**9**								
TPF > 0 Average :	**152461**	**84738**	**47.16**	**7.40**	**46.7**	**27.7**	**0.0**	**0.0**	**36000**	**7300**
TPF > 0 Max[3] :	**235015**	**127430**	**92.00**	**7.40**	**113.0**	**40.2**	**0.0**	**0.0**	**36000**	**7300**
TPF > 0 Min :	**112005**	**0**	**15.20**	**7.40**	**14.2**	**17.4**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Apr 01, 2025	104998	93438	94.0		133.0	39.7			3400000	770000
Apr 02, 2025	103756	90928	79.0		117.0					
Apr 03, 2025	97822	85011	90.0	7.10	148.0	45.1				
Apr 04, 2025	95745	81399								
Apr 05, 2025	94526	81597								
Apr 06, 2025	104539	90883	90.0		110.0	35.3				
Apr 07, 2025	100755	85867	97.0		127.0					
Apr 08, 2025	96672	80916	69.0		156.0	42.3	4.5	3.6	5900000	600000
Apr 09, 2025	94097	81869								
Apr 10, 2025	95339	82249	78.0	7.60	142.0	47.4				
Apr 11, 2025	93402	79712								
Apr 12, 2025	90988	65846	102.0		140.0					
Apr 13, 2025	91225	51650	78.0		112.0	49.1				
Apr 14, 2025	89227	11935	50.0		57.1					
Apr 15, 2025	88535	0	16.5		45.1	52.3			4600000	850000
Apr 16, 2025	85726	0	15.2	7.90	38.5	40.4				
Apr 17, 2025	84831	0								
Apr 18, 2025	84861	0	11.0		22.0					
Apr 19, 2025	82930	0								
Apr 20, 2025	82944	0	12.0		15.2	36.5				
Apr 21, 2025	85150	0	18.0		23.4				3000000	550000
Apr 22, 2025	83820	0	17.2		23.9	44.7	3.6	3.1		
Apr 23, 2025	83001	0	19.2		26.1					
Apr 24, 2025	82021	0	16.0	7.90	22.1	41.9				
Apr 25, 2025	83569	0								
Apr 26, 2025	80193	0								
Apr 27, 2025	85198	0	18.8		16.3	46.4				
Apr 28, 2025	82205	0	16.8	7.76	16.6	2.0	4.4	3.3	110000	51000
Apr 29, 2025	82205	0	9.6		15.8	43.7			650000	64000
Apr 30, 2025	81915	0	14.8		16.5					
Monthly Total :	**2692195**	**1063300**								
Monthly Average :	**89740**	**35443**	**46.0**	**7.65**	**69.3**	**40.5**	**4.2**	**3.3**	**2943333**	**480833**
Monthly Max :	**104998**	**93438**	**102.0**	**7.90**	**156.0**	**52.3**	**4.5**	**3.6**	**5900000**	**850000**
Monthly Min :	**80193**	**0**	**9.6**	**7.10**	**15.2**	**2.0**	**3.6**	**3.1**	**110000**	**51000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**83694**		**15.4**	**7.85**	**23.5**	**38.5**	**4.0**	**3.2**	**2090000**	**378750**
TPF = 0 Max[3] :	**88535**		**19.2**	**7.90**	**45.1**	**52.3**	**4.4**	**3.3**	**4600000**	**850000**
TPF = 0 Min :	**80193**		**9.6**	**7.76**	**15.2**	**2.0**	**3.6**	**3.1**	**110000**	**51000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**14**								
TPF > 0 Average :	**96649**	**75950**	**82.70**	**7.35**	**124.2**	**43.2**	**4.5**	**3.6**	**4650000**	**685000**
TPF > 0 Max[3] :	**104998**	**93438**	**102.00**	**7.60**	**156.0**	**49.1**	**4.5**	**3.6**	**5900000**	**770000**
TPF > 0 Min :	**89227**	**11935**	**50.00**	**7.10**	**57.1**	**35.3**	**4.5**	**3.6**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**X**					

Appendix B4, cont'd

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
May 01, 2025	79101	0	9.6	7.80	19.8	40.6				
May 02, 2025	80010	0								
May 03, 2025	79620	0								
May 04, 2025	80920	0	9.6		13.6	40.1				
May 05, 2025	81505	0	8.8		14.9					
May 06, 2025	78567	0	8.8	7.70	14.3	39.6	3.4	3.0	220000	25000
May 07, 2025	80806	0	11.0		19.3					
May 08, 2025	78790	0	8.4		20.0	41.2				
May 09, 2025	80525	0								
May 10, 2025	78273	0								
May 11, 2025	81269	0	4.8		13.8	55.2				
May 12, 2025	79999	0	6.4		13.8					
May 13, 2025	80496	0	10.4	8.00	15.2	44.9			230000	17000
May 14, 2025	79026	0	17.4		20.9					
May 15, 2025	83883	0	19.6		27.0	48.1				
May 16, 2025	83701	0								
May 17, 2025	86443	0								
May 18, 2025	78628	0	11.2		8.6	38.2				
May 19, 2025	89107	0	14.2		12.6					
May 20, 2025	81381	0	12.8		11.1	42.4	4.3	4.2	120000	23000
May 21, 2025	79554	0	12.2		13.8					
May 22, 2025	79420	0	13.0	7.90	16.2	40.6	5.3	4.0	14000	12000
May 23, 2025	78457	0								
May 24, 2025	77627	0								
May 25, 2025	78977	0	5.2		9.4	43.5				
May 26, 2025	77929	0	9.0		5.6					
May 27, 2025	75375	0	12.6		10.6	41.8			91000	18000
May 28, 2025	77031	0	8.4	7.94	10.3				15000	13000
May 29, 2025	80731	0	5.8	7.90	10.0	35.1				
May 30, 2025	76702	0								
May 31, 2025	80947	0								
Monthly Total :	**2484800**	**0**								
Monthly Average :	**80155**	**0**	**10.4**	**7.87**	**14.3**	**42.4**	**4.3**	**3.7**	**115000**	**18000**
Monthly Max :	**89107**	**0**	**19.6**	**8.00**	**27.0**	**55.2**	**5.3**	**4.2**	**230000**	**25000**
Monthly Min :	**75375**	**0**	**4.8**	**7.70**	**5.6**	**35.1**	**3.4**	**3.0**	**14000**	**12000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**Y**								
TPF = 0 Average :	**80155**		**10.4**	**7.87**	**14.3**	**42.4**	**4.3**	**3.7**	**115000**	**18000**
TPF = 0 Max[3] :	**89107**		**19.6**	**8.00**	**27.0**	**55.2**	**5.3**	**4.2**	**230000**	**25000**
TPF = 0 Min :	**75375**		**4.8**	**7.70**	**5.6**	**35.1**	**3.4**	**3.0**	**14000**	**12000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**0**								
TPF > 0 Average :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Jun 01, 2025	78284	0	7.0		10.6	49.1				
Jun 02, 2025	79068	0	8.6		13.7					
Jun 03, 2025	77252	0	11.2	7.90	13.7	45.7	4.2	4.1	500000	46000
Jun 04, 2025	77150	0	7.4		10.8					
Jun 05, 2025	77221	0	9.0		15.2	41.3				
Jun 06, 2025	77520	0								
Jun 07, 2025	75868	0								
Jun 08, 2025	77365	0	5.8		5.7	41.1				
Jun 09, 2025	80079	0	11.0		7.6					
Jun 10, 2025	80243	0	11.0	8.00	12.6	54.2			10000000	140000
Jun 11, 2025	76920	0	13.0		10.9					
Jun 12, 2025	73852	0	6.8		6.9	37.3				
Jun 13, 2025	76667	0								
Jun 14, 2025	76297	0								
Jun 15, 2025	79287	0	9.0		7.3	43.7				
Jun 16, 2025	81539	0	13.4		12.9					
Jun 17, 2025	77987	0	14.6	7.90	10.3	38.9	3.9	3.8	2400000	140000
Jun 18, 2025	76245	0	8.8		10.4			3.8		
Jun 19, 2025	76565	0	14.6		12.9	34.8				
Jun 20, 2025	79441	0								
Jun 21, 2025	111457	0								
Jun 22, 2025	81670	0	8.0		10.6	40.1				
Jun 23, 2025	80698	0	14.2		14.2					
Jun 24, 2025	79651	0	18.4	7.72	19.1	33.9	4.5	3.5	2100000	280000
Jun 25, 2025	81870	0	24.4		19.0					
Jun 26, 2025	84314	0	16.8	7.90	19.2	49.3				
Jun 27, 2025	79847	0								
Jun 28, 2025	76340	0								
Jun 29, 2025	76333	0	12.6		10.2	38.0				
Jun 30, 2025	77417	0	11.2		12.0					
Monthly Total :	**2384447**	**0**								
Monthly Average :	**79482**	**0**	**11.7**	**7.88**	**12.1**	**42.1**	**4.2**	**3.8**	**3750000**	**151500**
Monthly Max :	**111457**	**0**	**24.4**	**8.00**	**19.2**	**54.2**	**4.5**	**4.1**	**10000000**	**280000**
Monthly Min :	**73852**	**0**	**5.8**	**7.72**	**5.7**	**33.9**	**3.9**	**3.5**	**500000**	**46000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**Y**								
TPF = 0 Average :	**79482**		**11.7**	**7.88**	**12.1**	**42.1**	**4.2**	**3.8**	**3750000**	**151500**
TPF = 0 Max[3] :	**111457**		**24.4**	**8.00**	**19.2**	**54.2**	**4.5**	**4.1**	**10000000**	**280000**
TPF = 0 Min :	**73852**		**5.8**	**7.72**	**5.7**	**33.9**	**3.9**	**3.5**	**500000**	**46000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**0**								
TPF > 0 Average :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Appendix B4, cont'd

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Jul 01, 2025	76968	0	12.0		13.5	41.5				
Jul 02, 2025	80063	0	11.6		11.9				1100000	120000
Jul 03, 2025	76531	0	19.0	7.70	23.6	41.7				
Jul 04, 2025	76620	0								
Jul 05, 2025	85535	0								
Jul 06, 2025	76826	0	9.0	7.80	9.3	34.3				
Jul 07, 2025	78388	0	11.7		12.2					
Jul 08, 2025	78551	0	10.8		11.0	33.3	3.8	3.6	810000	86000
Jul 09, 2025	78338	0	8.8		8.7					
Jul 10, 2025	76324	0	9.0		12.6	34.2				
Jul 11, 2025	75936	0								
Jul 12, 2025	74309	0								
Jul 13, 2025	76146	0	5.4		5.7	30.6				
Jul 14, 2025	77553	0	5.4		6.5					
Jul 15, 2025	77401	0	5.8	7.80	7.1	34.2			430000	41000
Jul 16, 2025	78807	0	5.0	8.07	8.6	1.9	4.4	3.4	910000	110000
Jul 17, 2025	78485	0	5.4		10.8	51.9				
Jul 18, 2025	75384	0								
Jul 19, 2025	75269	0								
Jul 20, 2025	77226	0	3.8		9.9	41.7				
Jul 21, 2025	79371	0	8.0		11.1					
Jul 22, 2025	78570	0	6.8		10.9	44.4	3.7	3.3	210000	23000
Jul 23, 2025	76998	0	5.8		10.5					
Jul 24, 2025	76619	0	5.6	7.90	12.6	38.0				
Jul 25, 2025	76063	0								
Jul 26, 2025	73945	0								
Jul 27, 2025	76206	0	4.2		7.5	34.9				
Jul 28, 2025	75803	0	6.2		10.7					
Jul 29, 2025	77035	0	7.8	7.80	11.7	38.0			1100000	140000
Jul 30, 2025	76735	0	4.6		12.8					
Jul 31, 2025	76709	0	6.4		10.3	44.0				
Monthly Total :	**2394714**	**0**								
Monthly Average :	**77249**	**0**	**7.7**	**7.85**	**10.9**	**36.3**	**4.0**	**3.4**	**760000**	**86667**
Monthly Max :	**85535**	**0**	**19.0**	**8.07**	**23.6**	**51.9**	**4.4**	**3.6**	**1100000**	**140000**
Monthly Min :	**73945**	**0**	**3.8**	**7.70**	**5.7**	**1.9**	**3.7**	**3.3**	**210000**	**23000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**Y**								
TPF = 0 Average :	**77249**		**7.7**	**7.85**	**10.9**	**36.3**	**4.0**	**3.4**	**760000**	**86667**
TPF = 0 Max[3] :	**85535**		**19.0**	**8.07**	**23.6**	**51.9**	**4.4**	**3.6**	**1100000**	**140000**
TPF = 0 Min :	**73945**		**3.8**	**7.70**	**5.7**	**1.9**	**3.7**	**3.3**	**210000**	**23000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**X**					
TPF > 0 # of Days[4] :		**0**								
TPF > 0 Average :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Aug 01, 2025	75126	0								
Aug 02, 2025	72590	0								
Aug 03, 2025	72890	0	6.2		8.2	33.2				
Aug 04, 2025	77120	0	4.0		8.3					
Aug 05, 2025	76463	0	4.8	7.80	9.8	41.3	4.4	4.4	85000	22000
Aug 06, 2025	78540	0	5.0		7.6					
Aug 07, 2025	76315	0	4.2		7.4	28.4				
Aug 08, 2025	75607	0								
Aug 09, 2025	74540	0								
Aug 10, 2025	75566	0	8.0	7.70	8.4	29.4				
Aug 11, 2025	76652	0	6.6		8.6				2200000	100000
Aug 12, 2025	77292	0	9.6		11.9	34.3				
Aug 13, 2025	76278	0	10.6		12.4					
Aug 14, 2025	78778	0	9.2		13.8	42.4				
Aug 15, 2025	96064	0								
Aug 16, 2025	85617	0								
Aug 17, 2025	79995	0	8.4	7.80	9.2	43.7				
Aug 18, 2025	79085	0	9.6		10.8					
Aug 19, 2025	77318	0	10.4		10.3	34.2	4.0	4.0	290000	39000
Aug 20, 2025	77975	0	11.4		9.0					
Aug 21, 2025	77466	0	6.4		8.9	44.8				
Aug 22, 2025	75419	0								
Aug 23, 2025	74158	0								
Aug 24, 2025	77273	0	8.2	7.90	14.2	41.1				
Aug 25, 2025	79178	0	6.0		11.2					
Aug 26, 2025	82086	0	14.6		14.2	38.4			330000	49000
Aug 27, 2025	77023	0	8.4	7.85	10.1		4.5	3.6	99000	43000
Aug 28, 2025	78118	0	7.2		10.0	31.9				
Aug 29, 2025	78616	0								
Aug 30, 2025	78616	0								
Aug 31, 2025	75305	0	5.8		6.1	33.8				
Monthly Total :	**2413069**	**0**								
Monthly Average :	**77841**	**0**	**7.8**	**7.81**	**10.0**	**36.7**	**4.3**	**4.0**	**600800**	**50600**
Monthly Max :	**96064**	**0**	**14.6**	**7.90**	**14.2**	**44.8**	**4.5**	**4.4**	**2200000**	**100000**
Monthly Min :	**72590**	**0**	**4.0**	**7.70**	**6.1**	**28.4**	**4.0**	**3.6**	**85000**	**22000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**Y**								
TPF = 0 Average :	**77841**		**7.8**	**7.81**	**10.0**	**36.7**	**4.3**	**4.0**	**600800**	**50600**
TPF = 0 Max[3] :	**96064**		**14.6**	**7.90**	**14.2**	**44.8**	**4.5**	**4.4**	**2200000**	**100000**
TPF = 0 Min :	**72590**		**4.0**	**7.70**	**6.1**	**28.4**	**4.0**	**3.6**	**85000**	**22000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**X**					
TPF > 0 # of Days[4] :		**0**								
TPF > 0 Average :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**0**	**0**	**0.00**	**0.00**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Appendix B4, cont'd

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Sep 01, 2025	81175	0	7.8		9.5					
Sep 02, 2025	80176	0	7.6		8.3	32.7			250000	25000
Sep 03, 2025	80177	0	7.0		8.4					
Sep 04, 2025	79307	0	8.0	7.80	10.2	32.0				
Sep 05, 2025	78256	0								
Sep 06, 2025	78478	0								
Sep 07, 2025	81819	0	6.8		7.1	37.1				
Sep 08, 2025	79673	0	8.2		9.1					
Sep 09, 2025	78860	0	7.6		7.6	33.3	3.9	3.8	120000	7500
Sep 10, 2025	79205	0	5.4		6.2					
Sep 11, 2025	78384	0	6.6	7.80	9.5	48.5				
Sep 12, 2025	78394	0								
Sep 13, 2025	78197	0								
Sep 14, 2025	83300	0	7.2		11.8	35.3				
Sep 15, 2025	79174	0	9.8		12.6					
Sep 16, 2025	78616	0	10.4		16.8	40.4			970000	97000
Sep 17, 2025	79355	0	9.8		16.4					
Sep 18, 2025	78578	0	19.4	7.90	25.0	49.6	5.3	4.3	90000	15000
Sep 19, 2025	77498	0								
Sep 20, 2025	77498	0								
Sep 21, 2025	91902	0	9.4		11.0	37.8				
Sep 22, 2025	80418	0	12.8		12.6					
Sep 23, 2025	77699	0	11.0		11.4	38.7	3.8	3.7	1100000	92000
Sep 24, 2025	77897	0	11.6		11.9					
Sep 25, 2025	77456	0	10.2	7.70	11.0	41.5				
Sep 26, 2025	77014	0								
Sep 27, 2025	76290	0								
Sep 28, 2025	78249	0	8.8		8.4	36.6				
Sep 29, 2025	84902	0	15.0		11.7					
Sep 30, 2025	80539	0	8.2		10.9	40.1			950000	89000
Monthly Total :	**2388486**	**0**								
Monthly Average :	**79616**	**0**	**9.5**	**7.80**	**11.2**	**38.7**	**4.3**	**3.9**	**580000**	**54250**
Monthly Max :	**91902**	**0**	**19.4**	**7.90**	**25.0**	**49.6**	**5.3**	**4.3**	**1100000**	**97000**
Monthly Min :	**76290**	**0**	**5.4**	**7.70**	**6.2**	**32.0**	**3.8**	**3.7**	**90000**	**7500**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**79737**		**9.4**	**7.83**	**11.3**	**38.5**	**4.3**	**3.9**	**580000**	**54250**
TPF = 0 Max[3] :	**91902**		**19.4**	**7.90**	**25.0**	**49.6**	**5.3**	**4.3**	**1100000**	**97000**
TPF = 0 Min :	**76290**		**5.4**	**7.80**	**6.2**	**32.0**	**3.8**	**3.7**	**90000**	**7500**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**X**					
TPF > 0 # of Days[4] :		**2**								
TPF > 0 Average :	**77925**	**0**	**10.20**	**7.70**	**11.0**	**41.5**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**78394**	**0**	**10.20**	**7.70**	**11.0**	**41.5**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**77456**	**0**	**10.20**	**7.70**	**11.0**	**41.5**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Oct 01, 2025	78900	0	7.8		9.8					
Oct 02, 2025	77505	0	7.0	7.80	10.6	37.4				
Oct 03, 2025	76589	0								
Oct 04, 2025	78514	0								
Oct 05, 2025	79789	0	6.0	7.80	11.0	36.6				
Oct 06, 2025	77797	0	10.8		12.8					
Oct 07, 2025	78031	0	7.6		10.9	41.0	4.4	4.5	1300000	200000
Oct 08, 2025	78051	0	8.2		14.7					
Oct 09, 2025	78364	0	7.2		13.7	38.8				
Oct 10, 2025	80004	0								
Oct 11, 2025	83333	0								
Oct 12, 2025	81897	0	4.2	7.70	8.8	42.3				
Oct 13, 2025	80202	0	4.8		10.3					
Oct 14, 2025	80562	0	9.2		13.3	42.1			600000	110000
Oct 15, 2025	80974	0	6.6		12.6					
Oct 16, 2025	77252	0	6.2		11.7	48.7				
Oct 17, 2025	76130	0								
Oct 18, 2025	108360	799								
Oct 19, 2025	108548	0	9.6		7.7	30.4				
Oct 20, 2025	86631	0	4.8		7.7					
Oct 21, 2025	80480	0	3.8	7.70	7.2	36.5	3.4	3.1	70000	11000
Oct 22, 2025	80478	0	5.8		10.0					
Oct 23, 2025	82584	0	6.8		12.9	55.8				
Oct 24, 2025	93936	0								
Oct 25, 2025	83764	0								
Oct 26, 2025	101499	0	7.4		9.2	33.8				
Oct 27, 2025	90500	0	6.8		8.9					
Oct 28, 2025	94700	600	14.0	8.10	17.4	47.3			710000	75000
Oct 29, 2025	95500	0	5.0		5.8					
Oct 30, 2025	85100	0	7.2	7.81	15.6	36.0	2.6	2.3	83000	29000
Oct 31, 2025	104800	2200								
Monthly Total :	**2640774**	**3599**								
Monthly Average :	**85186**	**116**	**7.1**	**7.82**	**11.0**	**40.5**	**3.4**	**3.3**	**552600**	**85000**
Monthly Max :	**108548**	**2200**	**14.0**	**8.10**	**17.4**	**55.8**	**4.4**	**4.5**	**1300000**	**200000**
Monthly Min :	**76130**	**0**	**3.8**	**7.70**	**5.8**	**30.4**	**2.6**	**2.3**	**70000**	**11000**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**83318**		**6.8**	**7.76**	**10.7**	**40.0**	**3.4**	**3.3**	**513250**	**87500**
TPF = 0 Max[3] :	**108548**		**10.8**	**7.81**	**15.6**	**55.8**	**4.4**	**4.5**	**1300000**	**200000**
TPF = 0 Min :	**76130**		**3.8**	**7.70**	**5.8**	**30.4**	**2.6**	**2.3**	**70000**	**11000**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**X**					
TPF > 0 # of Days[4] :		**3**								
TPF > 0 Average :	**102620**	**1200**	**14.00**	**8.10**	**17.4**	**47.3**	**0.0**	**0.0**	**710000**	**75000**
TPF > 0 Max[3] :	**108360**	**2200**	**14.00**	**8.10**	**17.4**	**47.3**	**0.0**	**0.0**	**710000**	**75000**
TPF > 0 Min :	**94700**	**600**	**14.00**	**8.10**	**17.4**	**47.3**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Appendix B4, cont'd

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Nov 01, 2025	161200	12400								
Nov 02, 2025	108300	0	6.0		3.7	24.8				
Nov 03, 2025	94400	0	6.4		7.7					
Nov 04, 2025	88100	0	6.2	7.60	7.9	37.5	3.4	3.2	75000	7300
Nov 05, 2025	88000	0	4.4		6.5					
Nov 06, 2025	119400	30	13.6		17.1	35.6				
Nov 07, 2025	99000	0								
Nov 08, 2025	91000	0								
Nov 09, 2025	89500	0	5.0		6.3	30.3				
Nov 10, 2025	92110	0	4.4		6.2					
Nov 11, 2025	86800	0	6.8	7.60	9.8	41.7				
Nov 12, 2025	83660	0	5.6		5.9				67000	11000
Nov 13, 2025	102920	0	17.8		18.3	32.5				
Nov 14, 2025	94800	0								
Nov 15, 2025	102760	0								
Nov 16, 2025	93910	0	6.4		7.6	26.2				
Nov 17, 2025	90850	0	9.4		9.2					
Nov 18, 2025	88160	0	7.4		11.5	34.2	3.9	3.5	720000	160000
Nov 19, 2025	88830	0	9.0		13.0					
Nov 20, 2025	86790	0	8.8	7.92	10.8	48.0	5.3	3.8	490000	110000
Nov 21, 2025	85890	0								
Nov 22, 2025	85890	0								
Nov 23, 2025	106560	0	6.8		9.9	27.4				
Nov 24, 2025	87700	0	7.0		9.2					
Nov 25, 2025	112440	0	22.0		13.8	27.5			270000	62000
Nov 26, 2025	102250	0	6.2		7.6					
Nov 27, 2025	125180	0	10.8	7.40	11.4	31.5				
Nov 28, 2025	102040	0								
Nov 29, 2025	95150	0								
Nov 30, 2025	93660	0	5.2	7.50	7.1	41.6				
Monthly Total :	**2947250**	**12430**								
Monthly Average :	**98242**	**414**	**8.3**	**7.60**	**9.5**	**33.8**	**4.2**	**3.5**	**324400**	**70060**
Monthly Max :	**161200**	**12400**	**22.0**	**7.92**	**18.3**	**48.0**	**5.3**	**3.8**	**720000**	**160000**
Monthly Min :	**83660**	**0**	**4.4**	**7.40**	**3.7**	**24.8**	**3.4**	**3.2**	**67000**	**7300**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**95238**		**8.1**	**7.60**	**9.2**	**33.6**	**4.2**	**3.5**	**324400**	**70060**
TPF = 0 Max[3] :	**125180**		**22.0**	**7.92**	**18.3**	**48.0**	**5.3**	**3.8**	**720000**	**160000**
TPF = 0 Min :	**83660**		**4.4**	**7.40**	**3.7**	**24.8**	**3.4**	**3.2**	**67000**	**7300**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**Y**	**Y**	**Y**					
TPF > 0 # of Days[4] :		**2**								
TPF > 0 Average :	**140300**	**6215**	**13.60**	**0.00**	**17.1**	**35.6**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Max[3] :	**161200**	**12400**	**13.60**	**0.00**	**17.1**	**35.6**	**0.0**	**0.0**	**0**	**0**
TPF > 0 Min :	**119400**	**30**	**13.60**	**0.00**	**17.1**	**35.6**	**0.0**	**0.0**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Date ↓	Total Daily Flow [1] m³/d	Total Primary Flow [2] m³/d	TSS [3] mg/L	pH	CBOD [3] mg/L	NH3 mg/L	Total Phosphate mg/L	Orthophosphate mg/L	FC CFU/100mL	Enterococci CFU/100mL
Dec 01, 2025	97510	0	10.8		13.9					
Dec 02, 2025	92990	0	11.0		15.0	35.5	1.3	3.2	750000	130000
Dec 03, 2025	92630	0	6.6		10.1					
Dec 04, 2025	120690	0	14.2		15.5	38.2				
Dec 05, 2025	114230	0								
Dec 06, 2025	105000	0								
Dec 07, 2025	105490	0	9.2	7.30	12.2	29.2				
Dec 08, 2025	176650	23800	23.2		18.8					
Dec 09, 2025	158140	7430	9.2		8.6	19.2	3.7	1.0	100000	22000
Dec 10, 2025	297780	109560	25.4	7.94	12.2	1.2	1.3	0.9	39000	6500
Dec 11, 2025	225160	170820	34.7		31.7	15.9				
Dec 12, 2025	166460	40260	27.2		20.0					
Dec 13, 2025	134160	0								
Dec 14, 2025	133130	0	16.0	7.60	8.3	29.1				
Dec 15, 2025	173210	23800	15.5		11.1					
Dec 16, 2025	224730	58900	18.6		12.8	18.5			1100000	150000
Dec 17, 2025	288470	107360	12.2		9.5					
Dec 18, 2025	207660	8740	14.8		10.5	15.1				
Dec 19, 2025	170760	160								
Dec 20, 2025	191730	20640								
Dec 21, 2025	188450	1470	14.0	7.50	9.6	19.3				
Dec 22, 2025	163240	770	8.0		9.5	23.2				
Dec 23, 2025	146930	0	9.6		9.9	23.2			91000	29000
Dec 24, 2025	137120	10	3.0							
Dec 25, 2025	122490	0	5.0							
Dec 26, 2025	127040	0								
Dec 27, 2025	116710	0								
Dec 28, 2025	111400	0	7.2		7.5	27.1				
Dec 29, 2025	106930	0	5.6		8.2					
Dec 30, 2025	105590	0	6.8	7.50	10.1	32.6			54000	6200
Dec 31, 2025	103520	0	5.8		9.9					
Monthly Total :	**4706000**	**573720**								
Monthly Average :	**151806**	**18507**	**13.1**	**7.57**	**12.5**	**23.4**	**2.1**	**1.7**	**355667**	**57283**
Monthly Max :	**297780**	**170820**	**34.7**	**7.94**	**31.7**	**38.2**	**3.7**	**3.2**	**1100000**	**150000**
Monthly Min :	**92630**	**0**	**3.0**	**7.30**	**7.5**	**1.2**	**1.3**	**0.9**	**39000**	**6200**
Provincial Limits:	**432000**	**Footnote 2**								
Compliance Status :	**Y**	**X**								
TPF = 0 Average :	**113908**		**9.0**	**7.47**	**11.0**	**30.7**	**1.3**	**3.2**	**298333**	**55067**
TPF = 0 Max[3] :	**146930**		**16.0**	**7.60**	**15.5**	**38.2**	**1.3**	**3.2**	**750000**	**130000**
TPF = 0 Min :	**92630**		**5.0**	**7.30**	**7.5**	**23.2**	**1.3**	**3.2**	**54000**	**6200**
Provincial Limits:			**Max 25/Avg 10**	**6 - 9**	**Max 25/Avg 10**					
Compliance Status :			**X**	**Y**	**X**					
TPF > 0 # of Days[4] :		**14**								
TPF > 0 Average :	**197826**	**40980**	**17.15**	**7.72**	**14.0**	**16.1**	**2.5**	**0.9**	**413000**	**59500**
TPF > 0 Max[3] :	**297780**	**170820**	**34.70**	**7.94**	**31.7**	**23.2**	**3.7**	**1.0**	**1100000**	**150000**
TPF > 0 Min :	**137120**	**10**	**3.00**	**7.50**	**8.6**	**1.2**	**1.3**	**0.9**	**0**	**0**
Provincial Limits:			**Max 130**		**Max 130**					
Compliance Status :			**Y**		**Y**					

Notes:
1 Total Daily Flow represents all effluent being discharged to the marine receiving environment and consists of full tertiary effluent or blended tertiary + primary effluent. Blended effluent is typically only discharged during wet weather events when the treatment capacity of the tertiary portion of the system (i.e. 216,000 m^3/day) is exceeded. The provincial limit for Total Daily Flow is a maximum of 432,000 m^3/day.

2 Total Primary Flow (TPF) represents the portion of the Total Daily Flow that has received only primary treatment. This primary effluent is blended with tertiary effluent prior to discharge. As above, this typically only occurs during wet weather events. TPF is deemed noncompliant if it occurs on a day when Total Daily Flow is less than the tertiary treatment capacity of 216,000 m^3/day.

3 Provincial limits for pH, TSS, and CBOD are contingent upon whether tertiary or blended tertiary + primary effluent is being discharged. On days when only tertiary effluent is discharged, the compliance limits are 25 mg/L maximum and 10 mg/L average for TSS and CBOD, and pH within a range of 6 9. On days when blended tertiary + primary effluent is discharged, the compliance limit is 130 mg/L maximum for TSS and CBOD.

4 The provincial limit for blended tertiary + primary effluent discharge is 70 days per calendar year.

Yellow shading highlights blended flow volumes and permit exceedances.

Appendix B5 Frequency of Detection, Loadings and Percent Removal of Substances in McLoughlin Influent and Final Effluent

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Alkalinity	TOT	mg/L	12	100%	240.92	8375547	12	100%	191.52	6483628	23%
Alkalinity - Bicarbonate	TOT	mg/L	11	100%	293.56	9943709	11	100%	236.36	7799233	22%
Alkalinity - Carbonate	TOT	mg/L	11	0%	---	---	11	0%	---	---	---
Alkalinity - Hydroxide	TOT	mg/L	11	0%	---	---	11	0%	---	---	---
Alkalinity - Phenolphthalein - Ph 8.3	TOT	mg/L	11	0%	---	---	11	0%	---	---	---
Alkalinity - Total - Ph 4.5	TOT	mg/L	11	100%	239.39	8113399	11	100%	192.73	6337673	22%
BOD	TOT	mg/L	12	100%	298.08	10206057	12	100%	28.11	972660	90%
CBOD	TOT	mg/L	12	100%	194.47	6597921	12	100%	17.58	605520	91%
Chloride	DIS	mg/L	12	100%	71.23	2445330	12	100%	74.58	2530216	-3%
COD	TOT	mg/L	12	100%	699.35	23802968	12	100%	104.81	3588251	85%
H2S	TOT	mg/L	6	100%	0.74	23571	7	86%	0.053	1553	93%
Hardness (as CaCO3)	DIS	mg/L	12	100%	80.81	2932883	12	100%	79.16	2793887	5%
Hardness (as CaCO3)	TOT	mg/L	12	100%	90.43	3253741	12	100%	79.33	2810960	14%
N - Nh3 (As N)	TOT	mg/L	12	100%	42.06	1422761	12	100%	34.30	1146190	19%
N - Nh3 (As N)-Unionized	TOT	mg/L as N	---	---	---	---	12	100%	0.55	17574	---
N - No2 (As N)	DIS	mg/L	12	17%	---	---	12	100%	0.97	31353	---
N - No3 (As N)	DIS	mg/L	12	17%	---	---	12	100%	3.42	121800	---
N - No3 (As N)	TOT	mg/L	---	---	---	---	8	100%	3.49	115004	---
N - No3 + No2 (As N)	DIS	mg/L	12	17%	---	---	12	100%	4.61	158910	---
N - Tkn (As N)	TOT	mg/L	12	100%	62.92	2165687	12	100%	38.04	1278442	41%
N - Total (As N)	TOT	mg/L	12	100%	59.76	2033207	12	100%	41.33	1380476	32%
Oil & Grease, Mineral	TOT	mg/L	12	25%	---	---	12	0%	---	---	---
Oil & grease, total	TOT	mg/L	12	100%	20.94	688291	12	42%	---	---	100%
Organic Carbon	TOT	mg/L	12	100%	131.46	4402928	12	100%	24.0	807687	82%
P - Po4 - Ortho (As P)	DIS	mg/L	12	100%	4.21	143764	12	100%	3.28	108859	24%
P - Po4 - Total (As P)	TOT	mg/L	8	100%	7.31	251079	12	100%	3.75	126176	50%
SCBOD	DIS	mg/L	12	100%	68.18	2310072	12	100%	9.69	331041	86%
Soluble Chemical Oxygen Demand	DIS	mg/L	12	100%	211.21	7220171	12	100%	81.19	2768717	62%
Sulfide	TOT	mg/L	11	100%	0.65	20732	12	75%	0.042	1182	94%
Sulphate	DIS	mg/L	12	100%	25.10	907996	12	100%	24.92	877050	3%
Total/SAD Cyanide	TOT	mg/L	12	83%	0.0059	171.50	12	67%	0.0033	76.60	55%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
TSS	TOT	mg/L	12	100%	332.86	11290170	12	100%	13.89	486968	96%
WAD Cyanide	TOT	mg/L	12	67%	0.0036	101.47	12	25%	---	---	100%
Tetrabromomethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
4-Methyl-2-Pentanone	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Dimethyl Ketone	TOT	µg/L	12	100%	103.91	3568	12	17%	---	---	100%
Endrin Ketone	TOT	ng/L	4	50%	0.0137	0.00	4	25%	---	---	100%
Isophorone	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
Aluminum	DIS	µg/L	12	100%	22.0235	766.99	12	100%	14.07	485.12	37%
Aluminum	TOT	µg/L	12	100%	193.9712	6785.14	12	100%	27.72	996.58	85%
Antimony	DIS	µg/L	12	100%	0.3457	12.60	12	100%	0.297	10.57	16%
Antimony	TOT	µg/L	12	100%	0.3873	14.01	12	100%	0.307	10.96	22%
Arsenic	DIS	µg/L	12	100%	0.6240	23.07	12	100%	0.509	17.96	22%
Arsenic	TOT	µg/L	12	100%	0.7275	26.56	12	100%	0.515	18.25	31%
Barium	DIS	µg/L	12	100%	5.6247	202.87	12	100%	2.550	90.25	56%
Barium	TOT	µg/L	12	100%	18.19	639.49	12	100%	4.165	148.97	77%
Beryllium	DIS	µg/L	12	0%	---	---	12	0%	---	---	---
Beryllium	TOT	µg/L	12	17%	---	---	12	0%	---	---	---
Bismuth	DIS	µg/L	12	100%	0.1823	6.24	12	100%	0.1670	5.54	11%
Boron	DIS	µg/L	12	100%	143.46	5035.51	12	100%	149.25	5125.70	-2%
Cadmium	DIS	µg/L	12	100%	0.0313	1.07	12	100%	0.0149	0.51	52%
Cadmium	TOT	µg/L	12	100%	0.1507	5.09	12	100%	0.0269	0.94	81%
Calcium	DIS	mg/L	12	100%	20.02	731133	12	100%	19.70	697139	5%
Calcium	TOT	mg/L	12	100%	23.04	831558	12	100%	19.78	703298	15%
Chromium	DIS	µg/L	12	100%	1.3839	49.80	12	100%	1.1583	40.53	19%
Chromium	TOT	µg/L	12	100%	2.3717	84.06	12	100%	1.4625	52.19	38%
Chromium III	TOT	mg/L	12	75%	0.0022	70.93	12	58%	0.0014	37.09	48%
Chromium VI	TOT	mg/L	12	25%	---	---	12	33%	---	---	---
Cobalt	DIS	µg/L	12	100%	0.5258	18.80	12	100%	0.5619	19.39	-3%
Cobalt	TOT	µg/L	12	100%	0.7704	27.16	12	100%	0.5911	20.72	24%
Copper	DIS	µg/L	12	100%	18.02	613.89	12	100%	12.55	423.07	31%
Copper	TOT	µg/L	12	100%	45.20	1523.21	12	100%	16.10	543.03	64%
Dibutyltin Dichloride	TOT	µg/L	3	33%	---	---	3	33%	---	---	---
Iron	DIS	µg/L	12	100%	659.02	21985.88	12	100%	390.67	13125	40%
Iron	TOT	µg/L	12	100%	1982.08	66923	12	100%	689.00	24027	64%
Lead	DIS	µg/L	12	100%	0.3826	13.13	12	100%	0.2658	8.94	32%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Lead	TOT	µg/L	12	100%	2.39	80.87	12	100%	0.4532	15.58	81%
Lithium	DIS	µg/L	12	100%	2.42	83.22	12	100%	2.44	82.21	1%
Magnesium	DIS	mg/L	12	100%	7.48	268446	12	100%	7.26	255021	5%
Magnesium	TOT	mg/L	12	100%	8.00	286520	12	100%	7.26	255759	11%
Manganese	DIS	µg/L	12	100%	38.80	1372.23	12	100%	40.18	1364.76	1%
Manganese	TOT	µg/L	12	100%	56.52	1991.87	12	100%	45.84	1610.28	19%
Mercury	DIS	µg/L	12	100%	0.0052	0.18	12	92%	0.0038	0.13	31%
Mercury	TOT	µg/L	12	100%	0.0358	1.17	12	100%	0.0069	0.23	80%
Methyl Mercury	TOT	ng/L	4	50%	0.2450	0.0075	4	0%	---	---	100%
Molybdenum	DIS	µg/L	12	100%	1.4168	51.61	12	100%	1.4416	51.61	0%
Molybdenum	TOT	µg/L	12	100%	1.6763	60.06	12	100%	1.4608	52.52	13%
Monobutyltin Trichloride	TOT	µg/L	3	100%	0.0329	1.52	3	100%	0.0401	1.45	5%
Nickel	DIS	µg/L	12	100%	2.6701	94.38	12	100%	3.2842	113.70	-20%
Nickel	TOT	µg/L	12	100%	3.4622	121.50	12	100%	3.2483	112.83	7%
Phosphorus	DIS	µg/L	12	100%	5339	178614	12	100%	3693.08	120502	33%
Phosphorus	TOT	µg/L	12	100%	7728	259546	12	100%	3903.33	127769	51%
Potassium	DIS	mg/L	12	100%	15.7403	535364	12	100%	15.2783	511461	4%
Potassium	TOT	mg/L	12	100%	15.9441	543387	12	100%	14.9725	502943	7%
Selenium	DIS	µg/L	12	100%	0.2080	7.48	12	100%	0.1636	5.67	24%
Selenium	TOT	µg/L	12	100%	0.3342	11.62	12	100%	0.1843	6.40	45%
Silicon	DIS	µg/L	12	100%	3771.28	137088	12	100%	3700.83	130900	5%
Silver	DIS	µg/L	12	100%	0.0534	1.84	12	100%	0.0326	1.10	40%
Silver	TOT	µg/L	12	100%	0.0927	3.26	12	100%	0.0509	1.73	47%
Sodium	DIS	mg/L	12	100%	53.51	1847681	12	100%	53.3167	1805109	2%
Sodium	TOT	mg/L	8	100%	52.30	1743515	8	100%	51.2125	1676907	4%
Strontium	DIS	µg/L	12	100%	84.97	3093	12	100%	78.4667	2787	10%
Sulfur	DIS	mg/L	12	92%	8.54	301512	12	100%	8.9333	314145	-4%
Sulfur	TOT	mg/L	8	100%	9.13	306500	8	100%	8.6125	283320	8%
Thallium	DIS	µg/L	12	8%	---	---	12	8%	---	---	---
Thallium	TOT	µg/L	12	100%	0.0047	0.16	12	8%	---	---	100%
Tin	DIS	µg/L	12	100%	1.0403	35.70	12	100%	0.6875	23.10	35%
Tin	TOT	µg/L	12	100%	0.949	32.21	12	100%	0.7042	24.03	25%
Titanium	DIS	µg/L	12	100%	2.11	75.20	12	100%	1.3208	45.68	39%
Tributyltin Chloride	TOT	µg/L	4	0%	---	---	4	0%	---	---	---
Uranium	DIS	µg/L	12	100%	0.0357	1.48	12	100%	0.0151	0.59	60%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Vanadium	DIS	µg/L	12	100%	0.6338	24.55	12	100%	0.5425	19.67	20%
Zinc	DIS	µg/L	12	100%	22.69	791.00	12	100%	26.98	920.89	-16%
Zinc	TOT	µg/L	12	100%	100.32	3382.82	12	100%	30.67	1048.16	69%
Zirconium	DIS	µg/L	7	100%	0.5214	19.61	7	100%	0.3514	12.92	34%
1,1,1,2-Tetrachloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,1,1-trichloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,1,2,2-tetrachloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,1,2-trichloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,1-dichloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,1-dichloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,2,3,4-Tetrachlorobenzene	TOT	ng/L	4	100%	0.0738	0.0025	4	100%	0.0383	0.0014	44%
1,2,3-Trichlorobenzene	TOT	ng/L	4	100%	0.1488	0.0057	4	100%	0.0915	0.0034	40%
1,2,4,5-/1,2,3,5-Tetrachlorobenzene	TOT	ng/L	4	100%	0.0448	0.0016	4	100%	0.0213	0.00081	50%
1,2,4-trichlorobenzene	TOT	µg/L	12	0%	---	---	11	0%	---	---	---
1,2-dibromoethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,2-dichlorobenzene	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
1,2-dichloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,2-dichloropropane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,2-diphenylhydrazine	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,3,5-Trichlorobenzene	TOT	ng/L	4	100%	0.0693	0.00260	4	100%	0.0403	0.00146	44%
1,3-dichlorobenzene	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
1,4-dichlorobenzene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
1,4-Dioxane	TOT	µg/L	4	0%	---	---	4	0%	---	---	---
1,7-Dimethylxanthine	TOT	ng/L	4	100%	31500	1114.52	4	100%	5757.50	233.31	79%
2,4-dinitrotoluene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2,6-dinitrotoluene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
3,3-dichlorobenzidine	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
4-Bromophenyl Phenyl Ether	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
4-Chlorophenyl Phenyl Ether	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Acrolein	TOT	µg/L	12	17%	---	---	12	0%	---	---	---
Acrylonitrile	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Alpha-Terpineol	TOT	µg/L	12	92%	9.95	308.92	12	0%	---	---	100%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Benzene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Bromodichloromethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Bromomethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Chlorobenzene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Chlorodibromomethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Chloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Chloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Chloromethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Cis-1,2-Dichloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
cis-1,3-dichloropropene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Delta-Hch Or Delta-Bhc	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Dibromomethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Dichlorodifluoromethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Dichloromethane	TOT	µg/L	11	9%	---	---	11	0%	---	---	---
Ethylbenzene	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
Hexachlorobutadiene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Hexachlorocyclopentadiene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Hexachloroethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
M & P Xylenes	TOT	µg/L	12	25%	---	---	12	17%	---	---	---
Methyl Ethyl Ketone	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Methyl Tertiary Butyl Ether	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Nitrobenzene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
N-nitrosodimethylamine	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
N-Nitrosodi-N-Propylamine	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
N-nitrosodiphenylamine	TOT	µg/L	11	0%	---	---	11	0%	---	---	---
O-Xylene	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
Pentachlorobenzene	TOT	ng/L	4	100%	0.0895	0.00319	4	100%	0.0420	0.00159	50%
Perfluorobutanoic acid	TOT	ng/L	4	100%	26.34	1.08	4	100%	22.78	0.91	16%
Styrene	TOT	µg/L	12	8%	---	---	12	0%	---	---	---
Tetrachloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Tetrachloromethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Toluene	TOT	µg/L	12	100%	1.6724	58.26	12	0%	---	---	100%
Trans-1,2-Dichloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
trans-1,3-dichloropropene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Trans-Chlordane	TOT	ng/L	4	100%	0.1628	0.00603	4	100%	0.0568	0.00210	65%
Trans-Nonachlor	TOT	ng/L	4	100%	0.1155	0.00427	4	100%	0.0370	0.00136	68%
Tribromomethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Trichloroethene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Trichlorofluoromethane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Trichloromethane	TOT	µg/L	12	100%	2.5056	87.50	12	42%	---	---	100%
Xylenes	TOT	µg/L	12	25%	---	---	12	17%	---	---	---
17 beta-Estradiol 3-benzoate	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Allyl Trenbolone	TOT	ng/L	3	0%	---	---	4	0%	---	---	---
Androstenedione	TOT	ng/L	4	100%	144.8	4.91	4	75%	6.73	0.195	96%
Androsterone	TOT	ng/L	2	50%	110.8	2.09	1	0%	---	---	100%
Desogestrel	TOT	ng/L	2	0%	---	---	2	0%	---	---	---
Mestranol	TOT	ng/L	3	33%	---	---	4	25%	---	---	---
Norethindrone	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
norgestrel	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
Progesterone	TOT	ng/L	4	75%	46.04	1.58	4	100%	2.5100	0.086	95%
Testosterone	TOT	ng/L	4	100%	69.38	2.34	4	25%	---	---	100%
Total Phenols	TOT	mg/L	12	92%	0.0367	1197.54	12	100%	0.00401	132.98	89%
2,4 + 2,5 Dichlorophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2,4,6-trichlorophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2,4-dimethylphenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2,4-dinitrophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2-Chlorophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2-Methyl-4,6-Dinitrophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2-Nitrophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
4-Chloro-3-Methylphenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Pentachlorophenol	TOT	µg/L	12	17%	---	---	12	0%	---	---	---
Phenol	TOT	µg/L	12	83%	8.75	267.56	12	0%	---	---	100%
1,2,3,4,6,7,8-HPCDD	TOT	pg/L	4	100%	36.86	0.0014	4	100%	6.39	0.00025	82%
1,2,3,4,6,7,8-HPCDF	TOT	pg/L	4	100%	1.79	0.000072	4	75%	0.422	0.000016	78%
1,2,3,4,7,8,9-HPCDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
1,2,3,4,7,8-HXCDD	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
1,2,3,4,7,8-HXCDF	TOT	pg/L	4	25%	---	---	4	0%	---	---	---

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
1,2,3,6,7,8-HXCDD	TOT	pg/L	4	100%	0.7963	0.000031	4	25%	---	---	100%
1,2,3,6,7,8-HXCDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
1,2,3,7,8,9-HXCDD	TOT	pg/L	4	75%	0.3978	0.000013	4	0%	---	---	100%
1,2,3,7,8,9-HXCDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
1,2,3,7,8-PECDD	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
1,2,3,7,8-PECDF	TOT	pg/L	4	100%	0.2955	0.000012	4	75%	0.2468	0.0000082	30%
17 alpha-Dihydroequilin	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
17 alpha-Estradiol	TOT	ng/L	4	0%	---	---	4	25%	---	---	---
17 alpha-Ethinyl-Estradiol	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
17 beta-Estradiol	TOT	ng/L	4	25%	---	---	4	25%	---	---	---
1-Methylphenanthrene	TOT	ng/L	4	100%	18.05	0.66	4	100%	2.56	0.103	84%
2,3,4,6,7,8-HXCDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
2,3,4,7,8-PECDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
2,3,5-trimethylnaphthalene	TOT	ng/L	4	100%	48.88	1.95	4	100%	5.72	0.25	87%
2,3,7,8-TCDD	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
2,3,7,8-TCDF	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
2,4-DDD	TOT	ng/L	4	100%	0.1655	0.00591	4	100%	0.0698	0.00255	57%
2,4-DDE	TOT	ng/L	4	75%	0.0155	0.00043	4	0%	---	---	100%
2,4-DDT	TOT	ng/L	4	100%	0.0948	0.0035	4	100%	0.036	0.0014	61%
2,6-dimethylnaphthalene	TOT	ng/L	4	100%	68.5250	2.93	4	100%	7.07	0.33	89%
2-Chloronaphthalene	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
2-Hydroxy-Ibuprofen	TOT	ng/L	4	100%	20425	753.57	4	100%	5253	197.23	74%
2-Methylnaphthalene	TOT	µg/L	12	100%	0.0748	2.65	12	67%	0.0119	0.32	88%
3:3 FTCA	TOT	ng/L	4	75%	2.58	0.091	4	50%	2.7775	0.07	26%
4,4-DDD	TOT	ng/L	4	100%	0.2750	0.0110	4	100%	0.0360	0.0014	88%
4,4-DDE	TOT	ng/L	4	100%	0.8478	0.0336	4	100%	0.2735	0.0118	65%
4,4-DDT	TOT	ng/L	4	100%	0.732	0.035	4	100%	0.1798	0.0072	80%
4:2 FTS	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
4-Nitrophenol	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
4-n-Octylphenol	TOT	ng/L	4	50%	4.19	0.088	4	50%	1.4325	0.0135	85%
4-Nonylphenol Diethoxylates	TOT	ng/L	4	75%	280.63	9.43	4	100%	197.70	7.00	26%
4-Nonylphenol Monoethoxylates	TOT	ng/L	4	100%	985.25	34.83	4	100%	678.50	23.26	33%
5:3 FTCA	TOT	ng/L	4	100%	323.75	11.58	4	100%	81.70	2.89	75%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
6:2 FTS	TOT	ng/L	4	100%	5.09	0.176	4	100%	3.81	0.14	20%
7:3 FTCA	TOT	ng/L	4	100%	29.63	0.997	4	0%	---	---	100%
8:2 FTS	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
ABHC	TOT	ng/L	4	75%	0.0301	0.000890	4	75%	0.0308	0.000933	-5%
Acenaphthene	TOT	µg/L	12	100%	0.1009	3.60	12	92%	0.0235	0.82	77%
Acenaphthylene	TOT	µg/L	12	67%	0.0251	0.600	12	8%	---	---	100%
Acetaminophen	TOT	ng/L	4	100%	106050	3890	4	100%	113.25	4.01	100%
ADONA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Aldrin	TOT	ng/L	4	100%	0.0400	0.00151	4	100%	0.0375	0.00134	11%
Alpha Chlordane	TOT	ng/L	4	100%	0.142	0.00543	4	100%	0.059	0.00215	60%
Alpha-Endosulfan	TOT	ng/L	4	75%	0.0201	0.000519	4	0%	---	---	100%
Anthracene	TOT	µg/L	12	92%	0.0291	0.94	12	33%	---	---	100%
Azithromycin	TOT	ng/L	4	100%	304.68	10.57	4	100%	213.85	7.35	30%
Benzo(B)Fluoranthene + Benzo(J)Fluoranthene	TOT	µg/L	12	75%	0.0317	0.93	12	17%	---	---	100%
Benzo(K)Fluoranthene	TOT	µg/L	12	67%	0.0191	0.49	12	8%	---	---	100%
Benzo[a]anthracene	TOT	µg/L	12	75%	0.0289	0.88	12	25%	---	---	100%
Benzo[a]pyrene	TOT	µg/L	12	83%	0.0439	1.31	12	67%	0.0078	0.22	83%
Benzo[b]fluoranthene	TOT	µg/L	12	75%	0.0252	0.72	12	17%	---	---	100%
Benzo[e]pyrene	TOT	ng/L	4	100%	21.86	0.75	4	100%	1.83	0.067	91%
Benzo[ghi]perylene	TOT	µg/L	12	42%	---	---	12	0%	---	---	---
Benzo[J,K]Fluoranthenes	TOT	ng/L	4	100%	23.87	0.81	4	100%	1.3255	0.0502	94%
Beta-Endosulfan	TOT	ng/L	4	75%	0.0169	0.000417	4	50%	0.0129	0.000313	25%
Beta-Hch Or Beta-Bhc	TOT	ng/L	4	100%	0.133	0.00485	4	100%	0.0993	0.00384	21%
Bis(2-Chloroethoxy)Methane	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Bis(2-Chloroethyl)Ether	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Bis(2-Chloroisopropyl)Ether	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Bis(2-Ethylhexyl)Phthalate	TOT	µg/L	12	92%	8.002	248.39	12	0%	---	---	100%
Bisphenol A	TOT	ng/L	4	100%	8781.25	378.14	4	100%	3438.25	147.20	61%
Butylbenzyl Phthalate	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Caffeine	TOT	ng/L	4	100%	71900	2560.18	4	100%	8515.00	327.86	87%
Carbadox	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Carbamazepine	TOT	ng/L	4	100%	531.25	18.05	4	100%	349.25	12.31	32%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Cefotaxime	TOT	ng/L	4	0%	---	---	4	25%	---	---	---
Chrysene	TOT	µg/L	12	83%	0.0498	1.58	12	42%	---	---	100%
Ciprofloxacin	TOT	ng/L	4	100%	318	12.5	4	100%	178	6.80	46%
Cis-Nonachlor	TOT	ng/L	4	100%	0.0190	0.00074	4	25%	---	---	100%
Clarithromycin	TOT	ng/L	4	100%	145.3	5.26	4	100%	121.55	4.54	14%
Clinafloxacin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Cloxacillin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Decachloro Biphenyl	TOT	pg/L	4	100%	21.92	0.00073	3	100%	4.24	0.00016	78%
Dehydronifedipine	TOT	ng/L	4	100%	3.95	0.17	4	100%	2.52	0.091	45%
dibenzo(a,h)anthracene	TOT	µg/L	12	33%	---	---	12	8%	---	---	---
Dibenzothiophene	TOT	ng/L	4	100%	27.60	0.96	4	100%	4.03	0.16	84%
Dichloro Biphenyls	TOT	pg/L	4	100%	493.75	0.018	4	100%	200.25	0.0080	56%
Dieldrin	TOT	ng/L	4	100%	0.5403	0.0216	4	100%	0.2020	0.00788	64%
Diethyl Phthalate	TOT	µg/L	12	100%	1.7354	58.63	12	58%	0.3192	7.84	87%
Digoxigenin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Digoxin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Diltiazem	TOT	ng/L	4	100%	231.25	8.14	4	100%	191.25	6.77	17%
Dimethyl Phthalate	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Di-N-Butyl Phthalate	TOT	µg/L	12	8%	---	---	12	8%	---	---	---
Di-N-Octyl Phthalate	TOT	µg/L	12	0%	---	---	12	0%	---	---	---
Diphenhydramine	TOT	ng/L	4	100%	760.00	27.07	4	100%	570.00	20.01	26%
Endosulfan Sulfate	TOT	ng/L	4	25%	---	---	4	50%	0.0112	0.000189	---
Endrin	TOT	ng/L	4	75%	0.0190	0.000468	4	0%	---	---	100%
Endrin Aldehyde	TOT	ng/L	4	100%	0.6418	0.0264	4	100%	0.1165	0.00445	83%
Enrofloxacin	TOT	ng/L	4	0%	---	---	4	75%	0.79	0.02	---
Equilenin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Equilin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Erythromycin-H2O	TOT	ng/L	4	75%	10.96	0.31	4	100%	10.33	0.39	-24%
Estriol	TOT	ng/L	4	100%	191.08	6.44	4	25%	---	---	100%
Estrone	TOT	ng/L	4	100%	49.30	1.84	4	75%	9.4450	0.27	86%
Flumequine	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Fluoranthene	TOT	µg/L	12	100%	0.1152	3.94	12	92%	0.0208	0.71	82%
Fluorene	TOT	µg/L	12	92%	0.0653	2.22	12	92%	0.0472	1.53	31%
Fluoxetine	TOT	ng/L	4	100%	44.48	1.58	4	100%	34.38	1.21	23%
Furosemide	TOT	ng/L	4	100%	670.00	22.87	4	100%	477.25	16.58	28%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Gemfibrozil	TOT	ng/L	4	75%	10.05	0.35	4	100%	11.00	0.37	-5%
Glipizide	TOT	ng/L	4	0%	---	---	4	25%	---	---	---
Glyburide	TOT	ng/L	4	50%	4.76	0.10	4	100%	4.06	0.13	-35%
HCH, Gamma	TOT	ng/L	4	100%	0.27	0.0087	4	100%	0.098	0.0033	62%
Heptachlor	TOT	ng/L	4	75%	0.011	0.00028	4	0%	---	---	100%
Heptachlor Epoxide	TOT	ng/L	4	100%	0.097	0.00449	4	100%	0.035	0.00153	66%
Heptachloro Biphenyls	TOT	pg/L	4	100%	322.00	0.012	4	100%	74.50	0.0029	76%
Hepta-Dioxins	TOT	pg/L	4	100%	81.18	0.0031	4	100%	14.29	0.0006	82%
Hepta-Furans	TOT	pg/L	4	100%	4.70	0.00019	4	75%	1.013	0.000041	79%
Hexachloro Biphenyls	TOT	pg/L	4	100%	761.75	0.028	4	100%	207.75	0.0080	72%
Hexachlorobenzene	TOT	ng/L	4	100%	0.1658	0.00590	4	100%	0.0698	0.00257	56%
Hexa-Dioxins	TOT	pg/L	4	100%	20.10	0.00077	4	75%	2.71	0.00011	85%
Hexa-Furans	TOT	pg/L	4	100%	1.35	0.000057	4	50%	0.2363	0.0000062	89%
HFPO-DA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
High Molecular Weight PAH`s	TOT	µg/L	12	92%	0.4011	13.13	12	83%	0.0791	2.31	82%
Hydrochlorothiazide	TOT	ng/L	4	100%	1224.75	43.07	4	100%	949.25	34.13	21%
Ibuprofen	TOT	ng/L	4	100%	13937.50	500.19	4	100%	1286.75	46.32	91%
Indeno(1,2,3-C,D)Pyrene	TOT	µg/L	12	33%	---	---	12	8%	---	---	---
Lincomycin	TOT	ng/L	4	100%	7.0275	0.27	4	100%	5.8975	0.22	16%
Lomefloxacin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Low Molecular Weight PAH`s	TOT	µg/L	12	100%	0.6619	22.74	12	100%	0.1586	5.44	76%
Methoxyclor	TOT	ng/L	4	75%	0.16	0.00483	4	100%	0.052	0.0019	61%
Miconazole	TOT	ng/L	4	100%	4.2425	0.15	4	100%	2.8795	0.10	35%
Mirex	TOT	ng/L	4	50%	0.0127	0.000280	4	0%	---	---	100%
Monochloro Biphenyls	TOT	pg/L	4	100%	46.95	0.00169	4	100%	69.82	0.0025	-50%
Naphthalene	TOT	µg/L	12	100%	0.0987	3.33	12	92%	0.0262	0.86	74%
Naproxen	TOT	ng/L	4	100%	6435.00	226.38	4	100%	1727.50	63.44	72%
N-EtFOSA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
N-EtFOSE	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
NFDHA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
N-MeFOSA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
N-MeFOSE	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
Nonachloro Biphenyls	TOT	pg/L	4	100%	21.27	0.00080	4	100%	7.2600	0.00026	68%
Norfloxacin	TOT	ng/L	4	50%	10.89	0.2837	4	25%	---	---	100%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Norgestimate	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Np	TOT	ng/L	4	100%	621.75	21.90	4	100%	111.78	3.88	82%
OCDD	TOT	pg/L	4	100%	278.50	0.0104	4	100%	56.36	0.002198	79%
OCDF	TOT	pg/L	4	100%	4.50	0.00018	4	100%	1.02	0.000042	77%
Octachloro Biphenyls	TOT	pg/L	4	100%	89.18	0.0033	4	100%	18.85	0.000732	78%
Ofloxacin	TOT	ng/L	4	100%	70.4	2.78	4	100%	37.3	1.30	53%
Ormetoprim	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Oxacillin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Oxolinic Acid	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Oxychlordane	TOT	ng/L	4	100%	0.0343	0.00133	4	25%	---	---	100%
Pbde 10	TOT	pg/L	2	0%	---	---	2	0%	---	---	---
Pbde 100	TOT	pg/L	4	100%	2527.75	0.08727	4	100%	670.5000	0.02371	73%
Pbde 105	TOT	pg/L	4	75%	3.48	0.00007	4	0%	---	---	100%
Pbde 116	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
Pbde 119/120	TOT	pg/L	4	100%	22.9	0.00080	4	100%	6.33	0.000231	71%
Pbde 12/13	TOT	pg/L	4	100%	6.72	0.00024	4	75%	2.13	0.0000388	84%
Pbde 126	TOT	pg/L	4	75%	3.96	0.00010	4	0%	---	---	100%
Pbde 128	TOT	pg/L	4	75%	6.74	0.00019	4	0%	---	---	100%
Pbde 138/166	TOT	pg/L	4	100%	169.9	0.0059	4	100%	33.73	0.00121	80%
Pbde 140	TOT	pg/L	4	100%	51.42	0.0018	4	100%	10.87	0.000391	78%
Pbde 15	TOT	pg/L	4	100%	22.20	0.00082	4	100%	5.04	0.000196	76%
Pbde 153	TOT	pg/L	4	100%	1282	0.0444	4	100%	297.75	0.0106	76%
Pbde 154	TOT	pg/L	4	100%	1096	0.0382	4	100%	251.5	0.00896	77%
Pbde 155	TOT	pg/L	4	100%	85.85	0.00299	4	100%	18.15	0.000640	79%
Pbde 17/25	TOT	pg/L	4	100%	101.6	0.00372	4	100%	33.53	0.00128	66%
Pbde 181	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
Pbde 183	TOT	pg/L	4	100%	470.43	0.015	4	100%	46.40	0.00167	89%
Pbde 190	TOT	pg/L	4	25%	---	---	4	25%	---	---	---
Pbde 203	TOT	pg/L	4	100%	223	0.008	4	100%	29.30	0.00112	85%
Pbde 206	TOT	pg/L	4	100%	968	0.03	4	100%	169.75	0.00618	82%
Pbde 207	TOT	pg/L	4	100%	965	0.0333	4	100%	173.28	0.00616	81%
Pbde 208	TOT	pg/L	4	100%	524	0.0186	4	100%	102.1	0.00365	80%
Pbde 209	TOT	pg/L	4	100%	24008	0.828	4	100%	2403	0.0886	89%
Pbde 28/33	TOT	pg/L	4	100%	187	0.00643	4	100%	53.975	0.00191	70%
Pbde 30	TOT	pg/L	3	33%	---	---	3	0%	---	---	---

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Pbde 32	TOT	pg/L	4	75%	2.56	0.000097	4	0%	---	---	100%
Pbde 35	TOT	pg/L	4	75%	2.56	0.0000531	4	0%	---	---	100%
Pbde 37	TOT	pg/L	4	75%	5.64	0.000156	4	75%	2.48	0.00005	68%
Pbde 47	TOT	pg/L	4	100%	11915	0.4095	4	100%	3402.50	0.1190	71%
Pbde 49	TOT	pg/L	4	100%	489	0.01755	4	100%	113.1750	0.004184	76%
Pbde 51	TOT	pg/L	4	100%	45.95	0.0016	4	100%	12.59	0.00046	72%
Pbde 66	TOT	pg/L	4	100%	222	0.00771	4	100%	59.53	0.00213	72%
Pbde 7	TOT	pg/L	2	100%	9.30	0.000405	2	50%	3.5900	0.000064	84%
Pbde 71	TOT	pg/L	4	100%	39.45	0.00135	4	100%	12.9450	0.000451	67%
Pbde 75	TOT	pg/L	4	100%	17.25	0.00061	4	100%	5.36	0.000195	68%
Pbde 77	TOT	pg/L	4	50%	2.478	0.0000405	4	0%	---	---	100%
Pbde 79	TOT	pg/L	4	50%	7.01	0.00017	4	50%	3.15	0.000056	68%
Pbde 8/11	TOT	pg/L	4	75%	5.54	0.00015	4	75%	2.58	0.000054	65%
Pbde 85	TOT	pg/L	4	100%	487	0.01688	4	100%	124.35	0.004431	74%
Pbde 99	TOT	pg/L	4	100%	11920	0.411202	4	100%	3178	0.112	73%
PCB	TOT	pg/L	4	100%	31.45	0.0013	4	100%	27.56	0.0011	19%
PCB10	TOT	pg/L	4	100%	2.54	0.00010	4	100%	0.84	0.000034	67%
PCB103	TOT	pg/L	4	100%	1.89	0.000068	4	75%	0.53	0.000013	80%
PCB104	TOT	pg/L	4	100%	0.89	0.000033	4	75%	0.40	0.0000093	72%
PCB105	TOT	pg/L	4	100%	45.75	0.0017	4	100%	12.30	0.00048	72%
PCB106	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
PCB107	TOT	pg/L	4	100%	7.07	0.00027	4	100%	2.00	0.000077	71%
PCB-108 + 124	TOT	pg/L	4	100%	5.36	0.00020	4	100%	1.59	0.000062	69%
PCB11	TOT	pg/L	4	100%	284.25	0.010	4	100%	129.23	0.0051	49%
PCB110/115	TOT	pg/L	4	100%	184.75	0.0068	4	100%	51.45	0.0019	72%
PCB111	TOT	pg/L	4	25%	---	---	4	50%	0.4453	0.0000085	---
PCB112	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB114	TOT	pg/L	4	100%	3.72	0.00014	4	100%	1.06	0.000039	71%
PCB118	TOT	pg/L	4	100%	118.80	0.0044	4	100%	31.50	0.0012	72%
PCB12/13	TOT	pg/L	4	100%	10.67	0.00039	4	100%	4.53	0.00018	54%
PCB120	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB121	TOT	pg/L	4	100%	1.94	0.000069	4	75%	0.55	0.000014	80%
PCB122	TOT	pg/L	4	75%	1.35	0.000045	4	25%	---	---	100%
PCB123	TOT	pg/L	4	100%	2.19	0.000084	4	100%	0.68	0.000027	68%
PCB126	TOT	pg/L	4	50%	0.63	0.000014	4	25%	---	---	100%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
PCB127	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB128/166	TOT	pg/L	4	100%	24.40	0.0010	4	100%	7.16	0.00029	70%
PCB129/138/160/163	TOT	pg/L	4	100%	161.75	0.0061	4	100%	44.15	0.00173	72%
PCB130	TOT	pg/L	4	100%	9.04	0.00034	4	100%	2.62	0.00010	71%
PCB131	TOT	pg/L	4	100%	2.77	0.00010	4	100%	0.83	0.000031	70%
PCB132	TOT	pg/L	4	100%	52.08	0.0019	4	100%	14.25	0.00053	72%
PCB133	TOT	pg/L	4	100%	3.11	0.00011	4	100%	0.98	0.000035	69%
PCB134/143	TOT	pg/L	4	100%	9.42	0.00035	4	100%	2.54	0.000092	74%
PCB135/151/154	TOT	pg/L	4	100%	59.35	0.0022	4	100%	16.93	0.00062	71%
PCB136	TOT	pg/L	4	100%	25.45	0.00093	4	100%	7.33	0.00027	71%
PCB137	TOT	pg/L	4	100%	8.18	0.00031	4	100%	2.22	0.000086	72%
PCB139/140	TOT	pg/L	4	100%	4.54	0.00017	4	100%	1.25	0.000046	72%
PCB14	TOT	pg/L	4	100%	2.63	0.000093	4	100%	0.78	0.000030	68%
PCB141	TOT	pg/L	4	100%	27.08	0.0010	4	100%	7.51	0.00029	71%
PCB142	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB144	TOT	pg/L	4	100%	9.73	0.00035	4	100%	2.76	0.00010	71%
PCB145	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB146	TOT	pg/L	4	100%	21.60	0.00079	4	100%	6.26	0.00024	70%
PCB147/149	TOT	pg/L	4	100%	119.28	0.0044	4	100%	32.50	0.0012	72%
PCB148	TOT	pg/L	4	100%	1.47	0.000052	4	50%	0.4275	0.0000080	85%
PCB15	TOT	pg/L	4	100%	33.35	0.0012	4	100%	9.63	0.00036	70%
PCB150	TOT	pg/L	4	75%	1.08	0.000032	4	50%	0.38	0.0000064	80%
PCB152	TOT	pg/L	4	75%	1.55	0.000047	4	75%	1.63	0.000047	0%
PCB153/168	TOT	pg/L	4	100%	156.50	0.0058	4	100%	42.30	0.0017	72%
PCB155	TOT	pg/L	4	100%	18.02	0.00064	4	100%	4.89	0.00018	72%
PCB156157	TOT	pg/L	4	100%	18.95	0.00072	4	100%	5.15	0.00021	71%
PCB158	TOT	pg/L	4	100%	13.69	0.00051	4	100%	3.58	0.00014	73%
PCB159	TOT	pg/L	4	50%	0.81	0.000020	4	50%	0.94	0.000023	-15%
PCB16	TOT	pg/L	4	100%	44.35	0.0016	4	100%	13.88	0.00052	67%
PCB161	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB162	TOT	pg/L	4	100%	0.68	0.000026	4	25%	---	---	100%
PCB164	TOT	pg/L	4	100%	8.30	0.00031	4	100%	2.4225	0.000093	70%
PCB165	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB167	TOT	pg/L	4	100%	5.62	0.00022	4	100%	1.6775	0.000069	68%
PCB169	TOT	pg/L	4	25%	---	---	4	25%	---	---	---

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
PCB17	TOT	pg/L	4	100%	45.90	0.0017	4	100%	12.8000	0.00049	71%
PCB170	TOT	pg/L	4	100%	28.93	0.0011	4	100%	7.0325	0.00028	74%
PCB171/173	TOT	pg/L	4	100%	8.27	0.00031	4	100%	2.1425	0.00008	74%
PCB172	TOT	pg/L	4	100%	5.97	0.00022	4	100%	1.4750	0.00006	74%
PCB174	TOT	pg/L	4	100%	52.80	0.0018	4	100%	35.4275	0.00112	39%
PCB175	TOT	pg/L	4	100%	1.77	0.000065	4	75%	0.4378	0.000011	84%
PCB176	TOT	pg/L	4	100%	5.52	0.00020	4	100%	1.4575	0.000054	73%
PCB177	TOT	pg/L	4	100%	18.08	0.00067	4	100%	4.6075	0.00018	74%
PCB178	TOT	pg/L	4	100%	10.06	0.00036	4	100%	2.5325	0.000094	74%
PCB179	TOT	pg/L	4	100%	18.93	0.00068	4	100%	5.0125	0.00019	73%
PCB18/30	TOT	pg/L	4	100%	136.90	0.0048	4	100%	39.0250	0.0014	70%
PCB180/193	TOT	pg/L	4	100%	90.95	0.0034	4	100%	21.3750	0.00084	75%
PCB181	TOT	pg/L	4	50%	0.63	0.000015	4	25%	---	---	100%
PCB182	TOT	pg/L	4	50%	0.42	0.0000076	4	0%	---	---	100%
PCB183/185	TOT	pg/L	4	100%	24.83	0.00090	4	100%	6.3425	0.00024	73%
PCB184	TOT	pg/L	4	100%	32.83	0.0011	4	100%	7.5950	0.00028	76%
PCB186	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB187	TOT	pg/L	4	100%	52.4250	0.0019	4	100%	13.8000	0.00053	73%
PCB188	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB189	TOT	pg/L	4	100%	1.89	0.000071	4	50%	0.4173	0.000012	83%
PCB19	TOT	pg/L	4	100%	18.00	0.00071	4	100%	4.92	0.00020	72%
PCB190	TOT	pg/L	4	100%	6.54	0.00024	4	100%	1.83	0.000069	71%
PCB191	TOT	pg/L	4	100%	1.18	0.000043	4	25%	---	---	100%
PCB192	TOT	pg/L	4	0%	---	---	4	0%	---	---	---
PCB194	TOT	pg/L	4	100%	18.43	0.00068	4	100%	5.05	0.00019	71%
PCB195	TOT	pg/L	4	100%	6.05	0.00022	4	100%	1.47	0.000056	75%
PCB196	TOT	pg/L	4	100%	9.09	0.00033	4	100%	2.18	0.000082	75%
PCB197/200	TOT	pg/L	4	100%	5.73	0.00021	4	100%	1.37	0.000050	75%
PCB198/199	TOT	pg/L	4	100%	23.93	0.00087	4	100%	5.88	0.00022	75%
PCB2	TOT	pg/L	4	100%	13.16	0.00050	4	100%	9.51	0.00038	23%
PCB20/28	TOT	pg/L	4	100%	117.78	0.00423	4	100%	31.83	0.0012	71%
PCB201	TOT	pg/L	4	100%	3.27	0.00012	4	100%	0.73	0.000028	76%
PCB202	TOT	pg/L	4	100%	6.98	0.00025	4	100%	1.77	0.000066	74%
PCB203	TOT	pg/L	4	100%	15.54	0.00057	4	100%	3.83	0.00014	75%
PCB204	TOT	pg/L	4	100%	1.49	0.000052	4	50%	0.44	0.0000086	83%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
PCB205	TOT	pg/L	4	100%	0.95	0.000036	4	0%	---	---	100%
PCB206	TOT	pg/L	4	100%	25.50	0.00087	4	100%	5.49	0.00020	77%
PCB207	TOT	pg/L	4	100%	3.11	0.00011	4	75%	0.57	0.000015	86%
PCB208	TOT	pg/L	4	100%	8.76	0.00030	4	100%	1.77	0.000063	79%
PCB209	TOT	pg/L	4	100%	21.92	0.00073	4	100%	5.18	0.00018	76%
PCB21/33	TOT	pg/L	4	100%	100.25	0.0035	4	100%	25.68	0.00095	73%
PCB22	TOT	pg/L	4	100%	54.18	0.0019	4	100%	14.93	0.00057	71%
PCB23	TOT	pg/L	4	75%	0.40	0.000014	4	0%	---	---	100%
PCB24	TOT	pg/L	4	100%	1.43	0.000052	4	100%	0.43	0.000017	67%
PCB25	TOT	pg/L	4	100%	18.18	0.00067	4	100%	4.76	0.00018	73%
PCB26/29	TOT	pg/L	4	100%	26.60	0.00098	4	100%	7.26	0.00028	71%
PCB27	TOT	pg/L	4	100%	13.19	0.00051	4	100%	3.30	0.00013	74%
PCB3	TOT	pg/L	4	100%	26.03	0.00100	4	100%	39.85	0.0014	-39%
PCB31	TOT	pg/L	4	100%	126.20	0.0045	4	100%	34.98	0.0013	71%
PCB32	TOT	pg/L	4	100%	31.58	0.0012	4	100%	8.83	0.00034	71%
PCB34	TOT	pg/L	4	100%	0.83	0.000032	4	25%	---	---	100%
PCB35	TOT	pg/L	4	100%	12.32	0.00043	4	100%	3.49	0.00013	70%
PCB36	TOT	pg/L	4	100%	3.59	0.00013	4	100%	0.80	0.00003	77%
PCB37	TOT	pg/L	4	100%	33.98	0.0012	4	100%	8.81	0.00033	73%
PCB38	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
PCB39	TOT	pg/L	4	75%	1.44	0.000045	4	25%	---	---	100%
PCB4	TOT	pg/L	4	100%	77.98	0.0032	4	100%	24.20	0.00103	68%
PCB40/41/71	TOT	pg/L	4	100%	58.03	0.0021	4	100%	15.83	0.00059	72%
PCB42	TOT	pg/L	4	100%	32.85	0.0012	4	100%	8.58	0.00032	73%
PCB43	TOT	pg/L	4	100%	4.49	0.0002	4	100%	1.24	0.000046	72%
PCB44/47/65	TOT	pg/L	4	100%	642.75	0.0221	4	100%	175.25	0.0068	69%
PCB45/51	TOT	pg/L	4	100%	129.93	0.0045	4	100%	38.75	0.0015	67%
PCB46	TOT	pg/L	4	100%	8.33	0.00030	4	100%	2.17	0.000082	73%
PCB48	TOT	pg/L	4	100%	24.55	0.00088	4	100%	6.57	0.00024	72%
PCB49/69	TOT	pg/L	4	100%	99.93	0.0036	4	100%	25.45	0.0010	73%
PCB5	TOT	pg/L	4	100%	2.38	0.000085	4	100%	0.99	0.000037	57%
PCB50/53	TOT	pg/L	4	100%	22.70	0.00085	4	100%	5.51	0.00021	75%
PCB52	TOT	pg/L	4	100%	232.25	0.0084	4	100%	61.38	0.0023	73%
PCB54	TOT	pg/L	4	100%	0.91	0.000038	4	25%	---	---	100%
PCB55	TOT	pg/L	4	75%	2.64	0.000084	4	100%	0.81	0.000030	64%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
PCB56	TOT	pg/L	4	100%	38.83	0.0014	4	100%	10.57	0.00039	72%
PCB57	TOT	pg/L	4	100%	0.81	0.000031	4	0%	---	---	100%
PCB58	TOT	pg/L	4	25%	---	---	4	25%	---	---	---
PCB59/62/75	TOT	pg/L	4	100%	11.71	0.00043	4	100%	3.45	0.00013	69%
PCB6	TOT	pg/L	4	100%	19.78	0.00073	4	100%	5.76	0.00023	69%
PCB60	TOT	pg/L	4	100%	25.75	0.00091	4	100%	6.95	0.00026	72%
PCB61/70/74/76	TOT	pg/L	4	100%	180.65	0.0065	4	100%	48.98	0.0018	72%
PCB63	TOT	pg/L	4	100%	4.50	0.00016	4	100%	1.22	0.000046	72%
PCB64	TOT	pg/L	4	100%	53.18	0.0019	4	100%	14.70	0.00054	71%
PCB66	TOT	pg/L	4	100%	100.20	0.0036	4	100%	30.85	0.0011	68%
PCB67	TOT	pg/L	4	100%	3.84	0.00014	4	100%	1.17	0.000044	69%
PCB68	TOT	pg/L	4	100%	67.68	0.0023	4	100%	19.78	0.00075	67%
PCB7	TOT	pg/L	4	100%	11.40	0.00051	4	100%	7.28	0.00033	34%
PCB72	TOT	pg/L	4	100%	0.86	0.000033	4	0%	---	---	100%
PCB73	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
PCB77	TOT	pg/L	4	100%	8.27	0.00030	4	100%	2.47	0.000093	69%
PCB78	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
PCB79	TOT	pg/L	4	50%	2.27	0.000066	4	25%	---	---	100%
PCB8	TOT	pg/L	4	100%	61.25	0.0022	4	100%	16.03	0.00063	72%
PCB80	TOT	pg/L	4	25%	---	---	4	0%	---	---	---
PCB81	TOT	pg/L	4	100%	0.58	0.000022	4	25%	---	---	100%
PCB82	TOT	pg/L	4	100%	18.86	0.00069	4	100%	5.34	0.00020	71%
PCB83/99	TOT	pg/L	4	100%	86.60	0.0032	4	100%	24.43	0.00093	71%
PCB84	TOT	pg/L	4	100%	40.98	0.0015	4	100%	11.79	0.00043	71%
PCB85/116/117	TOT	pg/L	4	100%	29.00	0.0011	4	100%	8.43	0.00032	70%
PCB86/87/97/108/119/125	TOT	pg/L	4	100%	178.25	0.0067	4	100%	91.45	0.0035	48%
PCB88/91	TOT	pg/L	4	100%	23.85	0.00087	4	100%	6.82	0.00025	71%
PCB89	TOT	pg/L	4	100%	2.18	0.000079	4	75%	0.62	0.000017	79%
PCB9	TOT	pg/L	4	100%	6.12	0.00022	4	100%	2.37	0.000086	60%
PCB90/101/113	TOT	pg/L	4	100%	185.00	0.0068	4	100%	52.28	0.0020	71%
PCB92	TOT	pg/L	4	100%	35.88	0.0013	4	100%	10.32	0.00038	71%
PCB93/95/98/100/102	TOT	pg/L	4	100%	155.53	0.0056	4	100%	45.93	0.0017	70%
PCB94	TOT	pg/L	4	100%	1.09	0.000040	4	75%	0.35	0.0000076	81%
PCB96	TOT	pg/L	4	100%	1.61	0.000058	4	75%	0.47	0.000011	80%
PCBs Total	TOT	pg/L	4	100%	5210.00	0.19	4	100%	1512.50	0.058	69%

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
PCBTeq 3	TOT	pg/L	4	100%	0.27	0.000011	4	100%	0.054	0.0000023	78%
PCBTeq 4	TOT	pg/L	4	100%	0.46	0.000018	4	100%	0.24	0.0000092	49%
Penicillin G	TOT	ng/L	3	67%	12.41	0.37	3	67%	3.89	0.096	74%
Penicillin V	TOT	ng/L	2	0%	---	---	2	0%	---	---	---
Pentachloro Biphenyls	TOT	pg/L	4	100%	999.25	0.037	4	100%	263.25	0.0099	73%
Penta-Dioxins	TOT	pg/L	4	75%	2.70	0.00010	4	50%	0.31	0.0000093	91%
Penta-Furans	TOT	pg/L	4	100%	1.01	0.000037	4	50%	0.24	0.0000062	83%
Perylene	TOT	ng/L	4	100%	7.02	0.24	4	50%	0.47	0.0080	97%
PFBS	TOT	ng/L	4	100%	19.05	0.76	4	100%	17.94	0.72	6%
PFDA	TOT	ng/L	4	75%	1.53	0.062	4	100%	1.17	0.048	22%
PFDoA	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
PFDoS	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFDS	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFEESA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFHpA	TOT	ng/L	4	100%	6.84	0.28	4	100%	5.88	0.2420	13%
PFHpS	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFHxA	TOT	ng/L	4	100%	41.31	1.68	4	100%	38.50	1.5419	8%
PFHxS	TOT	ng/L	4	100%	10.65	0.42	4	100%	9.60	0.3788	10%
PFMBA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFMPA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFNA	TOT	ng/L	4	100%	1.28	0.053	4	100%	1.02	0.0415	21%
PFNS	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
PFOA	TOT	ng/L	4	100%	16.78	0.68	4	100%	15.04	0.61	11%
PFOS	TOT	ng/L	4	100%	8.19	0.35	4	100%	4.91	0.21	38%
PFOSA	TOT	ng/L	4	25%	---	---	4	0%	---	---	---
PFPeA	TOT	ng/L	4	100%	22.02	0.95	4	100%	22.56	0.95	0%
PFPeS	TOT	ng/L	4	50%	0.63	0.018	4	25%	---	---	100%
PFTeDA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFTrDA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
PFUnA	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Phenanthrene	TOT	µg/L	12	92%	0.1843	5.85	12	92%	0.0341	1.03	82%
Pyrene	TOT	µg/L	12	92%	0.0907	2.77	12	92%	0.0233	0.58	79%
Quinoline	TOT	µg/L	2	0%	---	---	2	0%	---	---	---
Roxithromycin	TOT	ng/L	4	100%	1.8790	0.067	4	100%	2.44	0.085	-27%
Sarafloxacin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---

Appendix B5, cont'd

Parameter	State	Unit	N	Influent			N	Effluent			% Removal
				% Freq	Mean	Load (kg/year)		% Freq	Mean	Load (kg/year)	
Sulfachloropyridazine	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Sulfadiazine	TOT	ng/L	4	0%	---	---	4	50%	---	0.021	---
Sulfadimethoxine	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Sulfamerazine	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Sulfamethazine	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Sulfamethizole	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Sulfamethoxazole	TOT	ng/L	4	100%	1007.00	33.41	4	100%	449.75	15.62	53%
Sulfanilamide	TOT	ng/L	4	75%	48.55	1.37	4	100%	54.33	1.90	-38%
Sulfathiazole	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Tetrachloro Biphenyls	TOT	pg/L	4	100%	1682.75	0.059	4	100%	456.75	0.017	71%
Tetra-Dioxins	TOT	pg/L	4	75%	0.31	0.000011	4	0%	---	---	100%
Tetra-Furans	TOT	pg/L	4	100%	0.80	0.000029	4	0%	---	---	100%
Thiabendazole	TOT	ng/L	4	100%	30.85	1.05	4	100%	27.28	0.96	8%
Total PAH	TOT	µg/L	12	100%	1.06	36.15	12	92%	0.23	7.54	79%
Trichloro Biphenyls	TOT	pg/L	4	100%	778.25	0.028	4	100%	209.50	0.0079	72%
Triclocarban	TOT	ng/L	4	75%	1.68	0.050	4	100%	1.38	0.047	5%
Triclosan	TOT	ng/L	4	0%	---	---	4	100%	13.85	0.51	---
Trimethoprim	TOT	ng/L	4	100%	299.25	10.65	4	100%	213.00	7.57	29%
Tylosin	TOT	ng/L	4	25%	---	---	4	50%	1.3235	0.030	---
Virginiamycin	TOT	ng/L	4	0%	---	---	4	0%	---	---	---
Warfarin	TOT	ng/L	4	75%	2.32	0.063	4	100%	2.1175	0.076	-21%

Appendix B6 Acute Toxicity Test Results and Bench Sheets

Acute Toxicity Test Results and Bench Sheets available upon request
Contact: CRD's Environmental Monitoring Program, 250.360.3082

Appendix B7 Chronic Toxicity Test Results and Bench Sheets

Chronic Toxicity Test Results and Bench Sheets available upon request
Contact: CRD's Environmental Monitoring Program, 250.360.3082

APPENDIX C
2025 SURFACE WATER MONITORING

Appendix C1	Parameter List
Appendix C2	Surface Water Stations
Appendix C3	McLoughlin Point Surface Results - 5 Sampling Events in 30 Days - Fecal Coliforms
Appendix C4	McLoughlin Point Surface Results - 5 Sampling Events in 30 Days - Enterococci
Appendix C5	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days - Fecal Coliforms
Appendix C6	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days - Enterococci
Appendix C7	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – NH3
Appendix C8	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Silver
Appendix C9	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Arsenic
Appendix C10	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Boron
Appendix C11	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Cadmium
Appendix C12	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Copper
Appendix C13	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Lead
Appendix C14	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Manganese
Appendix C15	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Nickel
Appendix C16	McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Zinc
Appendix C17	CTD Plots

Appendix C1 Parameter List

Parameter	Edge of IDZ (3 depths top, middle, bottom)*	Surface Water (1 m depth)
CONVENTIONAL VARIABLES		
conductivity	x	
enterococci	x	x
fecal coliform	x	x
hardness (as $CaCO_3$)	x	
ammonia (NH_3)	x	
total Kjeldahl nitrogen	x*	
nitrate	x	
nitrite	x	
nitrogen, total	x	
oil & grease, mineral	x*	
oil & grease, total	x*	
organic carbon, total	x*	
pH	x	
phosphate, dissolved	x*	
phosphate, total	x*	
salinity	x	
sulphate	x	
sulphide	x	
suspended solids, total	x	
temperature	x	
CTD parameters	x	
METALS TOTAL		
aluminum	x	
antimony	x	
arsenic	x	
barium	x	
beryllium	x	
bismuth	x	
cadmium	x	
calcium	x	
chromium	x	
chromium VI	x	
cobalt	x	
copper	x	
iron	x	
lead	x	
lithium	x	
magnesium	x	
manganese	x	
mercury	x	
molybdenum	x	
nickel	x	
phosphorus	x	
potassium	x	
selenium	x	
silver	x	
sodium	x	

Appendix C1, cont'd

Parameter	Edge of IDZ (3 depths top, middle, bottom)*	Surface Water (1 m depth)
strontium	x	
thallium	x	
tin	x	
titanium	x	
vanadium	x	
zinc	x	

Notes: IDZ – initial dilution zone, *Top=5 m depth, middle=in predicted plume, bottom=5 m off bottom, x* sampled once in each 5 in 30 sample quarter.

Appendix C2 Surface Water Stations

McLoughlin Point	Latitude 48º	Longitude 123º
McL-01	24.299	24.409
McL-14	24.515	24.411
McL-16	24.300	24.085
McL-18	24.083	24.407
McL-20	24.298	24.733
McL-22	24.731	24.412
McL-24	24.606	23.953
McL-26	24.302	23.760
McL-28	23.996	23.948
McL-30	23.867	24.405
McL-32	23.992	24.865
McL-34	24.297	25.057
McL-36	24.603	24.870
Sample D1	Variable location depending on wind and current	
+ four dynamic edge of IDZ stations at 3 depths (5 m, middle of predicted plume and 5 m above bottom depth)		
Macaulay Point	**Latitude 48˚**	**Longitude 123˚**
Mac-01	24.186	24.616
Mac-14	24.402	24.616
Mac-16	24.186	24.290
Mac-18	23.970	24.616
Mac-20	24.186	24.941
Mac-22	24.617	24.616
Mac-24	24.491	24.155
Mac-26	24.186	23.965
Mac-28	23.880	24.155
Mac-30	23.754	24.616
Mac-32	23.880	25.076
Mac-34	24.186	25.266
Mac-36	24.491	25.076
+ four dynamic edge of IDZ stations at 3 depths (5 m, middle of predicted plume and 5 m above bottom depth)		
Clover Point	**Latitude 48˚**	**Longitude 123˚**
Clo-01	23.701	20.764
Clo-14	23.916	20.764
Clo-16	23.701	20.438
Clo-18	23.485	20.764
Clo-20	23.701	21.089
Clo-22	24.132	20.764
Clo-24	24.006	20.304
Clo-26	23.701	20.113
Clo-28	23.395	20.304
Clo-30	23.269	20.764
Clo-32	23.395	21.224
Clo-34	23.701	21.414
Clo-36	24.006	21.224
+ four dynamic edge of IDZ stations at 3 depths (5 m, middle of predicted plume and 5 m above bottom depth)		

Appendix C2, cont'd

Reference	Latitude 48º	Longitude 123º
Constance Bank	20.640	19.080
Parry Bay	21.258	30.647

Appendix C3 McLoughlin Point Surface Results 5 Sampling Events in 30 Days - Fecal Coliforms

Fecal Coliforms	Winter						Spring						Summer						Autumn					
	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
McL-01	4	2	12	5	NS	5	<1	18	3,300	<1	<1	9	85	<1	<1	<1	<1	2	<1	3	6	1	2	2
McL-14	5	2	5	6	NS	4	<1	21	7	10	<1	4	1	<1	<1	<1	<1	1	<1	2	<1	3	1	1
McL-16	11	1	6	7	NS	5	<1	14	29	<1	<1	3	1	<1	<1	<1	<1	1	<1	4	5	3	1	2
McL-18	17	<1	2	2	NS	3	2	1	11	<1	<1	2	4	<1	<1	<1	<1	1	<1	2	<1	4	<1	2
McL-20	7	2	9	4	NS	5	<1	30	460	<1	<1	7	58	<1	1	<1	<1	2	<1	2	<1	<1	1	1
McL-22	11	1	2	18	NS	4	1	19	9	<1	<1	3	1	<1	<1	<1	<1	1	<1	4	<1	3	1	2
McL-24	7	3	6	8	NS	6	3	15	<1	<1	<1	2	<1	<1	<1	<1	<1	1	<1	6	9	5	1	3
McL-26	13	3	2	6	NS	5	1	18	<1	<1	<1	2	2	<1	<1	<1	<1	1	<1	4	15	6	<1	3
McL-28	12	1	<1	1	NS	2	4	<1	1	<1	1	1	<1	<1	<1	<1	<1	1	<1	4	1	4	<1	2
McL-30	8	2	3	1	NS	3	3	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	2	<1	6	<1	2
McL-32	7	2	3	<1	NS	3	<1	26	18	<1	1	3	3	<1	<1	<1	<1	1	<1	2	<1	8	1	2
McL-34	16	1	6	5	NS	5	<1	14	9	<1	<1	3	<1	<1	<1	<1	<1	1	<1	4	<1	1	1	1
McL-36	7	1	12	4	NS	4	71	33	1	<1	<1	5	2	1	<1	<1	<1	1	<1	4	<1	5	2	2
McL-D1	7	3	2	<1	NS	3	1	25	17	4	<1	4	NS	<1	<1	<1	<1	1	<1	2	10	25	<1	3
Ref-PB	<1	<1	<1	1	NS	1	2	2	<1	<1	1	1	NS	<1	<1	<1	<1	1	<1	2	<1	1	1	1
Ref-CB	1	<1	2	5	NS	2	1	6	9	2	1	3	<1	<1	<1	2	<1	1	<1	<1	1	1	1	1

Notes: Red shaded cells indicate exceedance to historical BC WQG Geomean of 200 CFU/100 mL, Geomean = Geometric Mean

Appendix C4 McLoughlin Point Surface Results 5 Sampling Events in 30 Days - Enterococci

Enterococci	Winter						Spring						Summer						Autumn					
	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
McL-01	3	2	2	3	NS	2	<1	7	1000	<1	<1	6	42	<1	<1	<1	<1	2	<1	<1	<1	1	2.5	1
McL-14	5	1	3	2	NS	2	<1	19	3	4	<1	3	<1	<1	<1	<1	<1	1	<1	<1	1	5	1	1
McL-16	7	<1	2	3	NS	3	<1	14	5	<1	<1	2	<1	<1	<1	<1	<1	1	<1	1	4	3	<1	2
McL-18	10	2	<1	2	NS	3	1	3	1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	<1	<1	3	1	1
McL-20	3	1	1	1	NS	1	<1	22	71	<1	<1	4	21	<1	3	<1	3	3	<1	<1	<1	<1	1	1
McL-22	11	1	2	1	NS	2	<1	10	3	<1	<1	2	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	2	1
McL-24	3	1	1	4	NS	2	1	14	2	<1	<1	2	<1	<1	<1	<1	<1	1	<1	<1	<1	2	<1	1
McL-26	14	4	<1	<1	NS	3	<1	4	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	1	5	<1	2	2
McL-28	11	<1	<1	<1	NS	2	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
McL-30	5	<1	1	<1	NS	1	3	<1	<1	<1	<1	1	<1	<1	10	<1	<1	2	<1	5	<1	2	<1	2
McL-32	5	1	1	3	NS	2	<1	24	1	<1	<1	2	1	<1	7	<1	<1	1	<1	<1	<1	2	<1	1
McL-34	14	2	3	3	NS	4	<1	15	<1	<1	<1	2	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
McL-36	2	1	4	2	NS	2	67	28	1	<1	<1	5	<1	1	<1	<1	<1	1	<1	3	<1	<1	4	2
McL-D1	3	2	2	26	NS	4	<1	18	4	<1	<1	2	NS	<1	<1	<1	<1	1	<1	5	1	1	<1	1
Ref-PB	<1	<1	<1	1	NS	1	3	1	<1	<1	<1	1	NS	<1	<1	<1	<1	1	<1	3	<1	<1	<1	1
Ref-CB	<1	<1	<1	2	NS	1	<1	8	2	<1	<1	2	4	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1

Notes: Red shaded cells indicate exceedance to Health Canada's Geomean of 35 CFU/100 mL Blue shaded cells indicate exceedance to Health Canada (2012) WQG of 70 CFU/100 mL, Geomean = Geometric Mean.

Appendix C5 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days - Fecal Coliforms (CFU/100mL)

Fecal	Historical BC WQG Geomean 200 CFU/100mL						
Winter							**Geomean**
Station 1	Top	19	2.0	8	1	NS	4
	Middle	34	1.0	160	9	NS	15
	Bottom	24	<1.0	170	12	NS	15
Station 2	Top	29	<1.0	4	6	NS	5
	Middle	16	1.0	11	8	NS	6
	Bottom	28	<1.0	4	21	NS	7
Station 3	Top	17	4.0	7	1	NS	5
	Middle	22	3.0	4	10	NS	7
	Bottom	2	<1.0	2	25	NS	3
Station 4	Top	10	9.0	6	3	NS	6
	Middle	7	3.0	8	69	NS	10
	Bottom	1	<1.0	6	72	NS	5
Ref - PB	Top	<1	2.0	<1	13	NS	2
	Middle	<1	2.0	<1	2	NS	1
	Bottom	<1	1.0	<1	<1	NS	1
Ref - CB	Top	<1	<1.0	<1	<1	NS	1
	Middle	<1	<1.0	<1	3	NS	1
	Bottom	1	<1.0	1	4	NS	1
Spring							**Geomean**
Station 1	Top	5	30	1100	37	<1	23
	Middle	73	39	110	64	65	67
	Bottom	840	110	580	6	66	116
Station 2	Top	3	34	31	97	<1	13
	Middle	1000	42	120	150	14	101
	Bottom	1100	95	860	150	7	157
Station 3	Top	<1	28	550	27	<1	13
	Middle	380	18	910	130	1	60
	Bottom	83	49	940	98	9	80
Station 4	Top	3	26	140	1	<1	6
	Middle	11	74	160	39	13	37
	Bottom	12	65	37	37	30	32
Ref - PB	Top	6	39	27	17	<1	10
	Middle	3	20	38	6	<1	7
	Bottom	5	24	39	6	1	8
Ref - CB	Top	2	4	1	2	2	2
	Middle	1	6	1	<1	61	3
	Bottom	<1	9	2	6	<1	3
Summer							**Geomean**
Station 1	Top	83	<1	<1	4	<1	3
	Middle	73	3	1	1	36	6
	Bottom	24	27	27	7	3	13
Station 2	Top	19	<1	<1	6	<1	3
	Middle	92	3	<1	5	13	7
	Bottom	61	35	36	31	60	43
Station 3	Top	6	<1	<1	6	<1	2
	Middle	54	20	<1	<1	18	7
	Bottom	65	51	<1	39	35	21
Station 4	Top	79	<1	<1	3	<1	3
	Middle	47	<1	<1	1	<1	2
	Bottom	5	45	1	34	16	10

Appendix C5, cont'd

Fecal	Historical BC WQG Geomean 200 CFU/100mL						
Ref - PB	Top	13	<1	<1	2	<1	2
	Middle	2	<1	1	86	<1	3
	Bottom	14	3	1	28	<1	4
Ref - CB	Top	NS	17	1	<1	<1	2
	Middle	NS	5	<1	<1	<1	1
	Bottom	NS	<1	<1	7	1	2
Autumn							**Geomean**
Station 1	Top	<1	2	13	12	2	4
	Middle	1	<1	27	1	2	2
	Bottom	<1	<1	42	<1	1	2
Station 2	Top	1	2	9	6	<1	3
	Middle	6	1	51	<1	2	4
	Bottom	<1	<1	55	<1	1	2
Station 3	Top	2	2	15	7	<1	3
	Middle	21	10	2	<1	67	8
	Bottom	19	<1	3	<1	48	5
Station 4	Top	<1	2	8	6	2	3
	Middle	10	1	20	48	49	14
	Bottom	9	1	52	<1	39	7
Ref - PB	Top	<1	<1	4	<1	1	1
	Middle	<1	<1	12	1	1	2
	Bottom	<1	<1	1	<1	3	1
Ref - CB	Top	<1	<1	<1	<1	1	1
	Middle	<1	<1	<1	<1	<1	1
	Bottom	<1	<1	1	1	1	1

Notes:
Orange shaded cells indicate exceedance to BC WQG Geomean of 200 CFU/100 mL, Geomean = Geometric Mean, NS=not sample

Appendix C6 - McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Enterococci (CFU/100mL)

Enterococci	Health Canada Geometric Mean 35 CFU/100 mL and Maximum 70 CFU/100 mL						
Winter							**Geomean**
Station 1	Top	9	3	1	<1	NS	2
	Middle	16	<1	95	2	NS	7
	Bottom	14	1	110	5	NS	9
Station 2	Top	18	<1	2	1	NS	2
	Middle	9	1	3	1	NS	2
	Bottom	14	<1	5	5	NS	4
Station 3	Top	15	4	5	1	NS	4
	Middle	14	3	4	2	NS	4
	Bottom	1	1	4	7	NS	2
Station 4	Top	5	1	3	1	NS	2
	Middle	4	1	3	42	NS	5
	Bottom	<1	<1	4	45	NS	4
Ref - PB	Top	<1	1	<1	<1	NS	1
	Middle	<1	<1	<1	1	NS	1
	Bottom	<1	<1	<1	<1	NS	1
Ref - CB	Top	<1	1	<1	<1	NS	1
	Middle	<1	<1	<1	2	NS	1
	Bottom	<1	<1	<1	2	NS	1
Spring							**Geomean**
Station 1	Top	3	19	930	19	<1	16
	Middle	73	29	66	66	13	41
	Bottom	980	95	130	<1	14	44
Station 2	Top	1	19	6	78	<1	6
	Middle	2,100	33	73	120	1	57
	Bottom	1,100	71	600	130	1	91
Station 3	Top	<1	15	78	24	<1	8
	Middle	570	44	710	110	<1	72
	Bottom	74	40	660	91	1	45
Station 4	Top	2	18	56	<1	<1	5
	Middle	8	68	60	39	1	17
	Bottom	6	50	7	26	4	12
Ref - PB	Top	6	24	6	14	<1	7
	Middle	2	9	22	7	<1	5
	Bottom	3	14	24	4	<1	5
Ref - CB	Top	5	<1	<1	<1	<1	1
	Middle	<1	2	<1	1	<1	1
	Bottom	2	1	<1	<1	<1	1
Summer							**Geomean**
Station 1	Top	45	<1	<1	<1	<1	2
	Middle	42	1	<1	1	<1	2
	Bottom	13	2	13	1	2	4
Station 2	Top	9	<1	<1	1	<1	2
	Middle	33	1	<1	<1	1	2
	Bottom	21	16	17	9	24	17
Station 3	Top	<1	<1	<1	1	<1	1
	Middle	23	3	<1	<1	4	3
	Bottom	27	18	1	9	15	9

Appendix C6, cont'd

Enterococci	Health Canada Geometric Mean 35 CFU/100 mL and Maximum 70 CFU/100 mL						
Station 4	Top	34	<1	<1	<1	<1	2
	Middle	24	<1	<1	<1	<1	2
	Bottom	1	18	<1	10	7	4
Ref - PB	Top	1	<1	<1	<1	<1	1
	Middle	<1	<1	<1	<1	<1	1
	Bottom	6	<1	<1	<1	1	1
Ref - CB	Top	NS	<1	<1	<1	<1	1
	Middle	NS	<1	<1	<1	<1	1
	Bottom	NS	<1	<1	<1	<1	1
Autumn							**Geomean**
Station 1	Top	1	<1	1	1	<1	1
	Middle	1	<1	17	<1	1	2
	Bottom	<1	<1	30	<1	1	2
Station 2	Top	<1	<1	10	2	<1	2
	Middle	2	1	21	<1	1	2
	Bottom	<1	<1	20	1	1	2
Station 3	Top	<1	<1	5	3	<1	2
	Middle	15	6	<1	1	31	5
	Bottom	13	<1	2	1	32	4
Station 4	Top	<1	<1	3	2	<1	1
	Middle	11	1	10	14	20	8
	Bottom	11	<1	27	<1	22	6
Ref - PB	Top	<1	<1	1	<1	<1	1
	Middle	<1	<1	<1	<1	<1	1
	Bottom	<1	<1	<1	<1	<1	1
Ref - CB	Top	<1	<1	<1	<1	<1	1
	Middle	<1	<1	1	<1	<1	1
	Bottom	<1	<1	<1	<1	<1	1

Notes:
Orange shaded cells indicate exceedance to Health Canada (2012) Geomean of 35 CFU/100 mL, Blue shaded cells indicate exceedances to Health Canada (2012) single sample WQG of 70 CFU/100 mL, Geomean = Geometric Mean, NS=not sampled

Appendix C7 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – NH_3 (mg/L N)

NH_3	BC Approved LTC WQG = 1.1 mg/L (NH_3 as N)* (average over 5 samples)						
Winter							**Average**
Station 1	Top	0.065	0.045	0.035	0.045	NS	0.048
	Middle	0.077	0.035	0.079	0.037	NS	0.057
	Bottom	0.081	0.046	0.11	0.039	NS	0.069
Station 2	Top	0.077	0.044	0.037	0.067	NS	0.056
	Middle	0.091	0.045	0.037	0.057	NS	0.058
	Bottom	0.099	0.039	0.036	0.048	NS	0.056
Station 3	Top	0.065	0.044	0.029	0.050	NS	0.047
	Middle	0.090	0.034	0.035	0.052	NS	0.053
	Bottom	0.060	0.049	0.025	0.041	NS	0.044
Station 4	Top	0.073	0.058	0.035	0.063	NS	0.057
	Middle	0.077	0.049	0.044	0.12	NS	0.073
	Bottom	0.068	0.045	0.031	0.075	NS	0.055
Ref - PB	Top	0.051	0.045	0.033	0.035	NS	0.041
	Middle	0.056	0.050	0.023	0.030	NS	0.040
	Bottom	0.058	0.037	0.019	0.017	NS	0.033
Ref - CB	Top	0.058	0.049	0.041	0.057	NS	0.051
	Middle	0.066	0.032	0.015	0.038	NS	0.038
	Bottom	0.044	0.047	0.032	0.034	NS	0.039
Spring							**Average**
Station 1	**Average**	0.055	0.070	0.17	0.061	0.052	0.082
	Middle	0.053	0.061	0.066	0.067	0.075	0.064
	Bottom	0.098	0.067	0.14	0.049	0.068	0.084
Station 2	Top	0.048	0.070	0.069	0.087	0.061	0.067
	Middle	0.14	0.058	0.083	0.13	0.054	0.093
	Bottom	0.14	0.068	0.098	0.13	0.055	0.098
Station 3	Top	0.043	0.065	0.079	0.069	0.057	0.063
	Middle	0.091	0.058	0.099	0.12	0.056	0.085
	Bottom	0.079	0.059	0.12	0.095	0.063	0.083
Station 4	Top	0.044	0.068	0.079	0.079	0.061	0.066
	Middle	0.041	0.070	0.068	0.087	0.060	0.065
	Bottom	0.055	0.058	0.055	0.082	0.067	0.063
Ref - PB	Top	0.059	0.063	0.057	0.053	0.056	0.058
	Middle	0.058	0.056	0.067	0.063	0.052	0.059
	Bottom	0.051	0.063	0.060	0.066	0.049	0.058
Ref - CB	Top	0.063	0.058	0.058	0.082	0.047	0.062
	Middle	0.064	0.050	0.048	0.052	0.043	0.051
	Bottom	0.053	0.055	0.060	0.056	0.067	0.058
Summer							**Average**
Station 1	Top	0.11	0.059	0.055	0.069	0.050	0.069
	Middle	0.076	0.056	0.058	0.047	0.054	0.058
	Bottom	0.075	0.078	0.12	0.052	0.057	0.076
Station 2	Top	0.063	0.059	0.045	0.067	0.057	0.058
	Middle	0.087	0.066	0.053	0.055	0.052	0.063
	Bottom	0.061	0.13	0.16	0.096	0.13	0.12
Station 3	Top	0.058	0.060	0.053	0.046	0.062	0.056
	Middle	0.077	0.070	0.051	0.047	0.058	0.061
	Bottom	0.077	0.13	0.041	0.058	0.11	0.083
Station 4	Top	0.13	0.065	0.059	0.054	0.055	0.073
	Middle	0.053	0.062	0.063	0.048	0.055	0.056
	Bottom	0.045	0.15	0.062	0.10	0.074	0.086

Appendix C7, cont'd

NH_3	BC Approved LTC WQG = 1.1 mg/L (NH_3 as N)* (average over 5 samples)						
Ref - PB	Top	0.060	0.066	0.055	0.044	0.045	0.054
	Middle	0.043	0.053	0.052	0.045	0.060	0.051
	Bottom	0.049	0.055	0.068	0.042	0.051	0.053
Ref - CB	Top	NS	0.062	0.065	0.053	0.053	0.058
	Middle	NS	0.059	0.059	0.046	0.053	0.054
	Bottom	NS	0.064	0.053	0.054	0.054	0.056
Autumn							**Average**
Station 1	Top	0.048	0.048	0.063	0.061	0.055	0.055
	Middle	0.043	0.051	0.090	0.050	0.058	0.058
	Bottom	0.050	0.046	0.12	0.028	0.039	0.057
Station 2	Top	0.066	0.046	0.061	0.054	0.052	0.056
	Middle	0.072	0.042	0.065	0.047	0.042	0.054
	Bottom	0.048	0.036	0.098	0.036	0.048	0.053
Station 3	Top	0.049	0.041	0.060	0.049	0.051	0.050
	Middle	0.15	0.060	0.048	0.053	0.12	0.086
	Bottom	0.12	0.036	0.043	0.031	0.11	0.068
Station 4	Top	0.057	0.044	0.045	0.052	0.047	0.049
	Middle	0.097	0.037	0.062	0.10	0.092	0.078
	Bottom	0.082	0.034	0.11	0.039	0.083	0.069
Ref - PB	Top	0.048	0.041	0.054	0.048	0.053	0.049
	Middle	0.059	0.040	0.050	0.042	0.046	0.047
	Bottom	0.039	0.043	0.052	0.034	0.037	0.041
Ref - CB	Top	0.058	0.037	0.069	0.052	0.054	0.054
	Middle	0.050	0.033	0.059	0.015	0.056	0.043
	Bottom	0.055	0.044	0.054	0.029	0.052	0.047

Notes:
LTC – long-term chronic
Shaded cells indicate exceedance to BC WQG, Approved Guideline
*based on salinity = 30 ppt, Temperature = 15°C and pH = 8.2
NS=not sampled

Appendix C8 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Silver (mg/L)

Silver	BC Approved WQG = 0.5 µg/L (LTC – average over 5 samples) or 3.7 µg/L (STA)						
Winter							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Station 2	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Station 3	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Station 4	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Ref - CB	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	NS	0.050
Spring							**Average**
Station 1	Top	0.056	<0.050	<0.050	<0.050	<0.050	0.051
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	0.051	<0.050	<0.050	<0.050	<0.050	0.050
Station 2	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 3	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 4	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	0.076	<0.050	<0.050	<0.050	<0.050	0.055
	Bottom	<0.050	<0.050	<0.050	0.073	<0.050	0.055
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - CB	Top	<0.050	0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Summer							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 2	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	0.054	<0.050	<0.050	0.051
Station 3	Top	<0.050	<0.050	<0.050	0.053	<0.050	0.051
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 4	Top	<0.050	<0.050	0.065	<0.050	<0.050	0.053

Appendix C8, cont'd

Silver	BC Approved WQG = 0.5 µg/L (LTC – average over 5 samples) or 3.7 µg/L (STA)						
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - CB	Top	NS	0.47	<0.050	<0.064	<0.050	0.16
	Middle	NS	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	NS	<0.050	<0.050	0.050	<0.050	0.050
Autumn							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	0.18	<0.050	<0.050	<0.050	<0.050	0.076
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 2	Top	0.14	<0.050	<0.050	<0.050	<0.050	0.067
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 3	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 4	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.15	<0.050	<0.050	0.070
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - CB	Top	0.085	<0.050	<0.050	<0.050	<0.050	0.057
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050

Notes:
LTC – long-term chronic
Shaded cells indicate exceedance to BC WQG.
Detection limit was used in calculations of average values.
NS=not sampled

Appendix C9 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Arsenic (µg/L)

Arsenic	BC Approved LTC WQG = 12.5 µg/L (average over 5 samples)						
Winter							**Average**
Station 1	Top	1.15	1.70	1.90	2.25	NS	1.75
	Middle	1.21	1.98	2.07	2.38	NS	1.91
	Bottom	1.34	1.76	1.97	2.50	NS	1.89
Station 2	Top	1.43	1.83	1.58	2.01	NS	1.71
	Middle	1.55	1.75	2.03	2.23	NS	1.89
	Bottom	1.55	1.76	1.95	2.42	NS	1.92
Station 3	Top	1.36	1.94	1.98	2.20	NS	1.87
	Middle	1.16	1.73	1.95	2.06	NS	1.73
	Bottom	1.44	2.08	1.87	2.10	NS	1.87
Station 4	Top	1.96	1.91	1.94	2.04	NS	1.96
	Middle	1.73	1.93	2.14	2.17	NS	1.99
	Bottom	1.42	1.88	2.14	2.46	NS	1.98
Ref - PB	Top	1.46	1.62	1.92	2.31	NS	1.83
	Middle	1.32	1.78	1.82	2.27	NS	1.80
	Bottom	1.39	1.44	2.36	1.97	NS	1.79
Ref - CB	Top	1.41	1.48	1.74	2.05	NS	1.67
	Middle	1.38	1.66	1.79	2.05	NS	1.72
	Bottom	1.49	1.71	1.72	2.37	NS	1.82
Spring							**Average**
Station 1	Top	1.86	1.78	1.70	1.66	2.06	1.81
	Middle	1.83	1.89	1.24	1.88	1.75	1.72
	Bottom	1.54	1.82	2.11	1.94	1.91	1.86
Station 2	Top	1.70	1.67	2.09	1.79	1.99	1.85
	Middle	1.76	2.07	2.02	1.78	1.71	1.87
	Bottom	1.90	1.49	1.74	2.18	1.86	1.83
Station 3	Top	1.63	1.81	1.96	1.97	2.07	1.89
	Middle	1.70	1.78	1.46	1.84	1.95	1.75
	Bottom	1.78	1.72	1.91	1.50	2.34	1.85
Station 4	Top	1.84	1.81	2.12	2.01	1.97	1.95
	Middle	1.80	1.57	2.05	1.88	1.83	1.83
	Bottom	1.87	2.09	1.78	1.74	2.04	1.90
Ref - PB	Top	1.57	1.85	1.73	1.82	2.10	1.81
	Middle	2.04	1.61	1.90	1.83	1.81	1.84
	Bottom	1.91	1.66	1.89	1.73	1.90	1.82
Ref - CB	Top	1.51	1.52	1.38	1.61	2.09	1.62
	Middle	1.59	1.33	1.60	1.73	2.07	1.66
	Bottom	2.05	1.94	2.03	2.07	1.98	2.01
Summer							**Average**
Station 1	Top	1.44	1.68	1.99	2.92	1.73	1.95
	Middle	1.45	2.29	1.93	2.83	1.45	1.99
	Bottom	1.06	1.81	1.61	3.72	1.79	2.00
Station 2	Top	1.14	1.68	1.70	2.91	1.69	1.82
	Middle	1.34	1.66	1.70	3.41	1.92	2.01
	Bottom	2.17	1.88	1.53	3.88	1.73	2.24
Station 3	Top	1.49	1.74	1.47	3.94	1.50	2.03
	Middle	1.58	1.68	1.74	3.56	1.78	2.07
	Bottom	1.26	1.73	1.99	3.62	1.76	2.07
Station 4	Top	1.79	1.84	2.59	4.06	1.95	2.45
	Middle	1.87	1.79	1.83	3.68	1.78	2.19
	Bottom	1.68	2.06	1.77	3.27	1.58	2.07

Appendix C9, cont'd

Arsenic	BC Approved LTC WQG = 12.5 µg/L (average over 5 samples)						
Ref - PB	Top	1.38	2.07	1.98	3.73	1.65	2.16
	Middle	1.47	2.18	1.60	3.43	1.50	2.04
	Bottom	1.61	1.80	1.64	3.90	1.32	2.05
Ref - CB	Top	NS	2.84	1.48	2.73	1.18	2.06
	Middle	NS	1.94	1.60	3.44	1.75	2.18
	Bottom	NS	1.65	2.01	3.01	1.50	2.04
Autumn							**Average**
Station 1	Top	1.51	2.34	2.26	1.94	1.51	1.91
	Middle	1.78	2.49	1.95	1.57	1.34	1.83
	Bottom	1.67	2.46	1.60	2.09	1.46	1.86
Station 2	Top	2.13	2.46	1.69	1.79	1.26	1.87
	Middle	1.88	2.08	1.80	1.72	1.56	1.81
	Bottom	1.79	1.97	1.65	1.49	1.49	1.68
Station 3	Top	1.74	2.24	1.89	1.89	1.45	1.84
	Middle	2.00	2.44	1.70	1.70	1.49	1.87
	Bottom	1.87	2.15	2.23	1.85	1.50	1.92
Station 4	Top	1.80	2.89	1.79	1.48	1.34	1.86
	Middle	1.98	2.49	1.81	1.72	1.55	1.91
	Bottom	1.99	2.80	2.05	1.24	0.97	1.81
Ref - PB	Top	1.52	2.34	1.82	1.43	1.66	1.75
	Middle	1.53	2.18	2.02	1.81	1.68	1.84
	Bottom	1.73	2.75	1.84	1.85	1.46	1.93
Ref - CB	Top	1.73	2.11	1.60	1.50	1.55	1.70
	Middle	1.90	1.86	1.36	1.70	1.96	1.76
	Bottom	1.60	2.43	2.03	1.69	1.61	1.87

Notes:
LTC – long-term chronic
Shaded cells indicate exceedance to BC WQG.
NS=not sampled

Appendix C10 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Boron (µg/L)

Boron	BC Approved LTC WQG = 1200 µg/L (average over 5 samples)						
Winter							**Average**
Station 1	Top	4130	4090	4270	3590	NS	4020
	Middle	3820	4020	4400	3850	NS	4023
	Bottom	3870	3960	4400	3890	NS	4030
Station 2	Top	3630	3790	4460	3740	NS	3905
	Middle	3860	3770	4480	3720	NS	3958
	Bottom	3890	3730	4320	3870	NS	3953
Station 3	Top	3780	3760	4200	3550	NS	3823
	Middle	3890	3930	4340	3630	NS	3948
	Bottom	4100	4030	4410	3640	NS	4045
Station 4	Top	3990	3620	4150	3600	NS	3840
	Middle	4250	3690	4260	3820	NS	4005
	Bottom	3920	3830	4540	3560	NS	3963
Ref - PB	Top	3890	3930	4520	3500	NS	3960
	Middle	3820	4000	4390	3580	NS	3948
	Bottom	3770	3900	5010	3640	NS	4080
Ref - CB	Top	3780	4130	4120	3695	NS	3931
	Middle	3895	3985	4570	3710	NS	4040
	Bottom	3660	3940	4190	3790	NS	3895
Spring							**Average**
Station 1	Top	4060	3830	3890	4090	3870	3948
	Middle	4140	3770	3670	4050	3790	3884
	Bottom	4200	3880	3820	4150	4130	4036
Station 2	Top	4250	3560	3900	4030	3800	3908
	Middle	4180	3610	3860	4030	3890	3914
	Bottom	4280	3490	3820	4020	3850	3892
Station 3	Top	4200	3860	3960	4020	4050	4018
	Middle	4170	3560	3680	3820	3780	3802
	Bottom	4200	3770	3830	4090	4000	3978
Station 4	Top	4340	3920	3810	3920	3980	3994
	Middle	4200	3650	3900	3940	3750	3888
	Bottom	4470	3800	3760	4220	3980	4046
Ref - PB	Top	4010	3670	3790	4280	4040	3958
	Middle	4130	3850	3930	4050	3860	3964
	Bottom	4120	3800	4020	3950	3900	3958
Ref - CB	Top	3855	3705	3660	3855	4245	3864
	Middle	3980	3800	3720	4000	3830	3866
	Bottom	4080	3940	3860	4580	4140	4120
Summer							**Average**
Station 1	Top	3780	4380	4130	4520	5350	4432
	Middle	3910	5100	3880	4400	4810	4420
	Bottom	3970	4190	4020	4570	5240	4398
Station 2	Top	3710	4260	4050	4220	4810	4210
	Middle	3660	4150	3760	4860	4440	4174
	Bottom	4040	4930	3970	5100	5130	4634
Station 3	Top	3950	4180	3900	4600	4900	4306
	Middle	4370	4250	4010	4950	5110	4538
	Bottom	4230	4530	4000	5060	4900	4544
Station 4	Top	4170	4370	3890	4900	5460	4558
	Middle	4450	4130	4110	4760	4920	4474
	Bottom	4010	5160	4100	4250	4990	4502

Appendix C10, cont'd

Boron	BC Approved LTC WQG = 1200 µg/L (average over 5 samples)						
Ref - PB	Top	3805	4930	3990	5060	4895	4536
	Middle	3650	4480	3940	4480	4530	4216
	Bottom	4160	4390	4000	5000	4330	4376
Ref - CB	Top	NS	4280	3560	4545	4030	4104
	Middle	NS	5130	4110	4840	4600	4670
	Bottom	NS	4490	4080	4370	4560	4375
Autumn							**Average**
Station 1	Top	3910	5040	5270	4660	4080	4592
	Middle	4365	5080	4390	4130	3820	4357
	Bottom	4260	5200	4250	4510	4210	4486
Station 2	Top	4670	5270	4070	4650	3950	4522
	Middle	4220	4640	4250	4550	4260	4384
	Bottom	4690	5030	4240	4220	3870	4410
Station 3	Top	4010	4750	4660	4300	4040	4352
	Middle	4540	4700	4550	4380	3860	4406
	Bottom	4270	5020	5100	4520	3860	4554
Station 4	Top	4580	4760	4900	3970	3530	4348
	Middle	4560	5090	4410	4420	3750	4446
	Bottom	4280	5070	4440	3900	3650	4268
Ref - PB	Top	4160	5350	4300	4470	3940	4444
	Middle	3960	5230	4910	4640	3950	4538
	Bottom	4120	5500	5260	4740	3690	4662
Ref - CB	Top	4230	5060	3825	4125	3810	4210
	Middle	4140	4740	4160	4580	3740	4272
	Bottom	4050	5400	5220	4340	4240	4650

Notes:
LTC – long-term chronic
Shaded cells indicate exceedance to BC WQG for protection of marine aquatic life.
The BC WQG for boron is above background levels in this area which are around 4.0 mg/L.
NS=not sampled

Appendix C11 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Cadmium (µg/L)

Cadmium	BC Long-Term Working WQG = 0.12 µg/L (average over 5 samples)						
Winter							**Average**
Station 1	Top	0.023	0.040	0.065	0.034	NS	0.041
	Middle	0.040	0.041	0.017	0.040	NS	0.035
	Bottom	0.045	0.065	0.024	0.048	NS	0.046
Station 2	Top	0.020	0.088	0.047	0.023	NS	0.045
	Middle	0.041	0.055	0.029	0.076	NS	0.050
	Bottom	0.064	0.051	0.020	0.050	NS	0.046
Station 3	Top	0.056	0.027	0.048	0.014	NS	0.036
	Middle	0.063	0.039	0.036	0.019	NS	0.039
	Bottom	0.050	0.062	0.032	0.020	NS	0.041
Station 4	Top	0.049	0.045	0.030	0.040	NS	0.041
	Middle	0.055	0.063	0.017	<0.010	NS	0.036
	Bottom	0.092	0.056	0.030	0.028	NS	0.052
Ref - PB	Top	0.074	0.056	0.027	0.044	NS	0.050
	Middle	0.042	0.033	0.023	<0.010	NS	0.027
	Bottom	0.053	0.078	0.048	0.086	NS	0.066
Ref - CB	Top	0.066	0.082	0.031	0.049	NS	0.057
	Middle	0.054	0.063	0.018	0.032	NS	0.042
	Bottom	0.041	0.013	0.037	0.049	NS	0.035
Spring							**Average**
Station 1	Top	0.053	0.035	0.065	0.069	0.072	0.059
	Middle	0.033	0.066	0.035	0.047	0.096	0.055
	Bottom	0.042	0.229	0.082	0.087	0.074	0.10
Station 2	Top	0.075	0.169	0.054	0.086	0.084	0.094
	Middle	0.054	0.22	0.029	0.027	0.081	0.082
	Bottom	0.10	0.045	0.058	0.067	0.043	0.063
Station 3	Top	0.041	0.078	0.035	0.066	0.11	0.065
	Middle	0.048	0.087	0.085	0.045	0.044	0.062
	Bottom	0.036	0.037	0.039	0.12	0.14	0.074
Station 4	Top	0.069	0.026	0.059	0.098	0.12	0.074
	Middle	0.068	0.045	0.085	0.019	0.081	0.060
	Bottom	0.026	0.028	0.056	0.051	0.025	0.037
Ref - PB	Top	0.073	0.033	0.043	0.066	0.045	0.052
	Middle	0.053	0.066	0.043	0.11	0.10	0.074
	Bottom	0.093	0.018	0.071	0.073	0.054	0.062
Ref - CB	Top	0.041	0.081	0.048	0.043	0.20	0.083
	Middle	0.075	0.072	0.065	0.069	0.18	0.091
	Bottom	0.060	0.041	0.032	0.051	0.10	0.057
Summer							**Average**
Station 1	Top	<0.010	0.066	0.085	0.020	0.052	0.047
	Middle	<0.010	0.065	0.090	0.046	0.025	0.047
	Bottom	<0.010	0.23	0.069	0.060	0.063	0.086
Station 2	Top	<0.010	0.049	0.040	0.060	0.076	0.047
	Middle	0.049	0.027	0.053	0.021	0.77	0.19
	Bottom	0.029	0.12	0.059	0.033	<0.010	0.050
Station 3	Top	0.034	0.048	0.081	0.052	0.046	0.052
	Middle	0.11	0.027	0.057	0.021	0.033	0.050
	Bottom	0.10	0.029	0.095	0.052	0.015	0.058
Station 4	Top	0.050	0.028	0.18	0.045	0.13	0.085
	Middle	0.063	0.059	0.15	0.043	0.088	0.080
	Bottom	0.012	0.049	0.071	0.046	0.073	0.050

Appendix C11, cont'd

Cadmium	BC Long-Term Working WQG = 0.12 µg/L (average over 5 samples)						
Ref - PB	Top	0.016	0.058	0.159	0.040	0.026	0.060
	Middle	0.021	0.087	0.037	0.079	<0.010	0.047
	Bottom	0.031	0.064	0.060	0.054	0.066	0.055
Ref - CB	Top	NS	0.16	0.0585	0.065	0.056	0.084
	Middle	NS	0.062	0.14	0.042	0.019	0.066
	Bottom	NS	0.087	0.066	0.018	0.055	0.057
Autumn							**Average**
Station 1	Top	0.068	0.020	0.12	0.082	0.051	0.068
	Middle	0.16	0.012	0.067	0.034	0.078	0.070
	Bottom	0.18	<0.010	0.11	0.25	0.081	0.13
Station 2	Top	0.76	0.012	0.057	0.062	0.045	0.19
	Middle	0.17	<0.010	0.098	0.19	0.063	0.11
	Bottom	0.12	<0.010	0.087	0.094	0.067	0.075
Station 3	Top	0.13	0.025	0.15	0.27	0.045	0.12
	Middle	0.15	<0.010	0.083	0.063	0.013	0.063
	Bottom	0.12	<0.010	0.066	0.084	0.076	0.071
Station 4	Top	0.085	0.10	0.11	0.054	0.070	0.083
	Middle	0.12	0.17	0.070	0.063	0.13	0.11
	Bottom	0.068	0.14	0.093	0.034	0.068	0.081
Ref - PB	Top	0.086	0.026	0.12	0.11	0.071	0.082
	Middle	0.091	<0.010	0.041	0.054	0.066	0.052
	Bottom	0.076	0.043	0.093	0.065	0.036	0.063
Ref - CB	Top	0.086	<0.010	0.11	0.065	0.052	0.065
	Middle	0.077	<0.010	0.050	0.026	0.033	0.039
	Bottom	0.062	0.49	0.089	0.044	0.076	0.15

Notes: Shaded cells indicate exceedance to BC WQG; Detection limit was used in the calculation of averages. NS=not sampled

Appendix C12 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Copper (µg/L)

Copper	BC Approved WQG = 2 µg/L (LTC average over 5 samples) or 3 µg/L (STA)						
Winter							**Average**
Station 1	Top	<0.50	<0.50	<0.50	<0.50	NS	0.50
	Middle	<0.50	0.74	<0.50	<0.50	NS	0.56
	Bottom	<0.50	1.69	<0.50	<0.50	NS	0.80
Station 2	Top	<0.50	3.7	<0.50	<0.50	NS	1.3
	Middle	0.54	16	<0.50	0.90	NS	4.5
	Bottom	<0.50	3.7	<0.50	<0.50	NS	1.3
Station 3	Top	<0.50	<0.50	<0.50	<0.50	NS	0.50
	Middle	0.89	<0.50	<0.50	<0.50	NS	0.60
	Bottom	<0.50	1.3	<0.50	<0.50	NS	0.70
Station 4	Top	<0.50	<0.50	<0.50	<0.50	NS	0.50
	Middle	<0.50	2.95	<0.50	<0.50	NS	1.1
	Bottom	<0.50	<0.50	<0.50	<0.50	NS	0.50
Ref - PB	Top	<0.50	2.2	<0.50	<0.50	NS	0.93
	Middle	<0.50	0.82	<0.50	<0.50	NS	0.58
	Bottom	<0.50	<0.50	<0.50	<0.50	NS	0.50
Ref - CB	Top	<0.50	<0.50	<0.50	0.60	NS	0.53
	Middle	<0.50	0.58	<0.50	1.3	NS	0.71
	Bottom	<0.50	<0.50	<0.50	<0.50	NS	0.50
Spring							**Average**
Station 1	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Station 2	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	0.55	0.51
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Station 3	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Station 4	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	0.53	0.51
Ref - PB	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Ref - CB	Top	<0.50	<0.50	0.70	<0.50	<0.50	0.54
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Summer							**Average**
Station 1	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	0.66	<0.50	<0.50	<0.50	0.53
Station 2	Top	<0.50	<0.50	2.5	<0.50	<0.50	0.90
	Middle	<0.50	<0.50	<0.50	<0.50	3.2	1.04
	Bottom	<0.50	<0.50	0.80	<0.50	<0.50	0.56
Station 3	Top	<0.50	<0.50	0.96	<0.50	<0.50	0.59
	Middle	<0.50	<0.50	0.62	<0.50	<0.50	0.52
	Bottom	1.8	<0.50	3.7	<0.50	<0.50	1.40
Station 4	Top	<0.50	<0.50	66	<0.50	<0.50	14
	Middle	<0.50	<0.50	3.3	<0.50	<0.50	1.07
	Bottom	<0.50	<0.50	1.8	<0.50	0.57	0.78

Copper	BC Approved WQG = 2 µg/L (LTC average over 5 samples) or 3 µg/L (STA)						
Ref - PB	Top	<0.50	2.1	17	<0.50	<0.50	4.2
	Middle	<0.50	1.9	2.8	<0.50	<0.50	1.2
	Bottom	<0.50	1.7	18	<0.50	<0.50	4.2
Ref - CB	Top	NS	16	2.2	<0.50	<0.50	4.7
	Middle	NS	2.2	3.3	<0.50	<0.50	1.6
	Bottom	NS	3.8	<0.50	<0.50	<0.50	1.3
Autumn							**Average**
Station 1	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	0.54	0.54	<0.50	0.51
Station 2	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Station 3	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Station 4	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	0.63	<0.50	<0.50	0.53
Ref - PB	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Bottom	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
Ref - CB	Top	<0.50	<0.50	<0.50	<0.50	<0.50	0.50
	Middle	<0.50	<0.50	0.56	<0.50	<0.50	0.51
	Bottom	<0.50	0.87	<0.50	<0.50	<0.50	0.57

Notes:
LTC – long-term chronic
STA – short-term acute
Shaded cells indicate exceedance to BC WQG, Detection limit was used in calculations of average values.
NS=not sampled

Appendix C13 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Lead (µg/L)

Lead	BC Approved WQG = 2 µg/L (LTC – average of 5 sample) or 140 µg/L (STA)						
Winter							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	1.4	<0.050	<0.050	NS	0.40
	Bottom	0.13	0.70	<0.050	<0.050	NS	0.23
Station 2	Top	<0.050	0.38	<0.050	<0.050	NS	0.13
	Middle	0.18	0.41	<0.050	<0.050	NS	0.17
	Bottom	<0.050	0.64	<0.050	<0.050	NS	0.20
Station 3	Top	<0.050	0.51	<0.050	<0.050	NS	0.17
	Middle	<0.050	0.47	<0.050	<0.050	NS	0.15
	Bottom	<0.050	0.19	<0.050	<0.050	NS	0.085
Station 4	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	0.25	<0.050	<0.050	NS	0.10
	Bottom	<0.050	0.40	<0.050	0.12	NS	0.16
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	NS	0.050
	Middle	<0.050	0.052	<0.050	<0.050	NS	0.051
	Bottom	<0.050	0.099	<0.050	0.11	NS	0.077
Ref - CB	Top	0.055	0.085	<0.050	<0.050	NS	0.060
	Middle	<0.050	0.24	<0.050	<0.050	NS	0.097
	Bottom	<0.050	0.47	<0.050	2.2	NS	0.69
Spring							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	0.13	<0.050	0.067
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 2	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	0.44	0.13
Station 3	Top	<0.050	<0.050	<0.050	0.065	<0.050	0.053
	Middle	<0.050	<0.050	<0.050	0.052	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 4	Top	<0.050	<0.050	<0.050	<0.050	0.080	0.056
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - PB	Top	<0.050	<0.050	0.12	<0.050	<0.050	0.064
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - CB	Top	<0.050	<0.050	0.91	<0.050	<0.050	0.22
	Middle	<0.050	<0.050	0.26	<0.050	0.64	0.21
	Bottom	<0.050	<0.050	5.7	<0.050	<0.050	1.2
Summer							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	0.14	<0.050	<0.050	<0.050	0.068
Station 2	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	0.42	0.12
	Bottom	<0.050	<0.050	0.15	<0.050	<0.050	0.071
Station 3	Top	<0.050	<0.050	0.11	<0.050	<0.050	0.061
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	0.064	<0.050	0.13	<0.050	<0.050	0.068
Station 4	Top	<0.050	<0.050	2.6	<0.050	<0.050	0.57
	Middle	<0.050	<0.050	0.37	<0.050	<0.050	0.11
	Bottom	<0.050	<0.050	0.26	<0.050	<0.050	0.093

Lead	BC Approved WQG = 2 µg/L (LTC – average of 5 sample) or 140 µg/L (STA)						
Ref - PB	Top	<0.050	0.076	0.28	<0.050	<0.050	0.10
	Middle	<0.050	<0.050	0.095	<0.050	<0.050	0.059
	Bottom	<0.050	0.081	<0.050	<0.050	<0.050	0.056
Ref - CB	Top	NS	0.99	0.13	<0.050	<0.050	0.31
	Middle	NS	0.095	0.14	<0.050	<0.050	0.084
	Bottom	NS	0.17	<0.050	<0.050	<0.050	0.081
Autumn							**Average**
Station 1	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	0.21	<0.050	0.082
Station 2	Top	0.50	<0.050	<0.050	<0.050	<0.050	0.14
	Middle	0.052	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	0.059	0.052
Station 3	Top	<0.050	<0.050	<0.050	0.065	<0.050	0.053
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Station 4	Top	<0.050	0.11	<0.050	<0.050	<0.050	0.063
	Middle	<0.050	0.069	<0.050	<0.050	0.17	0.077
	Bottom	<0.050	0.078	<0.050	<0.050	<0.050	0.056
Ref - PB	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ref - CB	Top	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Middle	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
	Bottom	<0.050	0.38	<0.050	<0.050	<0.050	0.12

Notes:
STA – short-term acute
Shaded cells indicate exceedance to BC WQG
Detection limit was used in calculations of average values.
NS=not sampled

Appendix C14 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Manganese (µg/L)

Manganese	BC Working Long-Term WQG = 100 µg/L (average over 5 samples)							
Winter								**Average**
Station 1	Top	1.30	1.62	1.09	1.39	NS		1.35
	Middle	1.60	1.53	1.30	1.41	NS		1.46
	Bottom	1.26	3.10	1.36	1.66	NS		1.85
Station 2	Top	0.950	4.06	0.990	1.16	NS		1.79
	Middle	1.08	3.40	1.42	1.44	NS		1.84
	Bottom	1.32	5.52	1.55	1.59	NS		2.50
Station 3	Top	1.28	2.41	1.06	1.13	NS		1.47
	Middle	1.15	1.59	1.34	1.39	NS		1.37
	Bottom	1.62	1.90	1.79	1.21	NS		1.63
Station 4	Top	1.41	1.49	1.14	0.980	NS		1.26
	Middle	1.31	1.55	1.38	1.51	NS		1.44
	Bottom	1.19	1.94	1.54	1.29	NS		1.49
Ref - PB	Top	1.10	1.53	1.29	1.41	NS		1.33
	Middle	1.33	2.00	1.34	1.19	NS		1.47
	Bottom	1.98	1.95	2.61	1.59	NS		2.03
Ref - CB	Top	0.990	1.75	1.33	1.90	NS		1.49
	Middle	1.10	2.06	1.82	1.59	NS		1.64
	Bottom	1.19	1.71	1.19	1.15	NS		1.31
Spring								**Average**
Station 1	Top	1.20	1.08	1.07	1.38	1.26		1.20
	Middle	1.25	1.06	0.900	1.43	0.940		1.12
	Bottom	1.20	2.06	0.880	1.44	1.14		1.34
Station 2	Top	1.27	1.05	0.650	1.83	1.54		1.27
	Middle	1.44	1.69	0.720	1.47	1.14		1.29
	Bottom	1.28	0.94	0.760	1.69	1.03		1.14
Station 3	Top	1.21	0.82	0.800	1.36	1.16		1.07
	Middle	1.24	0.89	0.880	1.29	1.07		1.07
	Bottom	1.12	0.67	0.890	1.56	1.28		1.10
Station 4	Top	1.58	1.04	0.910	1.21	1.36		1.22
	Middle	1.17	0.870	0.930	1.33	1.14		1.09
	Bottom	1.33	1.02	1.03	1.58	1.15		1.22
Ref - PB	Top	1.25	1.02	1.69	1.78	1.30		1.41
	Middle	1.49	0.990	0.770	1.36	1.03		1.13
	Bottom	1.45	0.950	0.990	1.21	1.85		1.29
Ref - CB	Top	1.17	1.61	0.810	1.48	1.68		1.35
	Middle	1.11	1.30	1.80	1.74	1.36		1.46
	Bottom	1.05	1.58	1.76	1.77	1.41		1.51
Summer								**Average**
Station 1	Top	0.930	1.52	2.38	1.93	1.98		1.75
	Middle	0.910	1.92	1.71	2.12	2.54		1.84
	Bottom	0.990	2.59	2.00	2.98	2.92		2.30
Station 2	Top	1.10	1.29	2.06	1.99	2.50		1.79
	Middle	1.10	1.47	1.18	1.89	2.90		1.71
	Bottom	1.18	2.20	2.37	2.14	2.65		2.11
Station 3	Top	0.970	1.80	2.42	1.99	2.31		1.90
	Middle	2.07	0.880	2.12	2.47	1.53		1.81
	Bottom	1.71	1.88	2.36	3.10	2.45		2.30
Station 4	Top	1.43	1.45	4.92	2.03	2.33		2.43
	Middle	1.18	1.01	2.47	2.27	1.92		1.77
	Bottom	1.34	2.13	3.67	2.31	2.39		2.37

Appendix C14, cont'd

Manganese	BC Working Long-Term WQG = 100 µg/L (average over 5 samples)						
Ref - PB	Top	0.970	4.52	2.85	1.91	1.64	2.38
	Middle	1.33	3.55	2.12	2.05	1.72	2.15
	Bottom	1.08	3.30	2.03	1.77	1.93	2.02
Ref - CB	Top	NS	29.65	1.89	2.53	3.02	9.27
	Middle	NS	5.38	2.68	2.17	1.98	3.05
	Bottom	NS	4.83	2.32	2.06	1.93	2.78
Autumn							**Average**
Station 1	Top	1.88	1.72	2.91	2.49	2.59	2.32
	Middle	2.34	1.84	2.66	2.03	2.29	2.23
	Bottom	1.99	1.75	2.91	2.78	2.13	2.31
Station 2	Top	2.91	1.84	2.24	2.17	2.11	2.25
	Middle	2.25	1.55	2.77	2.18	2.28	2.21
	Bottom	2.73	1.68	2.99	1.84	2.38	2.32
Station 3	Top	1.96	1.79	2.97	3.45	2.40	2.51
	Middle	2.49	1.63	2.97	1.79	2.35	2.25
	Bottom	2.08	1.71	2.92	2.19	1.82	2.14
Station 4	Top	2.19	2.55	2.79	1.81	1.67	2.20
	Middle	2.28	2.47	2.88	2.12	2.43	2.44
	Bottom	2.73	2.49	2.69	1.79	2.10	2.36
Ref - PB	Top	1.91	2.48	2.10	1.84	1.74	2.01
	Middle	1.87	1.96	2.79	2.33	3.40	2.47
	Bottom	2.14	2.13	2.87	2.19	2.03	2.27
Ref - CB	Top	1.95	2.10	2.13	2.37	2.28	2.17
	Middle	2.19	1.21	2.58	2.09	2.06	2.03
	Bottom	1.83	2.48	3.21	1.93	2.93	2.48

Notes:
Shaded cells indicate exceedance to BC WQG.
NS=not sampled

Appendix C15 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Nickel (µg/L)

Nickel	BC Working WQG = 8.3 µg/L (average over 5 samples)						
Winter							**Average**
Station 1	Top	<0.200	<0.200	<0.200	<0.200	NS	0.200
	Middle	<0.200	<0.200	<0.200	0.530	NS	0.283
	Bottom	<0.200	3.06	<0.200	0.340	NS	0.950
Station 2	Top	<0.200	4.29	<0.200	0.360	NS	1.26
	Middle	<0.200	8.77	<0.200	2.24	NS	2.85
	Bottom	<0.200	16.7	<0.200	0.240	NS	4.34
Station 3	Top	<0.200	<0.200	<0.200	2.30	NS	0.725
	Middle	<0.200	<0.200	<0.200	<0.200	NS	0.200
	Bottom	<0.200	0.34	<0.200	<0.200	NS	0.235
Station 4	Top	<0.200	<0.200	<0.200	<0.200	NS	0.200
	Middle	<0.200	4.26	<0.200	<0.200	NS	1.22
	Bottom	<0.200	<0.200	<0.200	<0.200	NS	0.200
Ref - PB	Top	<0.200	<0.200	<0.200	0.410	NS	0.253
	Middle	<0.200	<0.200	<0.200	0.420	NS	0.255
	Bottom	<0.200	<0.200	<0.200	0.400	NS	0.250
Ref - CB	Top	0.750	<0.200	<0.905	0.930	NS	0.696
	Middle	<0.200	0.260	<0.200	1.19	NS	0.463
	Bottom	<0.200	<0.200	<0.200	<0.200	NS	0.200
Spring							**Average**
Station 1	Top	<0.200	<0.200	<0.200	<0.200	0.210	0.202
	Middle	<0.200	0.810	0.260	<0.200	<0.200	0.334
	Bottom	<0.200	1.63	<0.200	<0.200	<0.200	0.486
Station 2	Top	<0.200	0.670	<0.200	<0.200	<0.200	0.294
	Middle	<0.200	1.62	0.890	<0.200	<0.200	0.622
	Bottom	<0.200	<0.200	<0.200	<0.200	<0.200	0.200
Station 3	Top	<0.200	<0.200	<0.200	<0.200	<0.200	0.200
	Middle	<0.200	<0.200	<0.200	<0.200	<0.200	0.200
	Bottom	<0.200	<0.200	<0.200	<0.200	<0.200	0.200
Station 4	Top	<0.200	<0.200	<0.200	<0.200	<0.200	0.200
	Middle	<0.200	0.330	<0.200	<0.200	<0.200	0.226
	Bottom	<0.200	0.220	<0.200	<0.200	<0.200	0.204
Ref - PB	Top	<0.200	<0.200	0.660	<0.200	<0.200	0.292
	Middle	<0.200	1.26	<0.200	<0.200	<0.200	0.412
	Bottom	<0.200	<0.200	0.260	<0.200	<0.200	0.212
Ref - CB	Top	<0.200	<0.200	0.270	<0.200	<0.200	0.214
	Middle	<0.200	<0.200	0.670	<0.200	<0.200	0.294
	Bottom	<0.200	<0.200	0.440	<0.200	<0.200	0.248
Summer							**Average**
Station 1	Top	<0.200	<0.200	0.450	<0.200	0.420	0.294
	Middle	<0.200	<0.200	1.71	<0.200	1.03	0.668
	Bottom	<0.200	<0.200	2.21	1.14	1.11	0.972
Station 2	Top	<0.200	<0.200	44.5	<0.200	0.420	9.10
	Middle	5.04	<0.200	1.23	<0.200	0.840	1.50
	Bottom	<0.200	<0.200	0.990	<0.200	0.810	0.480
Station 3	Top	<0.200	<0.200	1.66	<0.200	0.470	0.546
	Middle	<0.200	<0.200	1.60	<0.200	0.400	0.520
	Bottom	1.61	<0.200	6.03	<0.200	0.580	1.72
Station 4	Top	<0.200	<0.200	62.9	<0.200	<0.200	12.7
	Middle	<0.200	<0.200	3.38	<0.200	0.370	0.870
	Bottom	<0.200	<0.200	2.54	0.710	2.69	1.27

Nickel	BC Working WQG = 8.3 µg/L (average over 5 samples)						
Ref - PB	Top	<0.200	<0.200	9.92	<0.200	0.410	2.19
	Middle	0.850	<0.200	4.89	<0.200	0.230	1.27
	Bottom	3.90	<0.200	5.00	<0.200	0.260	1.91
Ref - CB	Top	NS	1.75	1.40	<0.200	1.34	1.17
	Middle	NS	<0.200	4.32	<0.200	0.685	1.35
	Bottom	NS	2.63	1.04	<0.200	0.355	1.06
Autumn							**Average**
Station 1	Top	0.440	<0.200	<0.200	<0.200	<0.200	0.248
	Middle	0.430	<0.200	0.460	<0.200	0.210	0.300
	Bottom	0.330	<0.200	0.380	0.470	<0.200	0.316
Station 2	Top	1.33	<0.200	<0.200	<0.200	<0.200	0.426
	Middle	0.420	<0.200	<0.200	<0.200	<0.200	0.244
	Bottom	0.520	<0.200	0.210	<0.200	<0.200	0.266
Station 3	Top	0.740	<0.200	0.240	0.220	<0.200	0.320
	Middle	0.420	<0.200	0.360	<0.200	<0.200	0.276
	Bottom	0.670	<0.200	0.360	<0.200	<0.200	0.326
Station 4	Top	0.350	0.310	<0.200	<0.200	<0.200	0.252
	Middle	0.380	<0.200	0.470	<0.200	0.600	0.370
	Bottom	0.490	<0.200	0.290	<0.200	<0.200	0.276
Ref - PB	Top	0.450	<0.200	0.390	<0.200	<0.200	0.288
	Middle	0.470	<0.200	0.230	<0.200	0.240	0.268
	Bottom	0.440	<0.200	0.350	<0.200	0.250	0.288
Ref - CB	Top	0.460	<0.200	0.340	<0.200	<0.200	0.280
	Middle	0.520	<0.200	<0.200	<0.200	<0.200	0.264
	Bottom	0.340	0.320	0.440	<0.200	0.230	0.306

Notes:
Shaded cells indicate exceedance to BC WQG.
NS=not sampled

Appendix C16 McLoughlin Point IDZ Results - 5 Sampling Events in 30 Days – Zinc (µg/L)

Zinc	BC Approved WQG = 10 µg/L (average over 5 samples) or 55 µg/L (max)							
Winter								**Average**
Station 1	Top	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Bottom	<3.00	51.1	<3.00	<3.00	NS		15.0
Station 2	Top	<3.00	68.9	<3.00	<3.00	NS		19.5
	Middle	<3.00	35.4	<3.00	4.9	NS		11.6
	Bottom	<3.00	16.0	<3.00	<3.00	NS		6.25
Station 3	Top	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Bottom	<3.00	<3.00	<3.00	<3.00	NS		3.00
Station 4	Top	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Bottom	<3.00	<3.00	<3.00	<3.00	NS		3.00
Ref - PB	Top	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Bottom	10.4	<3.00	<3.00	<3.00	NS		4.85
Ref - CB	Top	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	NS		3.00
	Bottom	<3.00	<3.00	<3.00	<3.00	NS		3.00
								Average
Station 1	Top	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Middle	<3.00	44.3	<3.00	<3.00	<3.00		11.26
	Bottom	<3.00	83.7	<3.00	<3.00	<3.00		19.14
Station 2	Top	<3.00	39.2	<3.00	<3.00	<3.00		10.24
	Middle	<3.00	81.9	<3.00	<3.00	<3.00		18.78
	Bottom	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
Station 3	Top	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Bottom	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
Station 4	Top	6.60	<3.00	<3.00	<3.00	<3.00		3.72
	Middle	<3.00	15.2	<3.00	<3.00	<3.00		5.44
	Bottom	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
Ref - PB	Top	<3.00	<3.00	12.5	<3.00	<3.00		4.90
	Middle	<3.00	52.7	<3.00	<3.00	<3.00		12.94
	Bottom	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
Ref - CB	Top	<3.00	3.80	4.45	<3.00	<3.00		3.45
	Middle	<3.00	6.60	15.5	<3.00	<3.00		6.22
	Bottom	<3.00	<3.00	13.3	<3.00	<3.00		5.06
Summer								**Average**
Station 1	Top	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Bottom	<3.00	<3.00	<3.00	<3.00	4.20		3.24
Station 2	Top	<3.00	<3.00	<3.00	<3.00	<3.00		3.00
	Middle	<3.00	<3.00	<3.00	<3.00	25.7		7.54
	Bottom	<3.00	<3.00	6.20	<3.00	7.40		4.52
Station 3	Top	<3.00	<3.00	21.8	<3.00	14.0		8.96
	Middle	5.10	<3.00	<3.00	<3.00	8.90		4.60
	Bottom	106	<3.00	3.40	<3.00	7.60		24.60
Station 4	Top	<3.00	<3.00	35.9	<3.00	7.70		10.52
	Middle	<3.00	<3.00	30.7	<3.00	4.20		8.78
	Bottom	<3.00	<3.00	26.9	31.6	4.50		13.80

Zinc	BC Approved WQG = 10 µg/L (average over 5 samples) or 55 µg/L (max)						
Ref - PB	Top	4.45	10.7	13.6	<3.00	<3	6.95
	Middle	<3.00	7.40	<3.00	<3.00	<3	3.88
	Bottom	<3.00	5.10	4.80	<3.00	6.65	4.51
Ref - CB	Top	NS	61.1	4.90	<3.00	4.30	18.33
	Middle	NS	7.40	242	<3.00	6.00	64.60
	Bottom	NS	123	18.2	<3.00	3.00	36.80
Autumn							**Average**
Station 1	Top	<3.00	<3.00	<3.00	12.8	<3.00	4.96
	Middle	<3.00	<3.00	<3.00	<3.00	<3.00	3.00
	Bottom	<3.00	<3.00	<3.00	135	<3.00	29.4
Station 2	Top	<3.00	<3.00	<3.00	<3.00	<3.00	3.00
	Middle	<3.00	<3.00	<3.00	35.3	<3.00	9.46
	Bottom	<3.00	<3.00	<3.00	5.00	<3.00	3.40
Station 3	Top	<3.00	<3.00	<3.00	103	<3.00	23.0
	Middle	<3.00	<3.00	<3.00	7.50	<3.00	3.90
	Bottom	<3.00	<3.00	<3.00	17.6	<3.00	5.92
Station 4	Top	<3.00	<3.00	<7.30	<3.00	<3.00	3.86
	Middle	<3.00	<3.00	<3.00	4.00	<3.00	3.20
	Bottom	<3.00	<3.00	<3.00	14.0	<3.00	5.20
Ref - PB	Top	<3.00	<3.00	<3.00	<3.00	<3.00	3.00
	Middle	4.00	3.50	<3.00	<3.00	<3.00	3.30
	Bottom	<3.00	<3.00	<3.00	<3.00	<3.00	3.00
Ref - CB	Top	5.90	<3.00	<3.00	<3.00	<3.00	3.58
	Middle	9.60	<3.00	<3.00	<3.00	<3.00	4.32
	Bottom	<3.00	4.40	<3.00	<3.00	<3.00	3.28

Notes:
Shaded cells indicate exceedance to BC WQG.
Detection limit was used in calculations of average values.
NS=not sampled

Appendix C17 CTD Plots

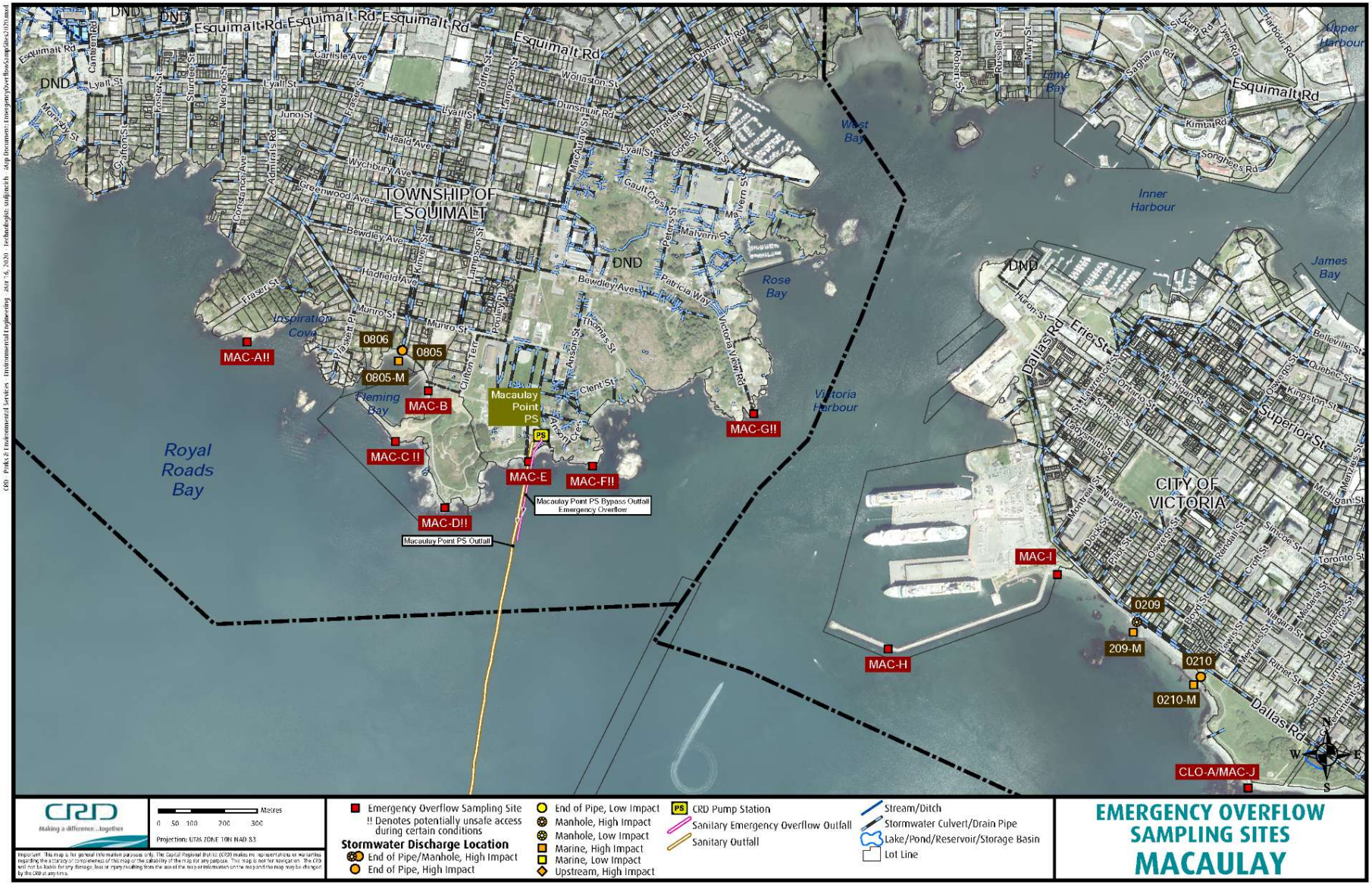
CTD plots are retained in digital storage by the CRD and are available upon request.
Contact: CRD's Environmental Monitoring Program, 250.360.3082

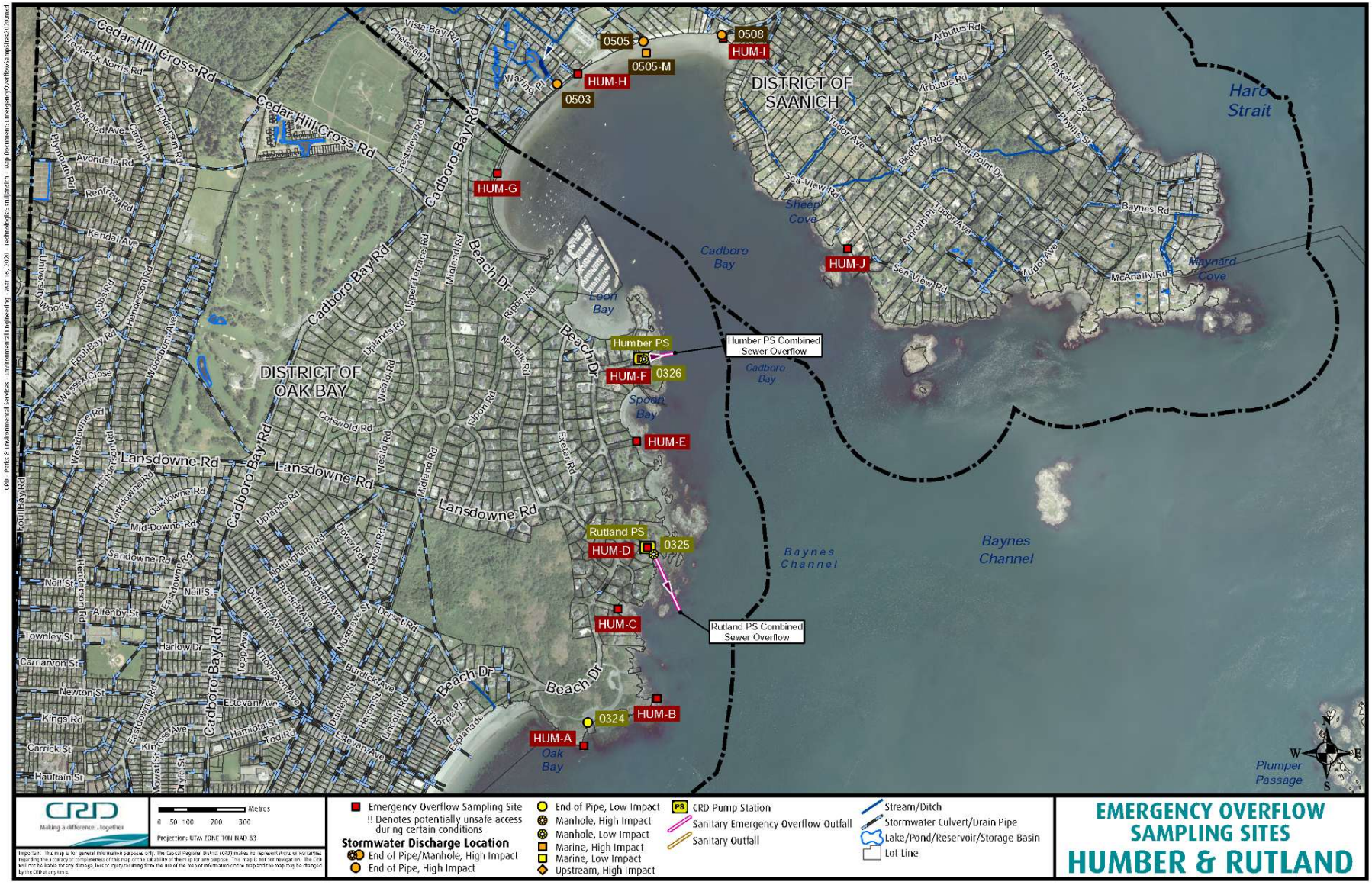
APPENDIX D
2025 SHORELINE, OVERFLOW AND BYPASS MONITORING

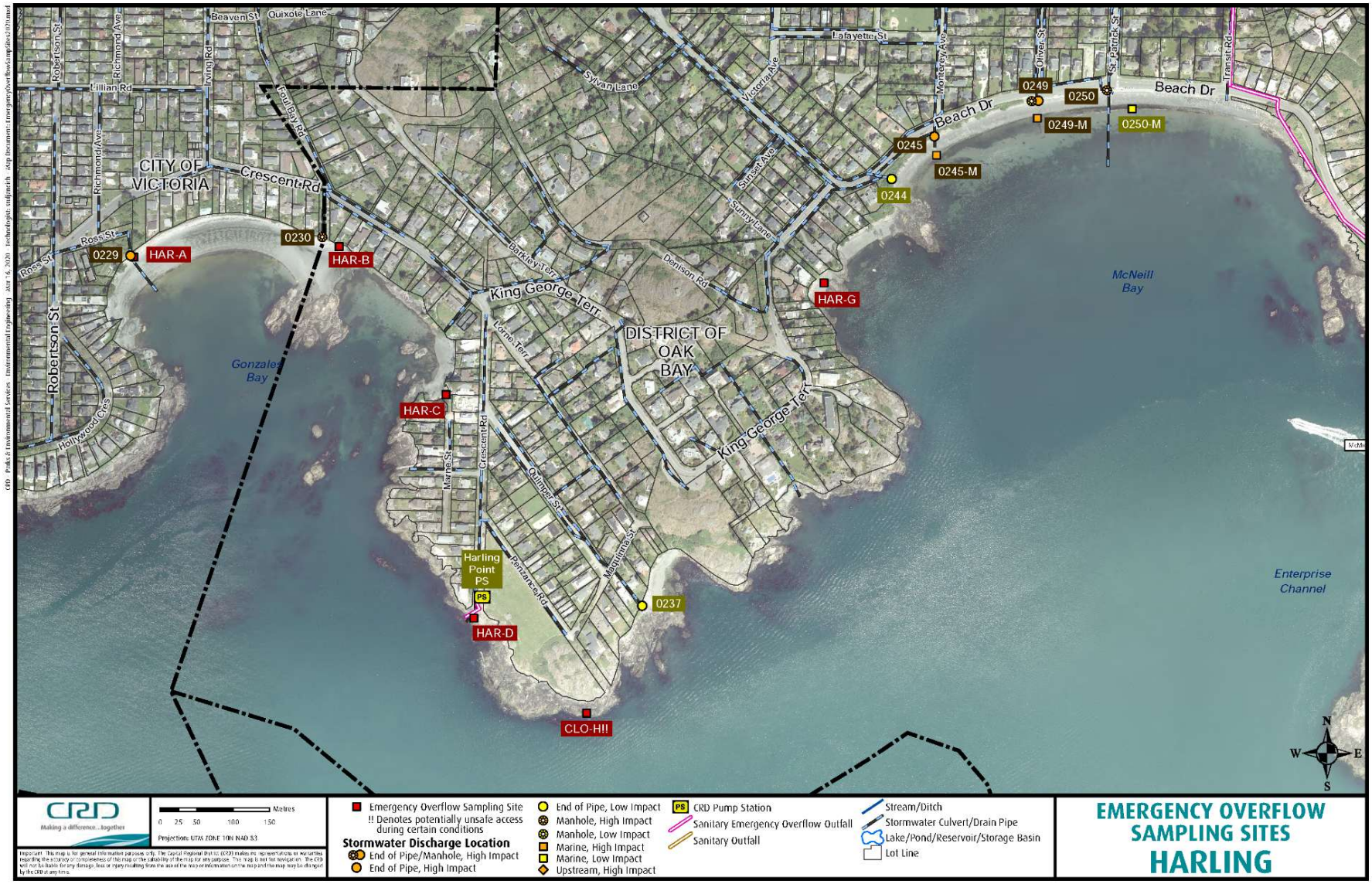
Appendix D1 Overflow and Bypass Sampling Maps

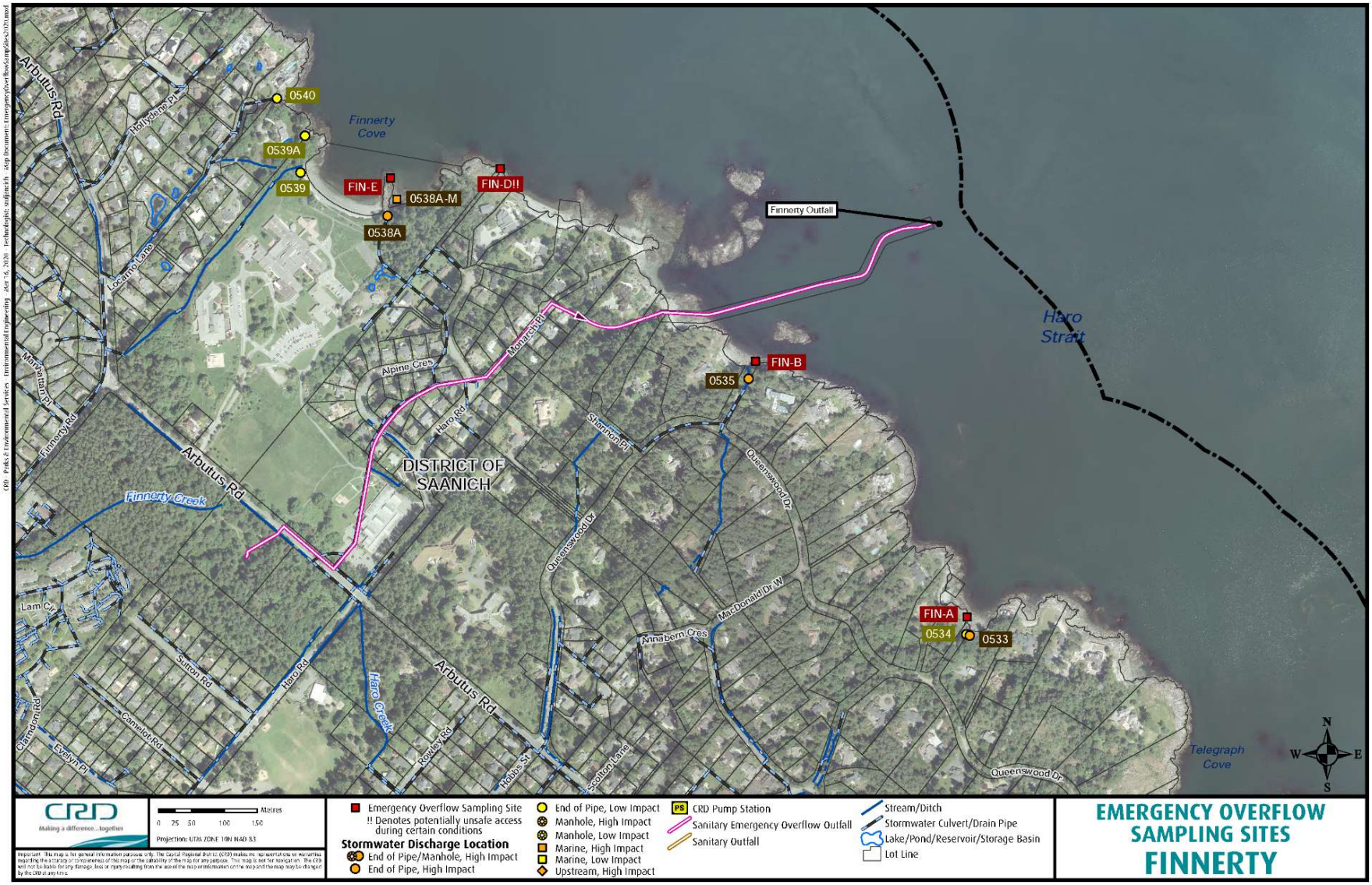
Appendix D1 Overflow and Bypass Sampling Maps




TOWNSHIP OF ESQUIMALT
CITY OF VICTORIA
Royal Roads Bay
Fleming Bay
Inspiration Cove
Rose Bay
Victoria Harbour
Inner Harbour
West Bay
Lime Bay
James Bay
Upper Harbour
MAC-A!!
MAC-B
MAC-C !!
MAC-D!!
MAC-E
MAC-F!!
MAC-G!!
MAC-H
MAC-I
0805
0806
0805-M
0209
209-M
0210
0210-M
CLO-A/MAC-J
Macaulay Point PS
Macaulay Point PS Bypass Outfall Emergency Overflow
Macaulay Point PS Outfall
Esquimalt Rd
Dallas Rd
Douglas St
Quadra St
Cook St
Fort St
Yates St
Johnson St
Government St
Wharf St
Belleville St
Quebec St
Kingston St
Superior St
Toronto St
DND
Emergency Overflow Sampling Site
!! Denotes potentially unsafe access during certain conditions
Stormwater Discharge Location
End of Pipe/Manhole, High Impact
End of Pipe, High Impact
End of Pipe, Low Impact
Manhole, High Impact
Manhole, Low Impact
Marine, High Impact
Marine, Low Impact
Upstream, High Impact
CRD Pump Station
Sanitary Emergency Overflow Outfall
Sanitary Outfall
Stream/Ditch
Stormwater Culvert/Drain Pipe
Lake/Pond/Reservoir/Storage Basin
Lot Line
Metres
0 50 100 200 300
Projection: UTM ZONE 10N NAD 83
EMERGENCY OVERFLOW SAMPLING SITES
MACAULAY


0505
0505-M
0503
0508
HUM-I
HUM-H
HUM-G
HUM-J
HUM-F
0326
HUM-E
HUM-D
0325
HUM-C
HUM-B
0324
HUM-A
Humber PS
Humber PS Combined Sewer Overflow
Rutland PS
Rutland PS Combined Sewer Overflow
DISTRICT OF SAANICH
DISTRICT OF OAK BAY
Haro Strait
Cadboro Bay
Baynes Channel
Plumper Passage
Oak Bay
Sheep Cove
Maynard Cove
Cedar Hill Cross Rd
Cadboro Bay Rd
Beach Dr
Lansdowne Rd
Arbutus Rd
Tudor Ave
Bedford Rd
Sea View Rd
Baynes Rd
McAnally Rd
Emergency Overflow Sampling Site
!! Denotes potentially unsafe access during certain conditions
Stormwater Discharge Location
End of Pipe/Manhole, High Impact
End of Pipe, High Impact
End of Pipe, Low Impact
Manhole, High Impact
Manhole, Low Impact
Marine, High Impact
Marine, Low Impact
Upstream, High Impact
CRD Pump Station
Sanitary Emergency Overflow Outfall
Sanitary Outfall
Stream/Ditch
Stormwater Culvert/Drain Pipe
Lake/Pond/Reservoir/Storage Basin
Lot Line
EMERGENCY OVERFLOW SAMPLING SITES
HUMBER & RUTLAND


CITY OF VICTORIA
DISTRICT OF OAK BAY
Gonzales Bay
McNeill Bay
Enterprise Channel
Robertson St
Richmond Ave
Irving Rd
Beaven St
Quixote Lane
Lillian Rd
Foul Bay Rd
Crescent Rd
Ross St
Hollywood Cres
Sylvan Lane
Victoria Ave
Lafayette St
Monterey Ave
Dryden St
St. Patrick St
Transit Rd
Beach Dr
Sunset Ave
Sunny Lane
Denison Rd
Barkley Terr
King George Terr
Terrace Terr
Marine St
Cluny Pl
Cluxton St
Mayfair Pl
Mayfield Pl
Mayneline St
Penzance Rd
0229
HAR-A
0230
HAR-B
0244
0245
0245-M
0249
0249-M
0250
0250-M
HAR-G
HAR-C
Harling Point PS
PS
HAR-D
0237
CLO-HI!
N
W
E
S
Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83
Emergency Overflow Sampling Site
!! Denotes potentially unsafe access during certain conditions
Stormwater Discharge Location
End of Pipe/Manhole, High Impact
End of Pipe, High Impact
End of Pipe, Low Impact
Manhole, High Impact
Manhole, Low Impact
Marine, High Impact
Marine, Low Impact
Upstream, High Impact
CRD Pump Station
Sanitary Emergency Overflow Outfall
Sanitary Outfall
Stream/Ditch
Stormwater Culvert/Drain Pipe
Lake/Pond/Reservoir/Storage Basin
Lot Line
EMERGENCY OVERFLOW SAMPLING SITES
HARLING


0540
0539A
0539
FIN-E
0538A-M
0538A
FIN-D!!
Finnerty Outfall
FIN-B
0535
FIN-A
0534
0533
Finnerty Cove
Haro Strait
Telegraph Cove
DISTRICT OF SAANICH
Arbutus Rd
Finnerty Creek
Haro Creek
Holyrood Pl
Locarno Lane
Manhattan Pl
Finnerty Rd
Alpine Cres
Monarch Rd
Haro Rd
Shanton Pl
Queenswood Dr
MacDonald Dr W
Annabern Cres
Lam Cr
Sutton Rd
Clarendon Rd
Camelot Rd
Evelyn Pl
Rowley Rd
Hobbs St
Scotton Lane
N
S
W
E
Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83
Emergency Overflow Sampling Site
!! Denotes potentially unsafe access during certain conditions
Stormwater Discharge Location
End of Pipe/Manhole, High Impact
End of Pipe, High Impact
End of Pipe, Low Impact
Manhole, High Impact
Manhole, Low Impact
Marine, High Impact
Marine, Low Impact
Upstream, High Impact
CRD Pump Station
Sanitary Emergency Overflow Outfall
Sanitary Outfall
Stream/Ditch
Stormwater Culvert/Drain Pipe
Lake/Pond/Reservoir/Storage Basin
Lot Line
EMERGENCY OVERFLOW SAMPLING SITES
FINNERTY


Bowker Ave
Cadboro Bay Rd
Cranmore Rd
Bowker Creek
DISTRICT OF OAK BAY
Hampshire Rd
Cubbon Dr
Monterey Ave
Somass Dr
Shady Lane
Broom Rd
Theatre Lane
Oak Bay Ave
Beach Dr
Dalhousie St
Cavendish Ave
Bowker Pl
unnamed lane
Oak Bay
Baynes Channel
0320
0320-M
BOW-J
0319
0318-M
0318
0317
0317-M
BOW-I
0316-1A
0316-1B
0316-1C
0316
BOW-B
0315
0315-M
BOW-A
BOW-K
Emergency Overflow Sampling Site
!! Denotes potentially unsafe access during certain conditions
Stormwater Discharge Location
End of Pipe/Manhole, High Impact
End of Pipe, High Impact
End of Pipe, Low Impact
Manhole, High Impact
Manhole, Low Impact
Marine, High Impact
Marine, Low Impact
Upstream, High Impact
CRD Pump Station
Sanitary Emergency Overflow Outfall
Sanitary Outfall
Stream/Ditch
Stormwater Culvert/Drain Pipe
Lake/Pond/Reservoir/Storage Basin
Lot Line
EMERGENCY OVERFLOW SAMPLING SITES
BOWKER

APPENDIX E
SEAFLOOR MONITORING DATA

Appendix E Seafloor Monitoring Data

Seafloor monitoring data including sediment chemistry, sediment toxicity and sediment benthic invertebrate assemblages results will be reported in the Core Area Environmental Monitoring Program Comprehensive Review in 2027.

APPENDIX F

MCLOUGHLIN POINT WASTEWATER TREATMENT PLANT BYPASS SUMMARY REPORT

McLoughlin Point Wastewater Treatment Plant

Bypass Summary Report

March 26-April 14, 2025

Capital Regional District | Parks, Recreation & Environmental Services, Environmental Protection

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Executive Summary

The Capital Regional District (CRD) requested and was granted provincial and federal authorization for a 21-day bypass of secondary and tertiary treatment processes while completing system maintenance on the McLoughlin Point Wastewater Treatment Plant. The bypass took place over 20 days from March 26 to April 14, 2025.

Effluent quality during the bypass was generally equivalent to primary treatment, and returned to equivalent to tertiary within days of bypass completion. As expected, receiving environment monitoring confirmed low risk to human health (i.e., primary contact recreation) and aquatic life, and moderate risk to shellfish harvesters. All risks were reduced immediately after bypass completion.

The CRD is currently updating the treatment plant operating, maintenance and upgrade plans to identify ways to minimize the need for future bypasses. These plans will be available by September 2025.

Introduction

The CRD requested and was granted permission for a 21-day bypass of secondary and tertiary treatment processes while completing system maintenance on the McLoughlin Point Wastewater Treatment Plant (MPWWTP; provincial discharge authorization RE-108831). Bypass authorizations were granted by Environment and Climate Change Canada (Appendix 1) under the Wastewater Systems Effluent Regulations (WSER) and by the British Columbia Ministry of Environment and Parks (ENV) (Appendix 2) under the Municipal Wastewater Regulation (MWR). First Nations and the public were also provided an opportunity to comment on the bypass plans prior to the work.

The bypass occurred over 20 days (March 26, 2025 to April 14, 2025) in order to clean the dirty backwash tank (DBWT) that is used to hold water from the biological aerated filters (used in the secondary treatment) and disk filters (used in the tertiary treatment). Due to the hydraulic configuration of the plant, the effluent could not move through the secondary (moving bed biofilm reactors and biological aerated filters) and tertiary (disk filters) treatment processes while the cleaning took place. All other registered treatment works were in operation and the bypass effluent was discharged through the 1,925 m long (60 m depth) outfall into the fast-moving waters of the Salish Sea (Straight of Juan de Fuca), away from the shoreline, creeks and salmon spawning habitat.

To minimize potential environmental and human health impacts, the bypass was scheduled outside the typical salmon spawning window and during the cooler rainy season when recreational activities are typically less common. Impacts were predicted to be low to moderate based on previous CRD receiving environment monitoring that has taken place over several decades, and oceanographic modelling of effluent plume dilution and dispersion. This oceanographic model was previously used to predict far-field plume impacts during the Environmental Impact Study (EIS) (HRP, 2019; available upon request) undertaken as part of the initial MWR registration process for the MPWWTP. The bypass was assumed to roughly correspond to modelled Scenario 2, where there is discharge through only the McLoughlin outfall (flows up to 4xADWF when McLoughlin is discharging primary + tertiary blended effluent) (Lorax, 2019). With this modeled scenario, the far-field site with the highest fecal bacteria concentration is Trial Island, with exposure at Chatham/Discovery low, and negligible at Ogden, Cook and Haystock. The historical monitoring indicated that the bypass wastewater plume would be predominantly trapped below the ocean surface, with low potential for slightly elevated bacterial concentrations above human health recreational guidelines in surface waters. Shellfish harvesting guideline exceedances, however, were predicted immediately adjacent to the outfall, but not at potential far-field harvesting locations (as per predictions from the oceanographic modelling).

Because primary treatment continued during the bypass, and receiving environment minimum initial dilution is so high, no exceedances of water quality guidelines for the protection of human health or aquatic life were expected, except for the bacteriological indicators noted above. As such, there was very low potential for adverse effects to marine organisms.

This report has been prepared to satisfy requirements of both the provincial and federal authorizations for the bypass (Appendix 1 and 2).

Bypass Information

The bypass took place from 07:00 March 26, 2025 to 15:00 April 14, 2025, a duration of 20 days or 464 hours, within the 21-day and 504 hour durations allowed in the bypass authorizations. To ensure the bypass was expedited, the cleaning crew worked 24 hours per day and 7 days per week.

During the bypass, wastewater continued to receive screening, grit removal and primary treatment, through either the primary plate settlers or Densadeg clarifiers. These treatment processes ensured that debris, solids, conventional wastewater parameters (e.g., carbonaceous biochemical oxygen demand [CBOD] and total suspended solids [TSS]), and other organic and inorganic contaminants were partially reduced prior to discharge out the marine outfall. The contents of the DBWT (approximately 104,000 kg of Biolite media) were cleaned out and sent to Hartland Landfill as controlled waste. Due to the window of opportunity provided by the DBWT cleaning bypass, additional cleaning, maintenance and inspection activities were undertaken to reduce the need for future bypasses (Table 1).

Table 1 Cleaning, maintenance and inspection activities undertaken throughout the bypass

Location/Equipment	Activity
Dirty backwash tank	• Removed 104,220 kg of Biolite and disposed of in landfill • Repaired damaged concrete and re-coated with sealant • Upgraded pump guiderail system • Rebuilt pump 12 • Replaced mixer 14 propeller
Biological aerated filters	• Inspected subfloor
Clean water tank	• Cleaned and inspected the tank • Replaced the C2A system tank discharge valve
Sludge holding tank	• Cleaned the tank • Swapped out pump 13
Electrical system	• Serviced 85% of secondary distribution system • Serviced 85% of tertiary distribution system
Plant drain tank	• Cleaned and inspected the tank • Inspected pumps • Flushed drain tank lines

The DBWT cleaning and other maintenance works were completed by April 12, and the biological aerated filters were brought back online sequentially over the subsequent two days. Full secondary and tertiary treatment processes were restored on April 14, though it was expected that effluent quality would take days to weeks to return to pre-bypass quality and compliance with provincial and federal effluent quality limits.

Effluent quality and receiving environment monitoring was undertaken before, during and after the bypass to confirm the efficacy of the primary treatment processes, the predicted low risk to human health and the environment, and when effluent quality returned to tertiary levels. The receiving environment monitoring data was also used to validate the oceanographic plume dispersion and dilution model.

Communications with First Nations and Community

Prior to the bypass, the CRD notified all First Nations with an interest in the area about the bypass through emailed letters. The CRD First Nations Relations team ensured all the Nations that have an interest in that area of the Salish Sea and surrounding lands were included. BC ENV also contacted the same Nations.

The following First Nations communities were contacted:

- Halalt
- SȾÁUTW̱
- Tseycum
- BOḰEĆEN
- W̱JOŁEŁP
- xʷsepsum
- Songhees
- Tsu'uubaa-asatx
- Lyackson
- Stz'uminus
- Spune'luxutth
- Cowichan
- Sc'ianew First Nation,
- T'Sou-ke Nation
- Malahat Nation

CRD staff received a response from SȾÁUTW̱ Nation stating that they would defer any comments to Songhees and xʷsepsum Nations. Appendix 3 presents all related First Nations correspondence.

CRD staff met with Songhees First Nation on February 12, 2025, to discuss the bypass and environmental monitoring plans. During this meeting, information was also shared about the CRD's *in situ* bacteriological monitoring device and the potential for its deployment during or after the bypass. Recent wastewater and stormwater monitoring and outfall plume dilution model summary reports were shared. As a result of these discussions, the CRD added another far-field monitoring location to the monitoring plan to address Songhees Nation concerns at that location. A member of the Songhees Nation also participated in one of the boat sampling events that occurred during the bypass.

CRD staff also met with the neighbouring community through the Esquimalt Liaison Committee. At this meeting, public concerns were related to odours and increased traffic around the plant during the bypass.

The CRD posted website alerts in January 2025 prior to the bypass event for approximately 4 weeks and again on March 19, 2025, for the duration of the bypass. These alerts appeared on the home page of the CRD website, the Esquimalt Community page and the Core Area Wastewater page. CHEK news also reported on the planned bypass on January 14, 2025.

Table 2 presents all inquiries and complaints that were received during the bypass. A total of one inquiry and five complaints were received.

Table 2 Inquiries and Complaints

Date	Inquiry or Complaint
April 1, 2025	Inquiry re: "scheduled sewage clean up"
April 3, 2025	Odour complaint
April 4, 2025	One noise complaint and one noise, odour, light complaint
April 7, 2025	Noise complaint
April 14, 2025	Odour complaint

Wastewater & Receiving Environment Monitoring

Both effluent quality and receiving environment monitoring were undertaken before, during and after the bypass.

Effluent Sampling Methods

Effluent flow volumes were measured continuously (every few minutes) by a SCADA system at the MPWWTP final effluent sampling location, and incremental values were totalized for each day of the bypass. The daily effluent flow volumes were compared to the total bypass volume limit of 2,761,500 m^3 specified in the federal bypass authorization.

Final effluent samples were taken as 24-hour flow-based composite samples as required by provincial and federal regulations. After collection, samples were immediately dispatched to two CALA (Canadian Association for Laboratory Certification) certified laboratories to conduct chemical analyses (Bureau Veritas Laboratories [BV Labs, Burnaby, BC] and the in-house MPWWTP Laboratory). Results were compared to the effluent quality limits specified in the provincial bypass authorization (i.e., CBOD and TSS not to exceed 230 mg/L) and the routine provincial and federal effluent quality limits in the MPWWTP MWR registration and WSER, respectively.

Toxicity testing using rainbow trout and *Daphnia magna* were also conducted as part of the routine and regularly scheduled monitoring program on March 20 and April 28 (i.e., before and after, but not during, the bypass) by Nautilus Environmental (Calgary, Alberta) using final effluent grab samples using method EPS 1/RM/50. No toxicity tests were conducted during the bypass as it was not a requirement of the bypass authorizations.

Receiving Environment Sampling

Environmental monitoring was conducted along a gradient from the end of the outfall, including stations located at the surface of the water around the outfall, at the edge of the initial dilution zone (IDZ), and at six far-field stations. The IDZ is an area that encompasses 100 m around the marine outfall diffuser, from the surface to the seabed. Analytes and sampling frequency varied depending on location.

Surface Water and IDZ Methods

During each surface water and IDZ sampling event, staff collected water samples for bacteriological analysis five times in 30 days (5-in-30) as part of the routine and regularly scheduled quarterly MPWWTP outfall monitoring program. This regularly scheduled sampling happened to coincide with both during and after the bypass, with sampling taking place on April 3, 9 and 15 (during bypass) and April 22 and 29 (after bypass). On each of the sampling days, marine water samples were collected at 14 surface stations surrounding the IDZ, two reference stations, and at several depths at the edge of the IDZ (Figure 1). Sampling was conducted using the University of Victoria's 16-metre science vessel, the MSV John Strickland.

Surface water was sampled at a depth of 1 m using a sampling pole at each surface station presented in Figure 1. Samples were sent to BV Labs in Burnaby, British Columbia for analysis of *enterococci* and fecal coliforms.

To determine which IDZ stations were to be sampled on any given sampling day, the predicted current direction and plume trapping depth were determined using the CRD's hydrodynamic C3 model. The model incorporates local conditions (historic instrument data and current and tide tables) to estimate current direction and effluent trapping depth (Hodgins, 2006). The four target IDZ stations and the "middle" sampling depth were then selected such that they fell within the plume's model-predicted direction of travel and trapping depth for that specific day and time. IDZ sampling was then conducted using a Seabird ECO55

rosette sampler with a SBE19PlusV2 conductivity-temperature-depth (CTD) instrument. The CTD was also equipped with a SBE43 dissolved oxygen sensor.

Water column instrument profiles were taken at each IDZ station and water column samples were taken at the top (at a depth of 5 m), middle (middle of predicted plume trapping depth, typically around 40 m deep), and bottom (5 m above the seafloor, typically around 55 m deep) of the water column. CTD profiles included instrument measurements of depth, conductivity, salinity, temperature and dissolved oxygen. Rosette bottle samples were decanted into sample bottles and preserved as necessary. Bacteriological indicators, ammonia/nitrate/nitrite, hardness, metals, total suspended solids and pH were analyzed for each of the 5-in-30 cruise days, with additional analysis of oil and grease, sulfide/sulphate, orthophosphate, and total organic carbon on samples collected from only one of the sampling days (April 15; during the bypass). All sample analyses were conducted by BV Labs.

Bacteriological results were evaluated against the historical human health guidelines developed by the BC ENV (BCMoE&CCS 2021a; 2021b) for recreational primary contact (for informational purposes only) and to Health Canada (2024) guidelines for recreational water quality. The Health Canada guidelines for *enterococci* are:

- *Enterococci* geometric mean of five samples taken 5 times in 30 days, should not exceed 35 CFU/100 mL; and
- Single enterococci values should not exceed 70 CFU/100 mL.

Bacteriological results were also compared to Canadian Shellfish Sanitation Program (CSSP) guidelines for shellfish harvesting (CSSP, 2022), which require that:

- The geometric mean of fecal coliform results not exceed 14 CFU/100 mL; and
- Not more than 10% of the sample results exceed 43 CFU/100 mL.

All other IDZ water column results were evaluated against Approved BC Water Quality Guidelines for the Protection of Aquatic Life (BCMoE&CCS 2021a; 2021b).

Far Field Methods

For the far-field sampling, there were four sampling events: one approximately one week prior to the bypass (March 17), two during the bypass (March 31, April 14), and one approximately one week after the bypass (April 23), all at various tidal cycles.

Samples were collected from a 5 m research vessel at the five far field locations identified by Lorax (2019) that were assessed during the original MPWWTP Environmental Impact Study (Ogden Point, Haystack Islets, Foot of Cook Street and Trial Island), plus one additional location of interest to the Songhees First Nation (Esquimalt Harbour) (Figure 1).

Samples were collected from 1 m below the surface, and in the middle of the water column, using a vertical Niskin bottle sampler, and analyzed for fecal coliforms and *enterococci* at BV Labs. Surface water (1 m) samples were also sent for bacterial source tracking (BST) analysis to determine the origin of the gut bacteria (i.e. human, dog, gull, or Canada Goose). Bacterial source tracking samples were analysed at Microbial Insights (Knoxville, TN, USA).

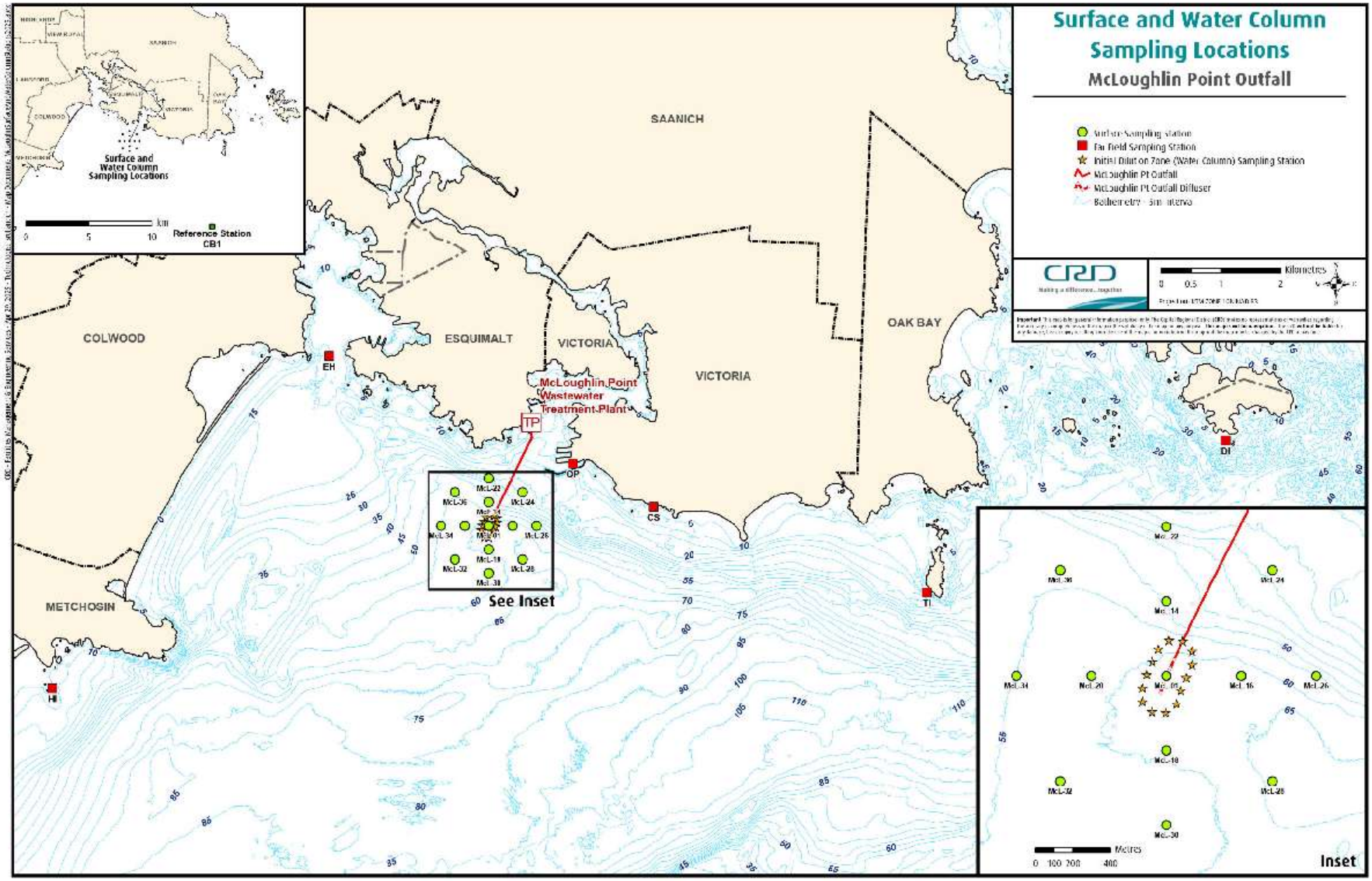


Figure 1 Surface Water, IDZ and Far Field Monitoring Stations

Results

Wastewater Effluent

Flow data are presented in Appendix 4 and wastewater analytical results in Appendices 5 and 6 (during and post-bypass, respectively). Appendix 7 contains the pre- and post-bypass toxicity test results. A summary of the results follows:

- Duration and flow
  - The provincial authorization allowed for a 21-day (504 hours) bypass. The bypass duration was only 20 days (464 hours).
  - An average of 106,844 m^3/day of primary treated effluent was discharged throughout the bypass (Appendix 4).
  - The federal bypass authorization allowed the CRD to discharge a total volume of up to 2,761,500 m^3 of primary treated effluent during the bypass. The total bypass volume was less than this limit at 2,136,861 m^3.
- Effluent quality
  - The provincial authorization stipulated that TSS and CBOD not exceed 230 mg/L. There were no wastewater results that exceeded this limit (Figure 2, Appendix 5).
  - Effluent quality was also generally within "primary" effluent quality limits (i.e., CBOD and TSS ≤130 mg/L as per the MWR) (Figure 2, Appendix 5). TSS remained below 130 mg/L throughout the bypass, with a maximum of 102 mg/L on April 12. However, there were five CBOD measurements exceeding 130 mg/L during the bypass with a maximum of 156 mg/L on April 8.
  - The average TSS and CBOD concentrations were 78 mg/L and 110 mg/L respectively (Appendix 5).
  - One exceedance of the un-ionized ammonia standard occurred on April 8 during the bypass (Appendix 5). The un-ionized ammonia concentration was 1.26 mg/L, marginally above the WSER guideline of 1.25 mg/L. The remaining measurements during this bypass were less than 1.0 mg/L.
  - The average fecal coliform concentration in wastewater discharged to the marine receiving environment during the bypass (*n*=2) was 4,650,000 CFU/100 mL (Appendix 5). After application of a minimum initial dilution of 113:1 (Lorax, 2019), concentrations of 41,150 CFU/100 mL would be expected in the initial dilution zone (IDZ). The highest concentration of fecal coliforms found in the IDZ was 1,100 CFU/100 mL on April 15 (Appendices 9 and 10), one day after the bypass concluded, which represents a dilution factor of 4,227:1, well above the minimum initial dilution factor.
  - It was expected that effluent quality would take days to weeks to stabilize post-bypass due to the time it would take for the secondary biological treatment processes to recolonize and be restored. Effluent quality quickly improved post bypass (Figure 2, Appendix 6).
    - From a federal WSER perspective, average TSS and CBOD concentrations both trended below 25 mg/L by approximately April 18, only four days after the bypass. This improvement brings the facility back in compliance with WSER.
    - From a provincial MPWWTP registration limit perspective, both TSS and CBOD limits are 10 mg/L average and 25 mg/L maximum. As of the beginning of June, intermittent exceedances of the 25 mg/L maximum limit have occurred. Average TSS concentrations are approaching the 10 mg/L limit, while average CBOD routinely exceeds the limit.
    - From a provincial MWR perspective, TSS and CBOD concentrations have returned to well below the 45 mg/L maximum limit stipulated in the regulation.
- Toxicity
  - Toxicity tests were conducted on March 20 (prior to bypass) and April 28 (post bypass). As expected, these results indicate that the effluent discharged was not toxic to rainbow trout (Appendix 7).
  - No toxicity testing was conducted during the bypass, as it was not a requirement of either the provincial or federal bypass authorizations.

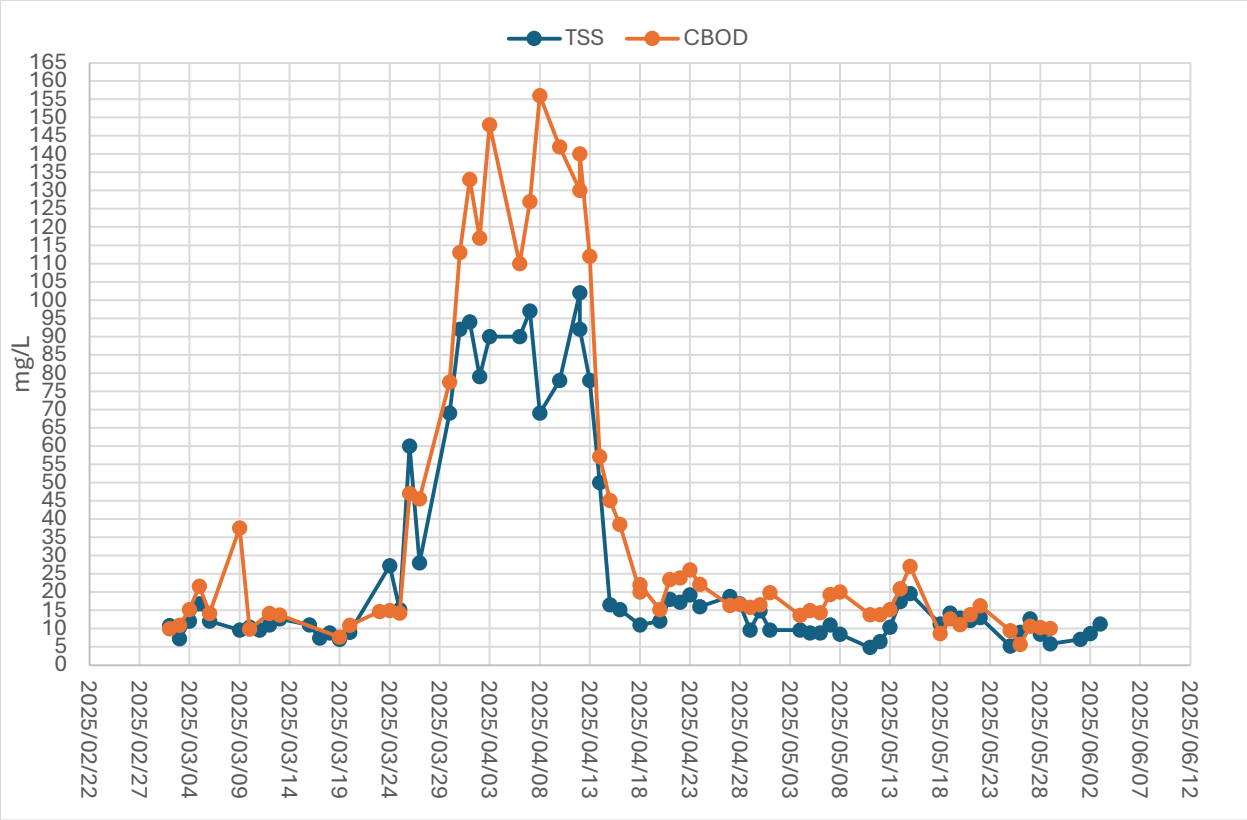


Figure 2 Effluent TSS and CBOD concentrations (mg/L) pre-, during and post-bypass

Surface Water

Appendix 8 presents results of the surface water sampling. From a recreational contact perspective, there was one *enterococci* result in the near-field surface water sampling events that exceeded the single sample maximum of 70 CFU/100 mL, with a result of 1,000 CFU/100 mL on April 15, one day after the bypass. All *enterococci* geomeans were below the 35 CFU/100 mL limit, and fecal coliforms were all below the historical BC Water Quality Guidelines (WQG) for protection of marine aquatic life. From a shellfish harvesting perspective, there were no exceedances of the 14 CFU/100 mL fecal coliform geometric mean limit and only 3 of 70 surface measurements exceeded 43 CFU/100 mL, representing only 4% of the samples. Effluent from the bypass was clearly trapped at depth, as expected based on diffuser design and outfall location.

Initial Dilution Zone

Appendix 9 presents raw analytical results from the IDZ sampling, while Appendix 10 contains results for those analytes that have water quality guidelines.

Twenty two percent of enterococci measurements exceeded the single sample maximum concentration of 70 CFU/100 mL in the IDZ during and post bypass. Most exceedances were at the middle and bottom depths (i.e., 40 to 60 m). There were two exceedances of geometric means of 35 CFU/100 mL (BC WQG) also at the mid and bottom depths at the IDZ. These exceedances happened on sampling days both during and after the bypass.

These bacteriological guideline exceedances are predicted to occur even during normal MPWWTP operation as disinfection processes were not included in plant design (HRP, 2019). Similar IDZ bacteriological exceedances are regularly observed during the routine IDZ sampling undertaken for the facility (CRD, 2024a).

As noted above, the highest concentration of fecal coliforms found in the IDZ was 1,100 CFU/100 mL (Appendices 9 and 10). This represents a receiving environment dilution factor of 4,227:1 based on the average effluent fecal coliform concentration observed during the bypass of 4,650,000 CFU/100 mL. This observed dilution factor is well above the predicted minimum initial dilution factor of 113:1 (Lorax, 2019).

Boron exceeded BC WQG at all IDZ stations on all days (Appendix 10); however, it has been previously observed that boron water quality guidelines are lower than the ambient boron concentrations in marine waters around Vancouver Island, making exceedances inevitable.

There were two exceedances of chronic BC WQG for zinc (average over five samples) in the IDZ at the bottom and middle depths in the IDZ. This is a common occurrence observed during the routine monitoring program. Zinc is often detected above guidelines in the marine receiving environment at both the IDZ and the reference sites.

Appendix 11 presents CTD casts in the IDZ for informational purposes.

Far Field

Appendix 12 presents bacteria and source tracking results from the four rounds of far field sampling.

Prior to the bypass, far field sampling results at Esquimalt Harbour and Ogden Point breakwater had exceedances of CSSP (2022) shellfish harvesting criterion (i.e. fecal coliform geomeans exceeding 14 CFU/100 mL). During the bypass, Esquimalt Harbour, Ogden Point, Haystock Islets, Foot of Cook Street and Trial Island had geomean exceedances. Post bypass, only Esquimalt Harbour, Ogden point breakwater and the foot of Cook Street had exceedances. There was a small amount of rainfall on the March 17 and March 31 far field sampling days. It should be noted that these three locations are all potentially influenced by shoreline stormwater discharges. Information about these confounding contaminant sources can be found in CRD Stormwater Quality Program annual reports (CRD, 2024b). No shellfish harvesting guideline exceedances were observed at Tl'ches (Chatham/Discovery Islands) during any of the four sampling events.

Though the observed exceedances confirmed the predicted moderate potential risk to shellfish harvesters, these areas are all currently closed to shellfish harvesting by the Department of Fisheries and Oceans, either through sanitary closure area 19.1 (https://www.pac.dfo-mpo.gc.ca/fm-gp/shellfish-mollusques/contamination/a-s-19-eng.html#SANICLOSE_19.1_742859747) or through a broader biotoxin closure (https://www.dfo-mpo.gc.ca/shellfish-mollusques/cssp-map-eng.htm).

There were no exceedances of Health Canada (2024) guidelines for primary contact recreation at any of the far-field locations during any of the four sampling events, confirming risk to recreation was low.

Overall, these observations were consistent with the low to negligible risk predictions from the oceanographic plume dispersion model used during the MPWWTP EIS (Lorax, 2019) and the routine outfall monitoring program.

Over the course of the bypass, bacterial source tracking analyses indicated that the number of gene copies of human-sourced bacteria increased at all stations, to a high of 13,000 gene copies/mL at the station located off the Ogden Point breakwater. By the final bypass far-field sampling day, gene copies/mL had decreased at all stations, though were still higher than pre-bypass levels at the foot of Cook Street and at Trial Island. These results confirm the presence of human derived wastewater at these locations, albeit at low levels, as predicted by the oceanographic plume dilution and dispersion model (Lorax, 2019). To provide context for interpretation of these results, 100 gene copies/mL is roughly equivalent to 1 CFU/100 mL, therefore the highest concentration of human-sourced bacteria would be equivalent to approximately 130 CFU/100 mL. As noted above, there were no exceedances to Health Canada (2024) guidelines regarding fecal coliform bacteria.

Finally, the CRD and Songhees First Nation were originally interested in deploying a remote bacteria sensor at Tl'ches (Chatham/Discovery Islands), but this deployment was not feasible due to equipment limitations and difficulty finding a suitable site in time. Discussion with Songhees First Nation is ongoing for future deployment opportunities.

Conclusions and Next Steps

Both the volume and the quality of bypass flows discharged were within what was authorized by the federal and provincial regulators. Effluent quality improved significantly post bypass once secondary and tertiary treatment were brought back online on April 14.

Effluent from the bypass was trapped well below the surface of the marine receiving environment as bacteria was not detected in excess on the ocean surface. There were no primary contact recreation guideline exceedances at any of the surface stations.

The bacterial count at the IDZ was an order of magnitude less than the oceanographic model predicted, though there were guideline exceedances observed at the edge of the IDZ. These exceedances, however, were expected and of similar magnitude to those observed during the routine outfall monitoring program.

Some effluent surfacing and exceedances to shellfish WQG were observed, but all were within the existing DFO sanitary shellfish harvesting closure area 19.1. Harvesting exceedances were not observed at Tl'ches (Chatham/Discovery Islands) during the bypass.

There were some exceedances of metal water quality guidelines for the protection of aquatic life (boron and zinc). However, these exceedances were unrelated to the bypass and of similar magnitude to concentrations observed during the routine outfall monitoring program.

The currently available modelling scenarios that were assessed during the MPWWTP EIS (HRP, 2019; Lorax, 2019) did not include a bypass event exactly like this one (i.e., 100% of primary treated flows discharged through the McLoughlin Point outfall). However, there were other available scenarios that were used to infer potential human health and environmental risks of this bypass event. Regardless, the CRD has committed to rerun the oceanographic model with parameters matching this bypass; timing of this modelling work is still to be determined.

The CRD is working to update the McLoughlin operating plan to include all regular maintenance activities that require bypasses of authorized works with recommendations for how and when to undertake that work to minimize any associated bypass requests. This updated plan will be available by September 2025. In the interim, Appendix 13 contains a list of anticipated cleaning, maintenance and inspection activities that will require full or partial plant bypasses. The CRD continues to review all plant operational activities to ensure that the need for bypasses is minimized.

Additionally, the CRD is working towards satisfying the federal requirement for a plan that describes future planned modifications to the wastewater system and other measures that will be taken to reduce the need for future temporary bypass authorizations that have large volumes, long durations and are untreated. This plan must include a schedule for implementation, a declaration that this plan is available to the public, and information on how it is publicly accessible (e.g. a website link). Similarly to the updated provincial operating plan, this modification plan will be available by September 2025.

Overall, the bypass works proceeded as expected, with more maintenance, cleaning and inspection activities taking place than originally planned due to the window of opportunity provided. The bypass duration was slightly shorter than predicted, and monitoring confirmed risks to human health and receiving environment were low to moderate. These risks were quickly reduced once the plant was brought back online to full operation. Due to the hydraulic design of the facility, there will continue to be future

maintenance, cleaning and inspection activities that will require bypasses in the future. However, the CRD is committed to ensuring that bypass needs are as minimal as possible.

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Lorax (2019) Effluent Dispersion Modelling for the McLoughlin Wastewater Treatment Plant. Prepared for Capital Regional District by Donald Hodgins (Seaconsult Marine Research) and Scott Tinis (Lorax Environmental Services). Victoria, BC, Canada.

Appendix 1 Federal Authorization

https://goto.crd.bc.ca/teams/es/epro/wmep/_layouts/15/DocIdRedir.aspx?ID=ENVS-365107157-4838

Appendix 2 Provincial Authorization

https://goto.crd.bc.ca/teams/es/epro/wmep/_layouts/15/DocIdRedir.aspx?ID=ENVS-365107157-4837

Appendix 3 Correspondence with First Nations

Available upon request to addressed First Nations.

APPENDIX 4

Bypass - Primary Effluent Flows (m^3/day)

Date	Flow (m^3/day)
26/03/2025	127,430
27/03/2025	161,551
28/03/2025	138,501
29/03/2025	125,014
30/03/2025	119,269
31/03/2025	112,005
01/04/2025	104,998
02/04/2025	103,756
03/04/2025	97,822
04/04/2025	95,745
05/04/2025	94,526
06/04/2025	104,539
07/04/2025	100,755
08/04/2025	96,672
09/04/2025	94,097
10/04/2025	95,339
11/04/2025	93,402
12/04/2025	90,988
13/04/2025	91,225
14/04/2025	89,227
Average daily flows	**106,843**
Total Flows	**2,136,861**

APPENDIX 5 – Wastewater Chemistry - Analytical Results During Bypass (mg/L unless indicated)

	26-Mar	27-Mar	30-Mar	31-Mar	01-Apr	02-Apr	03-Apr	06-Apr	07-Apr	08-Apr	10-Apr	12-Apr	13-Apr	14-Apr	Mean
Alkalinity					240					242					**241**
Biochemical Oxygen Demand (BOD)	60.6	48.5	128	141	170	160	200	150	161	187	188		170	99.6	**143**
Carbonaceous Biochemical Oxygen Demand (CBOD)	47	45.5	77.5	113	133	117	148	110	127	156	142	Replicate 1 = 130 Replicate 2 = 140	112	57.1	**110**
Chemical Oxygen Demand (COD)	168	135	336	370	371	349	380	355	399	374	387		420	304	**334**
Enterococci (CFU/100 mL)					770,000					600,000					**685,000**
Fecal Coliforms (CFU/100 mL)					3,400,000					5,900,000					**4,650,000**
NH3 (As N)		26	40.2		39.7		45.1	35.3		42.3					**38**
NH3 (As N)- Unionized		0.384	0.286		0.355		0.443	0.338		1.26					**0.51**
PO4 - Ortho (As P)										3.58					**3.58**
pH @ 15° C (pH units)		7.7	7.4		7.5		7.6	7.6		8.1	7.7		7.6		**7.7**
Biochemical Oxygen Demand-Soluble (SBOD)	18	24.2	41.2	64.5	85.3	65.6	95.7	66	78.6	103	93.2		64	45.9	**65**
Chemical Oxygen Demand-Soluble (SCOD)	80	80	184	208	220	210	239	216	224	222	237		275	234	**202**
Total Suspended Solids (TSS)	60	28	69	92	94	79	90	90	97	69	78	Replicate 1 = 102 Replicate 2 = 92	78	50	**78**

APPENDIX 6 – Wastewater Chemistry - Analytical Results Post Bypass (mg/L unless indicated)

	15-Apr	16-Apr	18-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	27-Apr	28-Apr	29-Apr	30-Apr	Mean
Alkalinity	285					239					233		**252**
Biochemical Oxygen Demand (BOD)	76.3	70.3		21.7	32.6	31.1	34.3	30.3	25.1	23.3	22	26.4	**36**
Carbonaceous Biochemical Oxygen Demand (CBOD)	45.1	38.5	Replicate 1 = 20 Replicate 2 = 22	15.2	23.4	23.9	26.1	22.1	16.3	16.6	15.8	16.5	**23**
Chemical Oxygen Demand (COD)	228	175		114	166	135	121	105	106	117	112	116	**136**
Enterococci (CFU/100 mL)	850,000				550,000						64,000		**488,000**
Fecal Coliforms (CFU/100 mL)	4,600,000				3,000,000						650,000		**2,750,000**
NH3 (As N)	52.3	40.4		36.5		44.7		41.9	46.4		43.7		**44**
NH3 (As N)- Unionized	1.3	0.767		0.527		0.948		0.87	0.598		0.661		**0.8**
PO4 - Ortho (As P)						3.12							**3**
pH @ 15° C (pH units)	8	7.9		7.7		7.9		7.9	7.7		7.8		**8**
Biochemical Oxygen Demand - Soluble (SBOD)	36.4	29.5		8.5	14.8	13.4	15.2	14.5	9.91	11.7	12.4	8.14	**16**
Chemical Oxygen Demand-Soluble (SCOD)	182	132		95	119	101	102	93	81	100	107	93	**110**
Total Suspended Solids (TSS)	16.5	15.2	11	12	18	17.2	19.2	16	18.8	16.8	9.6	14.8	**15**

Appendix 7 – Toxicity Test Results

https://goto.crd.bc.ca/teams/es/epro/wmep/_layouts/15/DocIdRedir.aspx?ID=ENVS-2012174965-4193

https://goto.crd.bc.ca/teams/es/epro/wmep/_layouts/15/DocIdRedir.aspx?ID=ENVS-2012174965-4178

APPENDIX 8 – Surface Sampling Results

	Fecal Coliform CFU/100 mL*						Enterococci CFU/100 mL^					
	During Bypass		Post Bypass				During Bypass		Post Bypass			
	03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Geomean	03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Geomean
McL-01	<1	18	3,300	<1	<1	9.0	<1	7	1,000	<1	<1	5.9
McL-14	<1	21	7	10	<1	4.3	<1	19	3	4	<1	3.0
McL-16	<1	14	29	<1	<1	3.3	<1	14	5	<1	<1	2.3
McL-18	2	1	11	<1	<1	1.9	1	3	1	<1	<1	1.2
McL-20	<1	30	460	<1	<1	6.7	<1	22	71	<1	<1	4.4
McL-22	1	19	9	<1	<1	2.8	<1	10	2.5	<1	<1	1.9
McL-24	3	15	<1	<1	<1	2.1	1	14	2	<1	<1	1.9
McL-26	1	18	<1	<1	<1	1.8	<1	4	<1	<1	<1	1.3
McL-28	4	<1	1	<1	1	1.3	1	<1	<1	<1	<1	1.0
McL-30	3	<1	<1	<1	<1	1.2	3	<1	<1	<1	<1	1.2
McL-32	<1	26	18	<1	1	3.4	<1	24	1	<1	<1	1.9
McL-34	<1	14	9	<1	<1	2.6	<1	15	<1	<1	<1	1.7
McL-36	71	33	1	<1	<1	4.7	67	28	1	<1	<1	4.5
McL-D1	1	25	17	4	<1	4.4	<1	18	4	<1	<1	2.4
Ref-PB	1	6	9	2	<1	2.6	<1	8	2	<1	<1	1.7
Ref-CB	2	2	1	<1	<1	1.3	3	1	<1	<1	<1	1.2

**Shaded cells indicate exceedance to historical BC WQG Geomean of 200 CFU/100 mL for primary contact recreation or CSSP shellfish harvesting geomean limit of 14 CFU/100 mL.*

^Shaded cells indicate exceedance to Environment Canada maximum guidelines of 70 CFU/100 mL or to geomean of 35 CFU/100 mL.

APPENDIX 9 – IDZ Analytical Results – Full Dataset

Table A9-1: Results for April 3, 2025

03-Apr-25	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Conductivity	Copper	Enterococci	Fecal Coliforms	Hardness (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µS/cm	µg/L	CFU/100mL	CFU/100mL	mg/L
Constance Bank Reference Station - Top	26.4	<0.5	1.37	7.3	<0.5	<0.5	3800	0.032	333	1.15	<0.05	48000	<0.5	5	2	5230
Constance Bank Reference Station - Middle	22.2	<0.5	1.59	8.4	<0.5	<0.5	3980	0.075	345	<0.5	<0.05	49000	<0.5	<1	1	5340
Constance Bank Reference Station - Bottom	28.9	<0.5	2.05	7.7	<0.5	<0.5	4080	0.06	361	1.07	<0.05	48000	<0.5	2	<1	5590
McLoughlin Point - Receiving Water - IDZ Station 1 Top	23	<0.5	1.86	7.3	<0.5	<0.5	4060	0.053	355	<0.5	<0.05	48000	<0.5	3	5	5590
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	28.3	<0.5	1.83	7	<0.5	<0.5	4140	0.033	360	<0.5	<0.05	48000	<0.5	73	73	5540
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	25.4	<0.5	1.54	7.6	<0.5	<0.5	4200	0.042	361	<0.5	<0.05	48000	<0.5	980	840	5640
McLoughlin Point - Receiving Water - IDZ Station 2 Top	19.2	<0.5	1.7	7.6	<0.5	<0.5	4250	0.075	368	1.08	<0.05	48000	<0.5	1	3	5900
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	31.2	<0.5	1.76	7	<0.5	<0.5	4180	0.054	354	<0.5	<0.05	48000	<0.5	2100	1000	5550
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	25.6	<0.5	1.9	7.5	<0.5	<0.5	4280	0.1	368	<0.5	<0.05	48000	<0.5	1100	1100	5660
McLoughlin Point - Receiving Water - IDZ Station 3 Top	19.4	<0.5	1.63	7.8	<0.5	<0.5	4200	0.041	354	<0.5	<0.05	48000	<0.5	<1	<1	5450
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	20.6	<0.5	1.7	7.3	<0.5	<0.5	4170	0.048	345	<0.5	<0.05	48000	<0.5	570	380	5360
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	23.4	<0.5	1.78	9.1	<0.5	<0.5	4200	0.036	348	<0.5	<0.05	48000	<0.5	74	83	5440
McLoughlin Point - Receiving Water - IDZ Station 4 Top	22.3	<0.5	1.84	8.1	<0.5	<0.5	4340	0.069	366	<0.5	<0.05	48000	<0.5	2	3	5600
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	20.7	<0.5	1.8	7.3	<0.5	<0.5	4200	0.068	351	<0.5	<0.05	48000	<0.5	8	11	5480
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	16.9	<0.5	1.87	8.9	<0.5	<0.5	4470	0.026	371	<0.5	<0.05	48000	<0.5	6	12	5710
Parry Bay Reference Station - Top	27	<0.5	1.57	8.2	<0.5	<0.5	4010	0.073	363	<0.5	<0.05	48000	<0.5	6	6	5550
Parry Bay Reference Station - Middle	37.8	<0.5	2.04	9.1	<0.5	<0.5	4130	0.053	365	0.54	<0.05	49000	<0.5	2	3	5670
Parry Bay Reference Station - Bottom	23.4	<0.5	1.91	7.4	<0.5	<0.5	4120	0.093	357	<0.5	<0.05	49000	<0.5	3	5	5620

Table A9-1: Results for April 3, 2025 (continued)

03-Apr-25	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	N - Nh3 (As N)	N - No2 (As N)	N - No3 (As N)	N - No3 + No2 (As N)	Nickel	pH	Phosphorus	Potassium	Salinity	Selenium
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L		mg/L	mg/L	g/L	µg/L
Constance Bank Reference Station - Top	11	<0.05	152	1070	1.1	<0.0019	8.48	0.058	0.0077	0.348	0.355	<0.2	7.72	61	325	31.2	<0.5
Constance Bank Reference Station - Middle	11	<0.05	154	1090	1.11	<0.0019	9.04	0.064	0.0066	0.335	0.341	<0.2	7.77	66	328	31.8	<0.5
Constance Bank Reference Station - Bottom	<10	<0.05	159	1140	1.05	<0.0019	9.29	0.053	0.0075	0.34	0.347	<0.2	7.79	92	348	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Top	<10	<0.05	159	1140	1.2	<0.0019	9.09	0.055	0.0074	0.334	0.341	<0.2	7.8	72	346	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	15	<0.05	162	1130	1.25	<0.0019	8.59	0.053	0.0074	0.342	0.35	<0.2	7.63	81	340	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	13	<0.05	164	1150	1.2	<0.0019	9.45	0.098	0.008	0.343	0.351	<0.2	7.68	56	349	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Top	<10	<0.05	167	1210	1.27	<0.0019	9.98	0.048	0.0074	0.338	0.346	<0.2	7.68	78	360	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	16	<0.05	162	1130	1.44	<0.0019	9.37	0.14	0.0071	0.336	0.343	<0.2	7.69	66	341	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	14	<0.05	153	1150	1.28	<0.0019	9.68	0.14	0.0073	0.348	0.355	<0.2	7.69	88	350	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Top	<10	<0.05	149	1110	1.21	<0.0019	8.97	0.043	0.0071	0.35	0.357	<0.2	7.7	68	340	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	<10	<0.05	148	1090	1.24	<0.0019	9.17	0.091	0.007	0.35	0.357	<0.2	7.7	69	339	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	<10	<0.05	150	1110	1.12	<0.0019	9.37	0.079	0.0087	0.347	0.356	<0.2	7.7	64	343	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Top	13	<0.05	157	1140	1.58	<0.0019	9.14	0.044	0.0073	0.343	0.35	<0.2	7.71	52	350	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	<10	<0.05	153	1120	1.17	0.0025	9.26	0.041	0.007	0.348	0.355	<0.2	7.7	77	337	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	<10	<0.05	162	1160	1.33	0.0023	9.82	0.055	0.0071	0.344	0.351	<0.2	7.71	60	354	31.3	<0.5
Parry Bay Reference Station - Top	11	<0.05	156	1130	1.25	0.0021	8.84	0.059	0.0072	0.341	0.349	<0.2	7.78	81	340	31.5	<0.5
Parry Bay Reference Station - Middle	27	<0.05	160	1160	1.49	0.0024	8.8	0.058	0.007	0.333	0.34	<0.2	7.8	66	353	31.6	<0.5
Parry Bay Reference Station - Bottom	<10	<0.05	157	1150	1.45	0.0032	9.66	0.051	0.0067	0.345	0.352	<0.2	7.77	76	346	31.8	<0.5

Table A9-1: Results for April 3, 2025 (continued)

03-Apr-25	Silicon	Silver	Strontium	Sulfur	Thallium	Tin	Titanium	TSS	Uranium	Vanadium	Zinc
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
Constance Bank Reference Station - Top	1300	<0.05	6530	788	<0.05	<1	<5	2.8	2.58	2.11	<3
Constance Bank Reference Station - Middle	1250	<0.05	6660	777	<0.05	<1	<5	1.2	2.8	3.17	<3
Constance Bank Reference Station - Bottom	1330	<0.05	7250	813	<0.05	<1	<5	1.6	2.79	2.9	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Top	1360	0.056	6980	827	<0.05	<1	<5	<1	2.71	4.26	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	1400	<0.05	7010	810	<0.05	<1	<5	<1	2.85	3.39	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	1370	0.051	7280	838	<0.05	<1	<5	<1	2.8	4.2	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Top	1400	<0.05	7460	849	<0.05	<1	<5	<1	2.79	3.96	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	1390	<0.05	7200	841	<0.05	<1	<5	2.8	2.67	3.85	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	1420	<0.05	7180	845	<0.05	<1	<5	7.2	2.78	5.28	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Top	1370	<0.05	7060	836	<0.05	<1	<5	6.8	2.73	4.74	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	1310	<0.05	6870	803	<0.05	<1	<5	3.2	2.57	4.91	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	1310	<0.05	7140	846	<0.05	<1	<5	2.8	2.65	4.81	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Top	1460	<0.05	7200	860	<0.05	<1	<5	4.8	2.78	4.66	6.6
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	1350	0.076	6960	831	<0.05	<1	<5	2.8	2.72	4.82	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	1430	<0.05	7300	873	<0.05	<1	<5	4.8	2.84	5.41	<3
Parry Bay Reference Station - Top	1360	<0.05	6950	812	<0.05	<1	<5	<1	2.7	3.07	<3
Parry Bay Reference Station - Middle	1320	<0.05	7320	858	<0.05	<1	<5	<1	2.8	3.54	<3
Parry Bay Reference Station - Bottom	1290	<0.05	7180	839	<0.05	<1	<5	<1	2.81	4.06	<3

Table A9-2: Results for April 9, 2025

09-Apr-25	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Conductivity	Copper	Enterococci	Fecal Coliforms	Hardness (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µS/cm	µg/L	CFU/100mL	CFU/100 mL	mg/L
Constance Bank Reference Station - Top	31.7	<0.5	1.66	7.2	<0.5	<0.5	3770	0.088	333	<0.5	<0.5	48000	<0.5	<1	4	5240
Constance Bank Reference Station - Middle	43.9	<0.5	1.33	7	<0.5	<0.5	3800	0.072	331	<0.5	<0.5	48000	<0.5	2	6	5200
Constance Bank Reference Station - Bottom	25.5	<0.5	1.94	7.6	<0.5	<0.5	3940	0.041	348	<0.5	<0.5	48000	<0.5	1	9	5410
McLoughlin Point - Receiving Water - IDZ Station 1 Top	13.4	<0.5	1.78	7.3	<0.5	<0.5	3830	0.035	337	<0.5	<0.5	48000	<0.5	19	30	5090
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	13.9	<0.5	1.89	8.1	<0.5	<0.5	3770	0.066	332	<0.5	<0.5	48000	<0.5	29	39	5120
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	31.5	<0.5	1.82	7.6	<0.5	<0.5	3880	0.229	348	<0.5	0.116	48000	<0.5	95	110	5260
McLoughlin Point - Receiving Water - IDZ Station 2 Top	21.3	<0.5	1.67	6.9	<0.5	<0.5	3560	0.169	316	<0.5	<0.5	48000	<0.5	19	34	4740
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	27.4	<0.5	2.07	7.6	<0.5	<0.5	3610	0.217	324	<0.5	0.117	48000	<0.5	33	42	5020
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	20.2	<0.5	1.49	6.3	<0.5	<0.5	3490	0.045	307	<0.5	<0.5	48000	<0.5	71	95	4790
McLoughlin Point - Receiving Water - IDZ Station 3 Top	15.1	<0.5	1.81	7.6	<0.5	<0.5	3860	0.078	336	<0.5	<0.5	48000	<0.5	15	28	5130
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	13.5	<0.5	1.78	7.1	<0.5	<0.5	3560	0.087	316	<0.5	<0.5	48000	<0.5	44	18	4820
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	16.5	<0.5	1.72	5.5	<0.5	<0.5	3770	0.037	330	<0.5	<0.5	48000	<0.5	40	49	5030
McLoughlin Point - Receiving Water - IDZ Station 4 Top	24.6	<0.5	1.81	7.1	<0.5	<0.5	3920	0.026	347	<0.5	<0.5	48000	<0.5	18	26	5310
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	14.7	<0.5	1.57	7.1	<0.5	<0.5	3650	0.045	312	<0.5	<0.5	48000	<0.5	68	74	4770
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	18.9	<0.5	2.09	7.1	<0.5	<0.5	3800	0.028	336	<0.5	<0.5	48000	<0.5	50	65	5160
Parry Bay Reference Station - Top	10.4	<0.5	1.85	7	<0.5	<0.5	3670	0.033	320	<0.5	<0.5	48000	<0.5	24	39	4970
Parry Bay Reference Station - Middle	21.5	<0.5	1.61	7.7	<0.5	<0.5	3850	0.066	341	<0.5	<0.5	48000	<0.5	9	20	5180
Parry Bay Reference Station - Bottom	26.8	<0.5	1.66	6.6	<0.5	<0.5	3800	0.018	327	<0.5	<0.5	48000	<0.5	14	24	4960

Table A9-2: Results for April 9, 2025 (continued)

09-Apr-25	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	N - Nh3 (As N)	N - No2 (As N)	N - No3 (As N)	N - No3 + No2 (As N)	Nickel	pH	Phosphorus	Potassium	Salinity	Selenium
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L		mg/L	mg/L	g/L	µg/L
Constance Bank Reference Station - Top	21	<0.05	143	1070	1.52	<0.0019	8.66	0.058	0.0071	0.356	0.363	<0.2	7.74	88	327	31.1	<0.5
Constance Bank Reference Station - Middle	37	<0.05	143	1060	1.3	<0.0019	8.05	0.05	0.0071	0.356	0.363	<0.2	7.73	78	324	31.1	<0.5
Constance Bank Reference Station - Bottom	18	<0.05	150	1100	1.58	<0.0019	8.86	0.055	0.007	0.346	0.353	<0.2	7.73	74	344	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Top	<10	<0.05	141	1030	1.08	<0.0019	9.05	0.07	0.007	0.344	0.351	<0.2	7.75	74	319	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	<10	<0.05	138	1040	1.06	<0.0019	8.77	0.061	0.0074	0.343	0.351	0.81	7.75	71	316	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	42	<0.05	142	1070	2.06	0.0026	9.08	0.067	0.007	0.352	0.359	1.63	7.74	78	328	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Top	<10	<0.05	132	960	1.05	0.003	8.15	0.07	0.0072	0.346	0.353	0.67	7.76	72	296	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	22	<0.05	135	1020	1.69	<0.0019	8.33	0.058	0.0075	0.349	0.356	1.62	7.76	82	314	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	<10	<0.05	128	976	0.94	<0.0019	7.88	0.068	0.0072	0.35	0.357	<0.2	7.63	<50	299	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Top	<10	<0.05	144	1040	0.82	<0.0019	8.69	0.065	0.0072	0.342	0.349	<0.2	7.74	59	322	31.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	<10	<0.05	132	978	0.89	<0.0019	8.24	0.058	0.0073	0.348	0.355	<0.2	7.79	55	298	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	<10	<0.05	139	1020	0.67	<0.0019	7.81	0.059	0.0074	0.346	0.353	<0.2	7.82	<50	315	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Top	13	<0.05	145	1080	1.04	<0.0019	8.72	0.068	0.0073	0.346	0.354	<0.2	7.84	86	333	31.3	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	<10	<0.05	134	969	0.87	<0.0019	7.59	0.07	0.0077	0.349	0.356	0.33	7.85	58	300	31.4	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	<10	<0.05	142	1050	1.02	<0.0019	9.04	0.058	0.0073	0.352	0.359	0.22	7.84	72	325	31.5	<0.5
Parry Bay Reference Station - Top	<10	<0.05	136	1010	1.02	0.003	7.88	0.063	0.0075	0.345	0.352	<0.2	7.74	<50	313	31.1	<0.5
Parry Bay Reference Station - Middle	<10	<0.05	141	1050	0.99	<0.0019	9.21	0.056	0.0075	0.35	0.357	1.26	7.74	73	322	31.1	<0.5
Parry Bay Reference Station - Bottom	<10	<0.05	138	1010	0.95	<0.0019	8.96	0.063	0.0073	0.353	0.36	<0.2	7.75	68	308	31.2	<0.5

Table A9-2: Results for April 9, 2025 (continued)

09-Apr-25	Silicon	Silver	Strontium	Sulfur	Thallium	Tin	Titanium	TSS	Uranium	Vanadium	Zinc
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
Constance Bank Reference Station - Top	1330	0.053	6420	821	<0.05	<1	<5	<1	2.63	2.99	<3
Constance Bank Reference Station - Middle	1320	<0.05	6600	755	<0.05	<1	<5	<1	2.53	2.97	6.6
Constance Bank Reference Station - Bottom	1380	<0.05	7030	779	<0.05	<1	<5	1.2	2.75	2.8	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Top	1250	<0.05	6660	796	<0.05	<1	<5	1.2	2.46	3.13	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	1300	<0.05	6640	761	<0.05	<1	<5	1.6	2.61	3.19	44.3
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	1300	<0.05	6860	794	<0.05	<1	<5	1.6	2.69	3.38	83.7
McLoughlin Point - Receiving Water - IDZ Station 2 Top	1200	<0.05	5920	749	<0.05	<1	<5	<1	2.36	3.15	39.2
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	1220	<0.05	6320	758	<0.05	<1	<5	<1	2.67	3.44	81.9
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	1180	<0.05	5800	732	<0.05	<1	<5	<1	2.37	2.65	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Top	1300	<0.05	6610	761	<0.05	<1	<5	1.2	2.51	3.14	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	1190	<0.05	6040	711	<0.05	<1	<5	<1	2.34	2.29	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	1250	<0.05	6640	736	<0.05	<1	<5	<1	2.47	3.34	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Top	1340	<0.05	6960	798	<0.05	<1	<5	1.6	2.67	2.78	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	1160	<0.05	6240	672	<0.05	<1	<5	1.2	2.5	2.93	15.2
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	1260	<0.05	6710	764	<0.05	<1	<5	<1	2.46	3.08	<3
Parry Bay Reference Station - Top	1220	<0.05	6370	787	<0.05	<1	<5	<1	2.39	3.41	<3
Parry Bay Reference Station - Middle	1310	<0.05	6760	782	<0.05	<1	<5	<1	2.67	2.54	52.7
Parry Bay Reference Station - Bottom	1260	<0.05	6450	746	<0.05	<1	<5	2.4	2.39	2.66	<3

Table A9-3: Results for April 15, 2025

15-Apr-25	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Conductivity	Copper	Enterococci	Fecal Coliforms	Hardness (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µS/cm	µg/L	CFU/100mL	CFU/100mL	mg/L
Constance Bank Reference Station - Top	18.2	<0.5	1.5	6.9	<0.5	<0.5	3710	0.044	340	<0.5	0.054	48000	0.9	<1	1	5260
Constance Bank Reference Station - Middle	34.5	<0.5	1.6	8.2	<0.5	<0.5	3720	0.065	348	<0.5	0.071	48000	<0.5	<1	1	5210
Constance Bank Reference Station - Bottom	36.4	<0.5	2.03	8.5	<0.5	<0.5	3860	0.032	362	0.68	0.056	48000	<0.5	<1	2	5490
McLoughlin Point - Receiving Water - IDZ Station 1 Top	20.1	<0.5	1.7	7.8	<0.5	<0.5	3890	0.065	354	<0.5	<0.05	48000	<0.5	930	1100	5420
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	12.6	<0.5	1.24	7.4	<0.5	<0.5	3670	0.035	338	<0.5	<0.05	48000	<0.5	66	110	5250
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	17.7	<0.5	2.11	7.5	<0.5	<0.5	3820	0.082	353	<0.5	<0.05	48000	<0.5	130	580	5450
McLoughlin Point - Receiving Water - IDZ Station 2 Top	11.5	<0.5	2.09	7.9	<0.5	<0.5	3900	0.054	361	<0.5	<0.05	48000	<0.5	6	31	5630
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	19	<0.5	2.02	7.8	<0.5	<0.5	3860	0.029	363	0.79	<0.05	48000	<0.5	73	120	5510
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	18.3	<0.5	1.74	7.9	<0.5	<0.5	3820	0.058	355	<0.5	<0.05	48000	<0.5	600	860	5460
McLoughlin Point - Receiving Water - IDZ Station 3 Top	11.6	<0.5	1.96	7.2	<0.5	<0.5	3960	0.035	363	<0.5	<0.05	48000	<0.5	78	550	5660
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	9.5	<0.5	1.46	6.9	<0.5	<0.5	3680	0.085	334	<0.5	<0.05	48000	<0.5	710	910	5220
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	17	<0.5	1.91	7.4	<0.5	<0.5	3830	0.039	349	<0.5	<0.05	48000	<0.5	660	940	5480
McLoughlin Point - Receiving Water - IDZ Station 4 Top	9.1	<0.5	2.12	8.3	<0.5	<0.5	3810	0.059	349	<0.5	0.064	48000	<0.5	56	140	5520
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	10.8	<0.5	2.05	7.5	<0.5	<0.5	3900	0.085	365	0.55	<0.05	48000	<0.5	60	160	5610
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	13.3	<0.5	1.78	7.6	<0.5	<0.5	3760	0.056	355	0.62	<0.05	48000	<0.5	7	37	5470
Parry Bay Reference Station - Top	21.6	<0.5	1.73	7.6	<0.5	<0.5	3790	0.043	341	0.75	<0.05	48000	<0.5	6	27	5370
Parry Bay Reference Station - Middle	11.7	<0.5	1.9	7.7	<0.5	<0.5	3930	0.043	349	<0.5	<0.05	48000	<0.5	22	38	5440
Parry Bay Reference Station - Bottom	20.2	<0.5	1.89	7.9	<0.5	<0.5	4020	0.071	368	<0.5	<0.05	48000	<0.5	24	39	5650

Table A9-3: Results for April 15, 2025 (continued)

15-Apr-25	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	N - Nh3 (As N)	N - No2 (As N)	N - No3 (As N)	N - No3 + No2 (As N)	N - Tkn (As N)	N - Total (As N)	Nickel	Oil & Grease, Mineral	Oil & grease, total	Organic Carbon
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L
Constance Bank Reference Station - Top	18	0.961	142	1070	0.82	<0.0019	8.84	0.059	0.006	0.333	0.339	<0.1	0.42	<0.2	<2	<1	1.2
Constance Bank Reference Station - Middle	52	0.264	136	1050	1.8	<0.0019	8.56	0.048	0.0059	0.314	0.32	<0.1	0.28	0.67	<2	<1	1.2
Constance Bank Reference Station - Bottom	43	5.74	141	1110	1.76	<0.0019	8.87	0.06	0.0058	0.326	0.332	0.45	0.78	0.44	<2	<1	1.2
McLoughlin Point - Receiving Water - IDZ Station 1 Top	29	<0.05	145	1100	1.07	<0.0019	9.06	0.17	0.0061	0.325	0.331	0.59	0.92	<0.2	<2	<1	1.4
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	12	<0.05	136	1070	0.9	<0.0019	8.84	0.066	0.006	0.321	0.327	0.38	0.7	0.26	<2	<1	1.3
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	21	<0.05	139	1110	0.88	<0.0019	8.94	0.14	0.0061	0.318	0.324	0.59	0.92	<0.2	<2	<1	1.3
McLoughlin Point - Receiving Water - IDZ Station 2 Top	12	<0.05	140	1150	0.65	0.003	9.61	0.069	0.0068	0.347	0.354	0.41	0.76	<0.2	<2	<1	1.2
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	22	<0.05	140	1120	0.72	<0.0019	9.39	0.083	0.0062	0.32	0.326	0.54	0.86	0.89	<2	<1	1.4
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	25	<0.05	138	1110	0.76	<0.0019	9.12	0.098	0.0061	0.316	0.322	<0.1	0.36	<0.2	<2	<1	1.3
McLoughlin Point - Receiving Water - IDZ Station 3 Top	12	<0.05	145	1150	0.8	<0.0019	9.48	0.079	0.0062	0.317	0.323	0.47	0.8	<0.2	<2	<1	1.3
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	13	<0.05	137	1070	0.88	<0.0019	8.6	0.099	0.0062	0.316	0.323	0.12	0.44	<0.2	<2	<1	1.2
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	24	<0.05	144	1120	0.89	<0.0019	8.69	0.12	0.0063	0.326	0.332	0.52	0.85	<0.2	<2	<1	1.1
McLoughlin Point - Receiving Water - IDZ Station 4 Top	10	<0.05	138	1130	0.91	<0.0019	8.83	0.079	0.0065	0.333	0.34	0.54	0.88	<0.2	<2	<1	1.1
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	18	<0.05	142	1140	0.93	<0.0019	9.89	0.068	0.0064	0.322	0.328	0.38	0.71	<0.2	<2	<1	1.1
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	18	<0.05	135	1110	1.03	<0.0019	8.81	0.055	0.0063	0.32	0.326	<0.1	0.38	<0.2	<2	<1	1.2
Parry Bay Reference Station - Top	30	0.122	142	1100	1.69	<0.0019	8.87	0.057	0.0062	0.327	0.333	0.53	0.86	0.66	<2	<1	1.2
Parry Bay Reference Station - Middle	<10	<0.05	147	1110	0.77	<0.0019	9.22	0.067	0.0063	0.323	0.33	0.48	0.8	<0.2	<2	<1	1.2
Parry Bay Reference Station - Bottom	14	<0.05	149	1150	0.99	<0.0019	9.58	0.06	0.0063	0.327	0.333	0.45	0.79	0.26	<2	1.1	1.2

Table A9-3: Results for April 15, 2025 (continued)

15-Apr-25	P - Po4 - Ortho (As P)	pH	Phosphorus	Potassium	Salinity	Selenium	Silicon	Silver	Strontium	Sulfide	Sulfur	Sulphate	Thallium	Tin	Titanium	TSS	Uranium	Vanadium	Zinc	Zirconium
	mg/L		mg/L	mg/L	g/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
Constance Bank Reference Station - Top	0.074	7.61	64.077	325	31.3	<0.5	1210	<0.05	6510	<0.0018	795	2500	<0.05	<1	<5	2.8	2.53	3.72	<3	<10
Constance Bank Reference Station - Middle	0.073	7.69	111.073	326	31.5	<0.5	1310	<0.05	6540	<0.0018	755	2500	<0.05	<1	<5	1.2	2.46	3.67	15.5	<10
Constance Bank Reference Station - Bottom	0.075	7.7	93.074	342	31.5	<0.5	1310	<0.05	6970	<0.0018	798	2500	<0.05	<1	<5	2	2.73	3.83	13.3	<10
McLoughlin Point - Receiving Water - IDZ Station 1 Top	0.082	7.72	109.078	330	31.5	<0.5	1290	<0.05	6930	<0.0018	786	2500	<0.05	<1	<5	1.6	2.59	4.73	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	0.071	7.73	90.066	328	31.5	<0.5	1200	<0.05	6660	<0.0018	770	2400	<0.05	<1	<5	3.2	2.53	4.54	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	0.072	7.72	106.067	339	31.4	<0.5	1290	<0.05	6920	<0.0018	810	2400	<0.05	<1	<5	<1	2.6	6.04	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 2 Top	0.072	7.73	111.067	352	31.4	<0.5	1320	<0.05	7220	<0.0018	858	2500	<0.05	<1	<5	<1	2.66	4.87	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	0.072	7.73	93.078	348	31.4	<0.5	1330	<0.05	7170	<0.0018	820	2500	<0.05	<1	<5	<1	2.58	4.98	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	0.076	7.72	91.073	336	31.5	<0.5	1350	<0.05	6950	<0.0018	816	2500	<0.05	<1	<5	<1	2.59	5.36	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 3 Top	0.07	7.73	100.068	351	31.4	<0.5	1290	<0.05	7380	<0.0018	818	2500	<0.05	<1	<5	2.4	2.72	5.14	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	0.078	7.73	100.066	321	31.5	<0.5	1220	<0.05	6710	<0.0018	740	2500	<0.05	<1	<5	<1	2.5	5.3	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	0.073	7.73	104.072	343	31.5	<0.5	1300	<0.05	6990	<0.0018	803	2500	<0.05	<1	<5	2	2.59	6.54	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 4 Top	0.073	7.73	118.076	349	31.4	<0.5	1240	<0.05	6920	<0.0018	823	2500	<0.05	<1	<5	4.4	2.66	5.13	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	0.072	7.73	87.064	352	31.4	<0.5	1320	<0.05	7350	<0.0018	838	2500	<0.05	<1	<5	2.8	2.69	4.86	<3	<10
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	0.068	7.74	89.062	344	31.4	<0.5	1290	<0.05	7010	<0.0018	814	2400	<0.05	<1	<5	2.8	2.55	5.43	<3	<10
Parry Bay Reference Station - Top	0.07	7.72	87.073	334	31.4	<0.5	1270	<0.05	6770	<0.0018	800	2500	<0.05	<1	<5	1.6	2.56	4.37	12.5	<10
Parry Bay Reference Station - Middle	0.072	7.72	89.073	335	31.5	<0.5	1280	<0.05	6820	<0.0018	777	2500	<0.05	<1	<5	1.2	2.59	4.97	<3	<10
Parry Bay Reference Station - Bottom	0.073	7.72	84.073	351	31.5	<0.5	1350	<0.05	7350	<0.0018	815	2500	<0.05	<1	<5	3.6	2.73	4.61	<3	<10

Table A9-4: Results for April 22, 2025

22-Apr-25	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Conductivity	Copper	Enterococci	Fecal Coliforms	Hardness (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µS/cm	µg/L	CFU/100mL	CFU/100mL	mg/L
Constance Bank Reference Station - Top	11.5	<0.5	1.64	7.6	<0.5	<0.5	3820	0.047	333	<0.5	<0.05	48000	<0.5	<1	2	5190
Constance Bank Reference Station - Middle	27.9	<0.5	1.73	7.1	<0.5	<0.5	4000	0.069	344	<0.5	<0.05	48000	<0.5	1	<1	5410
Constance Bank Reference Station - Bottom	15.5	<0.5	2.07	8	<0.5	<0.5	4580	0.051	405	<0.5	<0.05	48000	<0.5	<1	6	6390
McLoughlin Point - Receiving Water - IDZ Station 1 Top	<5	<0.5	1.66	8.3	<0.5	<0.5	4090	0.069	355	<0.5	<0.05	47000	<0.5	19	37	5580
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	<5	<0.5	1.88	7.5	<0.5	<0.5	4050	0.047	351	<0.5	<0.05	48000	<0.5	66	64	5310
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	9.2	<0.5	1.94	7.4	<0.5	<0.5	4150	0.087	363	<0.5	<0.05	48000	<0.5	<1	6	5610
McLoughlin Point - Receiving Water - IDZ Station 2 Top	<5	<0.5	1.79	7.5	<0.5	<0.5	4030	0.086	342	<0.5	<0.05	47000	<0.5	78	97	5380
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	7.6	<0.5	1.78	8.2	<0.5	<0.5	4030	0.027	348	<0.5	<0.05	47000	<0.5	120	150	5360
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	13.9	<0.5	2.18	8.2	<0.5	<0.5	4020	0.067	347	<0.5	<0.05	48000	<0.5	130	150	5380
McLoughlin Point - Receiving Water - IDZ Station 3 Top	6.1	<0.5	1.97	7.6	<0.5	<0.5	4020	0.066	354	<0.5	<0.05	47000	<0.5	24	27	5250
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	9	<0.5	1.84	6.7	<0.5	<0.5	3820	0.045	318	<0.5	<0.05	48000	<0.5	110	130	5000
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	5.9	<0.5	1.5	8.2	<0.5	<0.5	4090	0.117	353	<0.5	<0.05	48000	<0.5	91	98	5370
McLoughlin Point - Receiving Water - IDZ Station 4 Top	<5	<0.5	2.01	6.8	<0.5	<0.5	3920	0.098	330	<0.5	<0.05	47000	<0.5	<1	1	5080
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	<5	<0.5	1.88	7.3	<0.5	<0.5	3940	0.019	332	<0.5	<0.05	47000	<0.5	39	39	5120
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	5.4	<0.5	1.74	8.2	<0.5	<0.5	4220	0.051	359	<0.5	<0.05	48000	<0.5	26	37	5640
Parry Bay Reference Station - Top	5.6	<0.5	1.82	8.4	<0.5	<0.5	4280	0.066	376	<0.5	<0.05	47000	<0.5	14	17	5860
Parry Bay Reference Station - Middle	<5	<0.5	1.83	7.9	<0.5	<0.5	4050	0.105	351	<0.5	<0.05	48000	<0.5	7	6	5470
Parry Bay Reference Station - Bottom	<5	<0.5	1.73	6.8	<0.5	<0.5	3950	0.073	344	<0.5	<0.05	48000	<0.5	4	6	5380

Table A9-4: Results for April 22, 2025 (continued)

22-Apr-25	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	N - Nh3 (As N)	N - No2 (As N)	N - No3 (As N)	N - No3 + No2 (As N)	Nickel	pH	Phosphorus	Potassium	Salinity	Selenium
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L		mg/L	mg/L	g/L	µg/L
Constance Bank Reference Station - Top	12	<0.05	147	1060	1.33	<0.0019	9.64	0.083	0.005	0.294	0.299	<0.2	7.72	145	332	31	<0.5
Constance Bank Reference Station - Middle	18	<0.05	155	1100	1.74	<0.0019	9.1	0.052	0.0048	0.307	0.312	<0.2	7.75	142	340	31.2	<0.5
Constance Bank Reference Station - Bottom	16	<0.05	180	1310	1.77	<0.0019	11.5	0.056	0.0047	0.299	0.304	<0.2	7.76	157	394	31.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Top	<10	<0.05	161	1140	1.38	<0.0019	9.68	0.061	0.0054	0.232	0.237	<0.2	7.78	141	345	30.7	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	<10	0.133	160	1080	1.43	<0.0019	9.47	0.067	0.0052	0.239	0.244	<0.2	7.78	154	334	30.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	<10	<0.05	163	1140	1.44	<0.0019	9.75	0.049	0.0051	0.238	0.243	<0.2	7.78	129	351	30.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Top	<10	<0.05	161	1100	1.83	<0.0019	9.63	0.087	0.0053	0.236	0.242	<0.2	7.78	127	342	30.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	<10	<0.05	163	1090	1.47	<0.0019	9	0.13	0.0052	0.237	0.242	<0.2	7.78	150	342	30.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	<10	<0.05	160	1090	1.69	<0.0019	9.6	0.13	0.0052	0.231	0.236	<0.2	7.78	114	345	30.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Top	<10	0.065	161	1060	1.36	<0.0019	9.33	0.074	0.0052	0.234	0.239	<0.2	7.78	116	335	30.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	<10	0.052	153	1020	1.29	<0.0019	9.09	0.12	0.0053	0.235	0.24	<0.2	7.78	125	322	30.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	<10	<0.05	162	1090	1.56	<0.0019	9.49	0.095	0.0063	0.24	0.246	<0.2	7.78	142	345	30.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Top	<10	<0.05	157	1030	1.21	<0.0019	9.58	0.079	0.0054	0.239	0.244	<0.2	7.79	147	325	30.7	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	<10	<0.05	153	1040	1.33	0.0038	9.22	0.087	0.0063	0.237	0.243	<0.2	7.79	130	328	30.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	<10	<0.05	169	1150	1.58	<0.0019	10	0.082	0.0054	0.239	0.244	<0.2	7.79	147	354	30.9	<0.5
Parry Bay Reference Station - Top	<10	<0.05	169	1200	1.78	<0.0019	10.4	0.053	0.0054	0.242	0.247	<0.2	7.77	146	363	30.8	<0.5
Parry Bay Reference Station - Middle	<10	<0.05	160	1120	1.36	<0.0019	10.4	0.063	0.0053	0.29	0.295	<0.2	7.77	135	342	30.9	<0.5
Parry Bay Reference Station - Bottom	<10	<0.05	158	1100	1.21	<0.0019	9.7	0.066	0.0053	0.289	0.295	<0.2	7.77	148	331	31	<0.5

Table A9-4: Results for April 22, 2025 (continued)

22-Apr-25	Silicon	Silver	Strontium	Sulfur	Thallium	Tin	Titanium	TSS	Uranium	Vanadium	Zinc
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
Constance Bank Reference Station - Top	1030	<0.05	6770	788	<0.05	<1	<5	2.4	2.53	1.79	<3
Constance Bank Reference Station - Middle	1120	<0.05	7100	824	<0.05	<1	<5	2.8	2.68	3.11	<3
Constance Bank Reference Station - Bottom	1280	<0.05	8620	979	<0.05	<1	<5	2.8	3.16	3.04	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Top	1090	<0.05	7320	827	<0.05	<1	<5	<1	2.79	3.08	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	1090	<0.05	6990	810	<0.05	<1	<5	2.8	2.69	3.8	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	1160	<0.05	7580	823	<0.05	<1	<5	<1	2.84	3.36	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Top	1040	<0.05	7180	806	<0.05	<1	<5	<1	2.71	2.86	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	1110	<0.05	7180	831	<0.05	<1	<5	<1	2.77	3.09	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	1100	<0.05	7350	777	<0.05	<1	<5	4.4	2.7	3.45	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Top	1140	<0.05	7140	814	<0.05	<1	<5	7.6	2.71	2.72	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	1030	<0.05	6740	742	<0.05	<1	<5	6	2.55	3.24	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	1120	<0.05	7270	799	<0.05	<1	<5	7.2	2.77	3.92	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Top	1030	<0.05	6850	791	<0.05	<1	<5	8	2.68	3.99	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	1050	<0.05	6630	771	<0.05	<1	<5	3.2	2.59	3.43	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	1170	0.073	7710	865	<0.05	<1	<5	8.8	2.9	3.38	<3
Parry Bay Reference Station - Top	1130	<0.05	8030	882	<0.05	<1	<5	1.2	2.94	3.66	<3
Parry Bay Reference Station - Middle	1100	<0.05	7340	796	<0.05	<1	<5	1.2	2.81	3.16	<3
Parry Bay Reference Station - Bottom	1070	<0.05	7060	811	<0.05	<1	<5	1.2	2.72	2.89	<3

Table A9-5: Results for April 29, 2025

29-Apr-25	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Calcium	Chromium	Cobalt	Conductivity	Copper	Enterococci	Fecal Coliforms	Hardness (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µS/cm	µg/L	CFU/100mL	CFU/100mL	mg/L
Constance Bank Reference Station - Top	23	<0.5	2.18	8.3	<0.5	<0.5	4190	0.194	388	<0.5	<0.05	49000	<0.5	<1	2	6130
Constance Bank Reference Station - Middle	27.4	<0.5	2.07	7.3	<0.5	<0.5	3830	0.175	350	<0.5	<0.05	50000	<0.5	<1	61	5360
Constance Bank Reference Station - Bottom	22.1	<0.5	1.98	7.5	<0.5	<0.5	4140	0.1	388	<0.5	<0.05	49000	<0.5	<1	<1	5930
McLoughlin Point - Receiving Water - IDZ Station 1 Top	11.3	<0.5	2.06	6.4	<0.5	<0.5	3870	0.072	348	<0.5	<0.05	49000	<0.5	<1	<1	5380
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	15.3	<0.5	1.75	6.8	<0.5	<0.5	3790	0.096	351	<0.5	<0.05	49000	<0.5	13	65	5360
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	16.5	<0.5	1.91	7.8	<0.5	<0.5	4130	0.074	376	<0.5	<0.05	49000	<0.5	14	66	5840
McLoughlin Point - Receiving Water - IDZ Station 2 Top	12.8	<0.5	1.99	6.8	<0.5	<0.5	3800	0.084	351	<0.5	<0.05	49000	<0.5	<1	<1	5330
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	12	<0.5	1.71	7.9	<0.5	<0.5	3890	0.081	358	<0.5	<0.05	49000	0.55	1	14	5410
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	12.4	<0.5	1.86	7.3	<0.5	<0.5	3850	0.043	343	<0.5	<0.05	49000	<0.5	1	7	5290
McLoughlin Point - Receiving Water - IDZ Station 3 Top	12	<0.5	2.07	7.7	<0.5	<0.5	4050	0.105	368	<0.5	<0.05	49000	<0.5	<1	<1	5720
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	10	<0.5	1.95	6.5	<0.5	<0.5	3780	0.044	333	<0.5	<0.05	49000	<0.5	<1	1	5110
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	16.4	<0.5	2.34	7.1	<0.5	<0.5	4000	0.141	373	<0.5	<0.05	49000	<0.5	1	9	5830
McLoughlin Point - Receiving Water - IDZ Station 4 Top	12.5	<0.5	1.97	7.8	<0.5	<0.5	3980	0.118	362	<0.5	<0.05	49000	<0.5	<1	<1	5690
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	16	<0.5	1.83	6.6	<0.5	<0.5	3750	0.081	332	<0.5	<0.05	49000	<0.5	1	13	5210
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	10.1	<0.5	2.04	7.4	<0.5	<0.5	3980	0.025	371	<0.5	<0.05	49000	0.53	4	30	5820
Parry Bay Reference Station - Top	11.9	<0.5	2.1	8.1	<0.5	<0.5	4040	0.045	368	<0.5	<0.05	49000	<0.5	<1	<1	5670
Parry Bay Reference Station - Middle	12.7	<0.5	1.81	7.1	<0.5	<0.5	3860	0.101	346	<0.5	<0.05	49000	<0.5	<1	<1	5270
Parry Bay Reference Station - Bottom	32.4	<0.5	1.9	6.9	<0.5	<0.5	3900	0.054	356	0.51	<0.05	49000	<0.5	<1	1	5490

Table A9-5: Results for April 29, 2025 (continued)

29-Apr-25	Iron	Lead	Lithium	Magnesium	Manganese	Mercury	Molybdenum	N - Nh3 (As N)	N - No2 (As N)	N - No3 (As N)	N - No3 + No2 (As N)	Nickel	pH	Phosphorus	Potassium	Salinity	Selenium
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L		mg/L	mg/L	g/L	µg/L
Constance Bank Reference Station - Top	36	<0.05	167	1250	1.77	<0.0019	10.6	0.047	0.0025	0.323	0.325	<0.2	7.68	139	375	31.9	<0.5
Constance Bank Reference Station - Middle	30	0.641	150	1090	1.36	<0.0019	9.31	0.043	0.0021	0.359	0.361	<0.2	7.73	101	336	32.6	<0.5
Constance Bank Reference Station - Bottom	16	<0.05	162	1200	1.41	<0.0019	9.9	0.067	0.0025	0.326	0.329	<0.2	7.76	115	369	32	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Top	11	<0.05	152	1100	1.26	<0.0019	9.06	0.052	0.0027	0.312	0.315	0.21	7.79	104	338	31.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	11	<0.05	150	1090	0.94	<0.0019	9.4	0.075	0.0024	0.321	0.324	<0.2	7.78	115	342	32.1	<0.5
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	17	<0.05	159	1190	1.14	<0.0019	9.63	0.068	0.0027	0.328	0.331	<0.2	7.76	134	365	32.2	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Top	<10	<0.05	146	1080	1.54	<0.0019	9.6	0.061	0.0026	0.316	0.319	<0.2	7.79	96	343	31.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	17	<0.05	149	1100	1.14	<0.0019	8.54	0.054	0.0026	0.323	0.326	<0.2	7.78	111	342	32	<0.5
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	13	0.44	151	1080	1.03	<0.0019	9.14	0.055	0.0025	0.322	0.324	<0.2	7.79	100	342	32	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Top	<10	<0.05	156	1160	1.16	<0.0019	9.38	0.057	0.0028	0.308	0.311	<0.2	7.79	98	359	31.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	<10	<0.05	144	1040	1.07	<0.0019	8.76	0.056	0.0027	0.313	0.316	<0.2	7.8	110	326	31.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	18	<0.05	155	1190	1.28	<0.0019	10.4	0.068	0.0028	0.323	0.326	<0.2	7.78	96	367	32	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Top	12	0.08	153	1160	1.36	<0.0019	9.62	0.061	0.0027	0.311	0.314	<0.2	7.79	94	349	31.8	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	12	<0.05	143	1060	1.14	<0.0019	8.8	0.06	0.0026	0.316	0.319	<0.2	7.79	99	337	31.9	<0.5
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	<10	<0.05	154	1190	1.15	<0.0019	9.74	0.067	0.0027	0.323	0.326	<0.2	7.78	118	367	32	<0.5
Parry Bay Reference Station - Top	<10	<0.05	156	1150	1.3	<0.0019	9.64	0.056	0.0024	0.321	0.324	<0.2	7.78	118	355	32	<0.5
Parry Bay Reference Station - Middle	10	<0.05	150	1070	1.03	<0.0019	8.91	0.052	0.0026	0.329	0.332	<0.2	7.76	101	328	32.1	<0.5
Parry Bay Reference Station - Bottom	49	<0.05	151	1120	1.85	<0.0019	8.81	0.049	0.0026	0.334	0.337	<0.2	7.76	111	346	32.2	<0.5

Table A9-5: Results for April 29, 2025 (continued)

29-Apr-25	Silicon	Silver	Strontium	Sulfur	Thallium	Tin	Titanium	TSS	Uranium	Vanadium	Zinc
	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
Constance Bank Reference Station - Top	1260	<0.05	7990	888	<0.05	<1	<5	5.2	3.22	1.72	<3
Constance Bank Reference Station - Middle	1210	<0.05	7050	773	<0.05	<1	<5	3.6	2.74	3.16	<3
Constance Bank Reference Station - Bottom	1260	<0.05	7800	905	<0.05	<1	<5	1.6	3.12	4.19	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Top	1100	<0.05	7070	811	<0.05	<1	<5	1.2	2.83	4.1	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Middle	1140	<0.05	7030	820	<0.05	<1	<5	1.6	2.75	3.73	<3
McLoughlin Point - Receiving Water - IDZ Station 1 Bottom	1250	<0.05	7840	897	<0.05	<1	<5	1.6	3.11	4	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Top	1120	<0.05	6970	807	<0.05	<1	<5	1.6	2.8	4.31	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Middle	1140	<0.05	7180	814	<0.05	<1	<5	1.2	2.83	4.22	<3
McLoughlin Point - Receiving Water - IDZ Station 2 Bottom	1160	<0.05	7130	774	<0.05	<1	<5	6.8	2.69	3.79	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Top	1170	<0.05	7640	883	<0.05	<1	<5	6	3	4.06	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Middle	1040	<0.05	6750	748	<0.05	<1	<5	5.2	2.69	3.27	<3
McLoughlin Point - Receiving Water - IDZ Station 3 Bottom	1220	<0.05	7760	863	<0.05	<1	<5	5.2	3.14	4.16	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Top	1160	<0.05	7450	817	<0.05	<1	<5	4.4	2.95	4.84	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Middle	1090	<0.05	6890	768	<0.05	<1	<5	7.6	2.63	4.48	<3
McLoughlin Point - Receiving Water - IDZ Station 4 Bottom	1180	<0.05	7630	842	<0.05	<1	<5	4.4	3.02	4.05	<3
Parry Bay Reference Station - Top	1170	<0.05	7500	871	<0.05	<1	<5	<1	2.89	4.04	<3
Parry Bay Reference Station - Middle	1140	<0.05	7040	779	<0.05	<1	<5	1.2	2.68	3.16	<3
Parry Bay Reference Station - Bottom	1180	<0.05	7230	796	<0.05	<1	<5	4.4	2.82	3.22	<3

APPENDIX 10

IDZ Analytical Results compared to applicable Water Quality Guidelines

Table A10-1

Fecal Coliforms (CFU/100 mL)							
	Historical BC WQG GeoMean 200 CFU/100 mL						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Geomean
Reference Constance	Top	2	4	1	2	2	2
	Middle	1	6	1	<1	61	3
	Bottom	<1	9	2	6	<1	2
Reference Parry Bay	Top	6	39	27	17	<1	9
	Middle	3	20	38	6	<1	6
	Bottom	5	24	39	6	1	8
Station 1	Top	5	30	1,100	37	<1	20
	Middle	73	39	110	64	65	67
	Bottom	840	110	580	6	66	116
Station 2	Top	3	34	31	97	<1	11
	Middle	1,000	42	120	150	14	101
	Bottom	1,100	95	860	150	7	157
Station 3	Top	<1	28	550	27	<1	10
	Middle	380	18	910	130	1	60
	Bottom	83	49	940	98	9	80
Station 4	Top	3	26	140	1	<1	6
	Middle	11	74	160	39	13	37
	Bottom	12	65	37	37	30	32

Table A10-2

Enterococci (CFU/100 mL)							
	Health Canada GeoMean 35 CFU/100 mL and Max 70 CFU/100 mL						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Geomean
Reference Constance	Top	5	<1	<1	<1	<1	1
	Middle	<1	2	<1	1	<1	1
	Bottom	2	1	<1	<1	<1	1
Reference Parry Bay	Top	6	24	6	14	<1	6
	Middle	2	9	22	7	<1	4
	Bottom	3	14	24	4	<1	5
Station 1	Top	3	19	930	19	<1	14
	Middle	73	29	66	66	13	41
	Bottom	980	95	130	<1	14	39
Station 2	Top	1	19	6	78	<1	5
	Middle	2,100	33	73	120	1	57
	Bottom	1,100	71	600	130	1	91
Station 3	Top	<1	15	78	24	<1	6
	Middle	570	44	710	110	<1	63
	Bottom	74	40	660	91	1	45
Station 4	Top	2	18	56	<1	<1	3
	Middle	8	68	60	39	1	17
	Bottom	6	50	7	26	4	12

Table A10-3

Ammonia – NH3 (mg/L)							
	BC Approved WQG = 20 mg/L N (average over 5 samples) or 148 mg/L N (max) for the protection of aquatic life						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Average
Reference Constance	Top	0.058	0.058	0.059	0.083	0.047	0.061
	Middle	0.064	0.05	0.048	0.052	0.043	0.051
	Bottom	0.053	0.055	0.06	0.056	0.067	0.058
Reference Parry Bay	Top	0.059	0.063	0.057	0.053	0.056	0.058
	Middle	0.058	0.056	0.067	0.063	0.052	0.059
	Bottom	0.051	0.063	0.06	0.066	0.049	0.058
Station 1	Top	0.055	0.07	0.17	0.061	0.052	0.082
	Middle	0.053	0.061	0.066	0.067	0.075	0.064
	Bottom	0.098	0.067	0.14	0.049	0.068	0.084
Station 2	Top	0.048	0.07	0.069	0.087	0.061	0.067
	Middle	0.14	0.058	0.083	0.13	0.054	0.093
	Bottom	0.14	0.068	0.098	0.13	0.055	0.098
Station 3	Top	0.043	0.065	0.079	0.074	0.057	0.064
	Middle	0.091	0.058	0.099	0.12	0.056	0.085
	Bottom	0.079	0.059	0.12	0.095	0.068	0.084
Station 4	Top	0.044	0.068	0.079	0.079	0.061	0.066
	Middle	0.041	0.07	0.068	0.087	0.06	0.065
	Bottom	0.055	0.058	0.055	0.082	0.067	0.063

Table A10-4

Silver (µg/L)							
	BC Approved WQG for protection of marine aquatic life = 3 µg/L (GeoMean over 5 samples) or 1.5 mg/L (max)						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Geomean
Reference Constance	Top	<0.05	0.053	<0.05	<0.05	<0.05	0.03
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Reference Parry Bay	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 1	Top	0.056	<0.05	<0.05	<0.05	<0.05	0.03
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	0.051	<0.05	<0.05	<0.05	<0.05	0.03
Station 2	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 3	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 4	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	0.076	<0.05	<0.05	<0.05	<0.05	0.03
	Bottom	<0.05	<0.05	<0.05	0.073	<0.05	0.03

Table A10-5

Arsenic (µg/L)						
	BC Approved WQG = 12.5 µg/L (max) for the protection of aquatic life					
		During Bypass		Post Bypass		
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr
Reference Constance	Top	1.37	1.66	1.5	1.64	2.18
	Middle	1.59	1.33	1.6	1.73	2.07
	Bottom	2.05	1.94	2.03	2.07	1.98
Reference Parry Bay	Top	1.57	1.85	1.73	1.82	2.1
	Middle	2.04	1.61	1.9	1.83	1.81
	Bottom	1.91	1.66	1.89	1.73	1.9
Station 1	Top	1.86	1.78	1.7	1.66	2.06
	Middle	1.83	1.89	1.24	1.88	1.75
	Bottom	1.54	1.82	2.11	1.94	1.91
Station 2	Top	1.7	1.67	2.09	1.79	1.99
	Middle	1.76	2.07	2.02	1.78	1.71
	Bottom	1.9	1.49	1.74	2.18	1.86
Station 3	Top	1.63	1.81	1.96	1.97	2.07
	Middle	1.7	1.78	1.46	1.84	1.95
	Bottom	1.78	1.72	1.91	1.5	2.34
Station 4	Top	1.84	1.81	2.12	2.01	1.97
	Middle	1.8	1.57	2.05	1.88	1.83
	Bottom	1.87	2.09	1.78	1.74	2.04

Table A10-6

Boron (µg/L)						
	BC Approved WQG = 1200 µg/L (max) for the protection of aquatic life					
		During Bypass		Post Bypass		
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr
Reference Constance	Top	3,800	3,770	3,710	3,820	4,190
	Middle	3,980	3,800	3,720	4,000	3,830
	Bottom	4,080	3,940	3,860	4,580	4,140
Reference Parry Bay	Top	4,010	3,670	3,790	4,280	4,040
	Middle	4,130	3,850	3,930	4,050	3,860
	Bottom	4,120	3,800	4,020	3,950	3,900
Station 1	Top	4,060	3,830	3,890	4,090	3,870
	Middle	4,140	3,770	3,670	4,050	3,790
	Bottom	4,200	3,880	3,820	4,150	4,130
Station 2	Top	4,250	3,560	3,900	4,030	3,800
	Middle	4,180	3,610	3,860	4,030	3,890
	Bottom	4,280	3,490	3,820	4,020	3,850
Station 3	Top	4,200	3,860	3,960	4,020	4,050
	Middle	4,170	3,560	3,680	3,820	3,780
	Bottom	4,200	3,770	3,830	4,090	4,000
Station 4	Top	4,340	3,920	3,810	3,920	3,980
	Middle	4,200	3,650	3,900	3,940	3,750
	Bottom	4,470	3,800	3,760	4,220	3,980

Table A10-7

Cadmium (µg/L)						
	BC Working WQG = 0.12 µg/L (max) for the protection of shellfish consumers					
		During Bypass		Post Bypass		
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr
Reference Constance	Top	<0.032	<0.088	0.044	<0.047	<0.194
	Middle	<0.075	<0.072	<0.065	<0.069	<0.175
	Bottom	<0.06	<0.041	<0.032	<0.051	<0.1
Reference Parry Bay	Top	<0.073	<0.033	<0.043	<0.066	<0.045
	Middle	<0.053	<0.066	<0.043	<0.105	<0.101
	Bottom	<0.093	<0.018	<0.071	<0.073	<0.054
Station 1	Top	<0.053	<0.035	<0.065	<0.069	<0.072
	Middle	<0.033	<0.066	<0.035	<0.047	<0.096
	Bottom	<0.042	<0.229	<0.082	<0.087	<0.074
Station 2	Top	<0.075	<0.169	<0.054	<0.086	<0.084
	Middle	<0.054	<0.217	<0.029	<0.027	0.081
	Bottom	<0.1	<0.045	<0.058	<0.067	<0.043
Station 3	Top	<0.041	<0.078	<0.035	<0.066	<0.105
	Middle	<0.048	<0.087	<0.085	<0.045	<0.044
	Bottom	<0.036	<0.037	<0.039	<0.117	<0.141
Station 4	Top	<0.069	<0.026	<0.059	<0.098	<0.118
	Middle	<0.068	<0.045	<0.085	<0.019	<0.081
	Bottom	<0.026	<0.028	<0.056	<0.051	0.025

Table A10-8

Copper (µg/L)							
	BC Approved WQG = 2 µg/L (average over 5 samples) or 3 µg/L (max)						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Average
Reference Constance	Top	<0.5	<0.5	0.9	<0.5	<0.5	0.4
	Middle	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Bottom	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Reference Parry Bay	Top	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Middle	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Bottom	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Station 1	Top	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Middle	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Bottom	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Station 2	Top	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Middle	<0.5	<0.5	<0.5	<0.5	0.55	0.3
	Bottom	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Station 3	Top	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Middle	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Bottom	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Station 4	Top	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Middle	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Bottom	<0.5	<0.5	<0.5	<0.5	0.53	0.3

Table A10-9

Lead (µg/L)							
	BC Approved WQG = 2 µg/L (average over 5 samples) or 140 µg/L (max)						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Average
Reference Constance	Top	<0.05	<0.05	0.961	<0.05	<0.05	0.21
	Middle	<0.05	<0.05	0.264	<0.05	0.641	0.20
	Bottom	<0.05	<0.05	5.74	<0.05	<0.05	1.17
Reference Parry Bay	Top	<0.05	<0.05	0.122	<0.05	<0.05	0.04
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 1	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	<0.05	<0.05	<0.05	0.133	<0.05	0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 2	Top	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	0.44	0.11
Station 3	Top	<0.05	<0.05	<0.05	0.065	<0.05	0.03
	Middle	<0.05	<0.05	<0.05	0.052	<0.05	0.03
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Station 4	Top	<0.05	<0.05	<0.05	<0.05	0.08	0.04
	Middle	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Bottom	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Table A10-10

Manganese (µg/L)						
	BC Approved WQG = 100 µg/L (max) for the protection of aquatic life					
		During Bypass		Post Bypass		
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr
Reference Constance	Top	1.1	1.52	0.82	1.33	1.77
	Middle	1.11	1.3	1.8	1.74	1.36
	Bottom	1.05	1.58	1.76	1.77	1.41
Reference Parry Bay	Top	1.25	1.02	1.69	1.78	1.3
	Middle	1.49	0.99	0.77	1.36	1.03
	Bottom	1.45	0.95	0.99	1.21	1.85
Station 1	Top	1.2	1.08	1.07	1.38	1.26
	Middle	1.25	1.06	0.9	1.43	0.94
	Bottom	1.2	2.06	0.88	1.44	1.14
Station 2	Top	1.27	1.05	0.65	1.83	1.54
	Middle	1.44	1.69	0.72	1.47	1.14
	Bottom	1.28	0.94	0.76	1.69	1.03
Station 3	Top	1.21	0.82	0.8	1.36	1.16
	Middle	1.24	0.89	0.88	1.29	1.07
	Bottom	1.12	0.67	0.89	1.56	1.28
Station 4	Top	1.58	1.04	0.91	1.21	1.36
	Middle	1.17	0.87	0.93	1.33	1.14
	Bottom	1.33	1.02	1.03	1.58	1.15

Table A10-11

Nickel (µg/L)						
	BC Approved WQG = 8.3 µg/L (max) for the protection of aquatic life					
		During Bypass		Post Bypass		
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr
Reference Constance	Top	<0.2	<0.2	<0.2	<0.2	<0.2
	Middle	<0.2	<0.2	0.67	<0.2	<0.2
	Bottom	<0.2	<0.2	0.44	<0.2	<0.2
Reference Parry Bay	Top	<0.2	<0.2	0.66	<0.2	<0.2
	Middle	<0.2	1.26	<0.2	<0.2	<0.2
	Bottom	<0.2	<0.2	0.26	<0.2	<0.2
Station 1	Top	<0.2	<0.2	<0.2	<0.2	0.21
	Middle	<0.2	0.81	0.26	<0.2	<0.2
	Bottom	<0.2	1.63	<0.2	<0.2	<0.2
Station 2	Top	<0.2	0.67	<0.2	<0.2	<0.2
	Middle	<0.2	1.62	0.89	<0.2	<0.2
	Bottom	<0.2	<0.2	<0.2	<0.2	<0.2
Station 3	Top	<0.2	<0.2	<0.2	<0.2	<0.2
	Middle	<0.2	<0.2	<0.2	<0.2	<0.2
	Bottom	<0.2	<0.2	<0.2	<0.2	<0.2
Station 4	Top	<0.2	<0.2	<0.2	<0.2	<0.2
	Middle	<0.2	0.33	<0.2	<0.2	<0.2
	Bottom	<0.2	0.22	<0.2	<0.2	<0.2

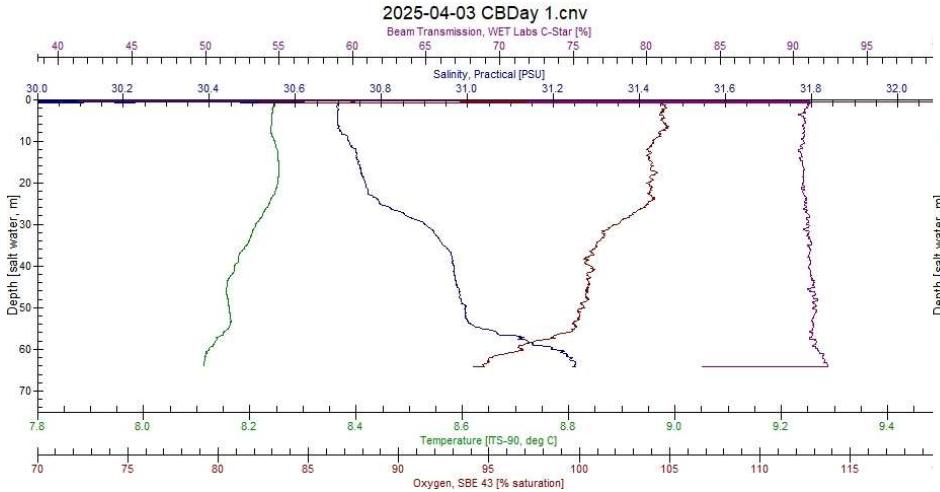
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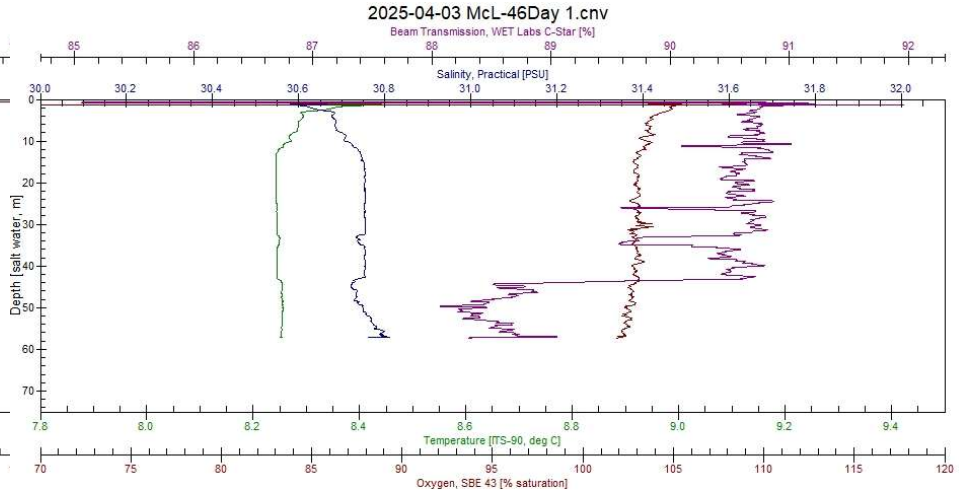
Zinc (µg/L)							
	BC Approved WQG = 10 µg/L (average over 5 samples) for the protection of aquatic life						
		During Bypass		Post Bypass			
		03-Apr	09-Apr	15-Apr	22-Apr	29-Apr	Average
Reference Constance	Top	<3	<3	<3	<3	<3	<3
	Middle	<3	6	15	<3	<3	5
	Bottom	<3	<3	13	<3	<3	4
Reference Parry Bay	Top	<3	<3	12	<3	<3	4
	Middle	<3	52.7	<3	<3	<3	12
	Bottom	<3	<3	<3	<3	<3	<3
Station 1	Top	<3	<3	<3	<3	<3	<3
	Middle	<3	44	<3	<3	<3	10
	Bottom	<3	83	<3	<3	<3	18
Station 2	Top	<3	39	<3	<3	<3	9
	Middle	<3	81	<3	<3	<3	18
	Bottom	<3	<3	<3	<3	<3	<3
Station 3	Top	<3	<3	<3	<3	<3	<3
	Middle	<3	<3	<3	<3	<3	<3
	Bottom	<3	<3	<3	<3	<3	<3
Station 4	Top	6.6	<3	<3	<3	<3	3
	Middle	<3	15	<3	<3	<3	4
	Bottom	<3	<3	<3	<3	<3	<3

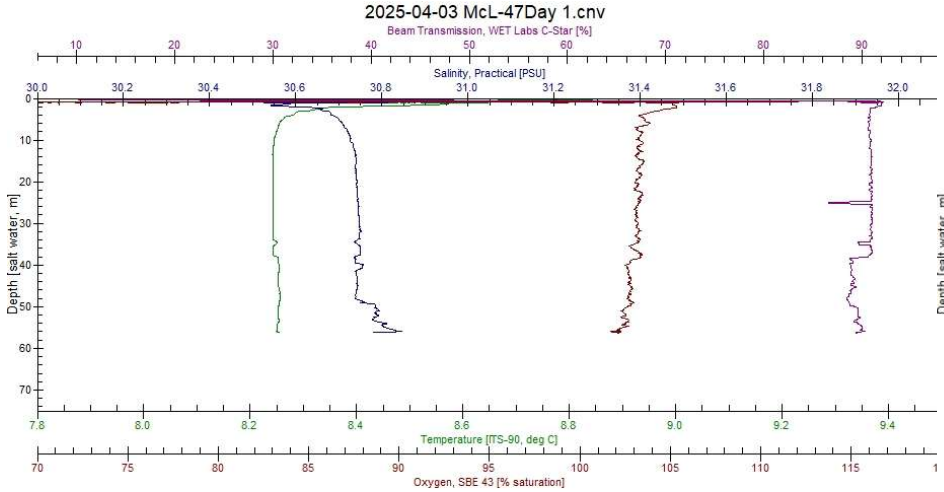
Note: *Shaded cells indicate exceedance to BC WQG. For those results that are below the detection limit, ½ of detection limit was used for calculations.*

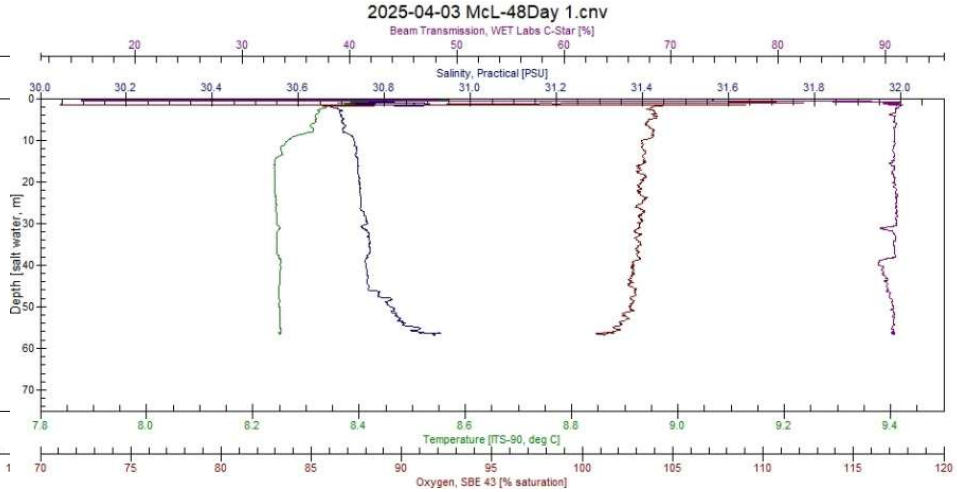
APPENDIX 11 – IDZ CTD Casts

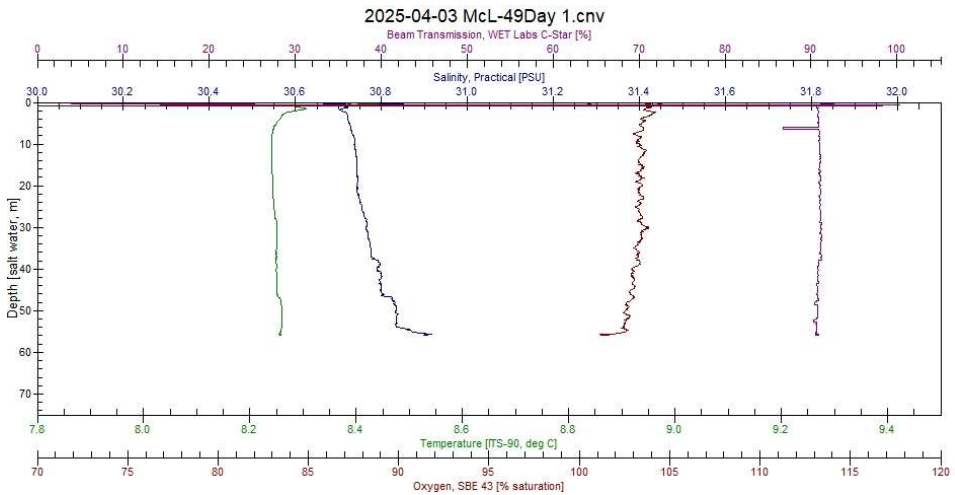
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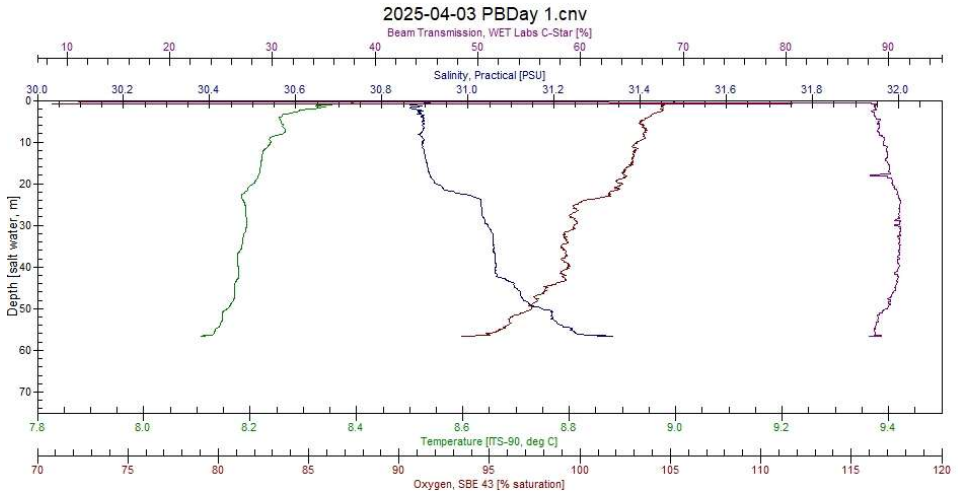


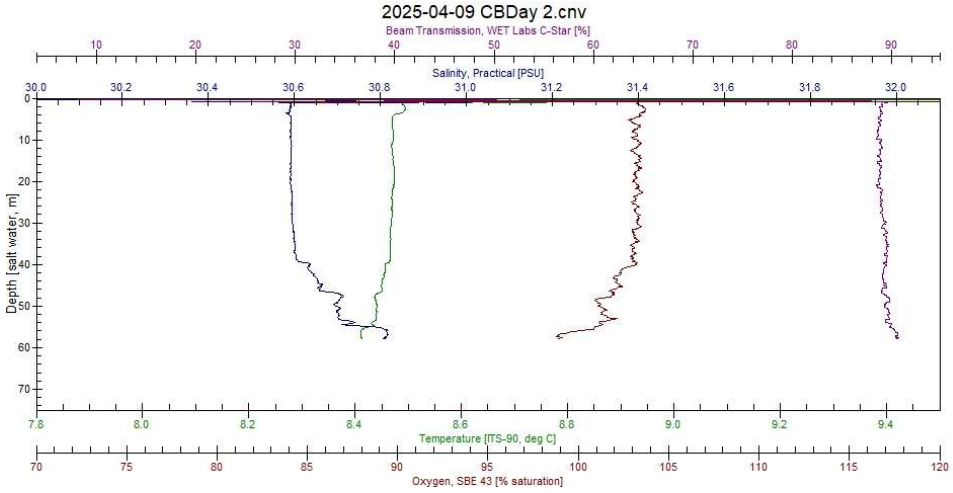


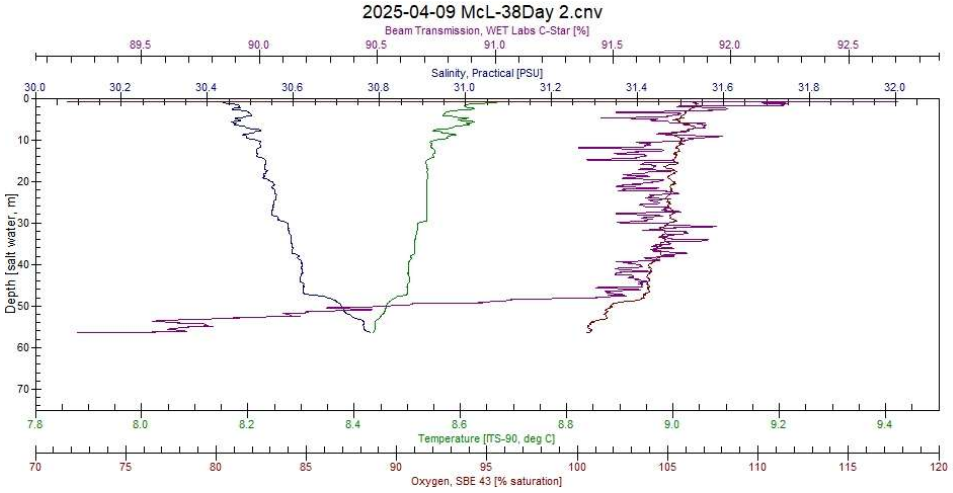


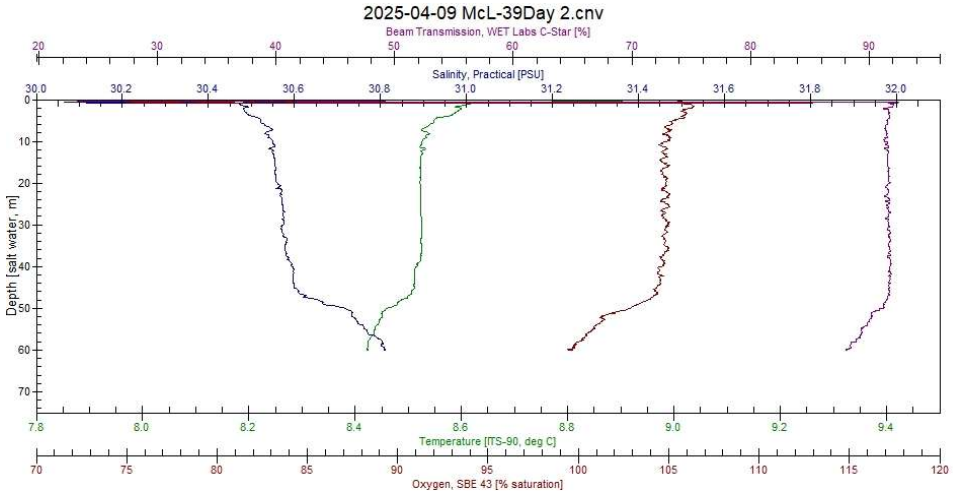


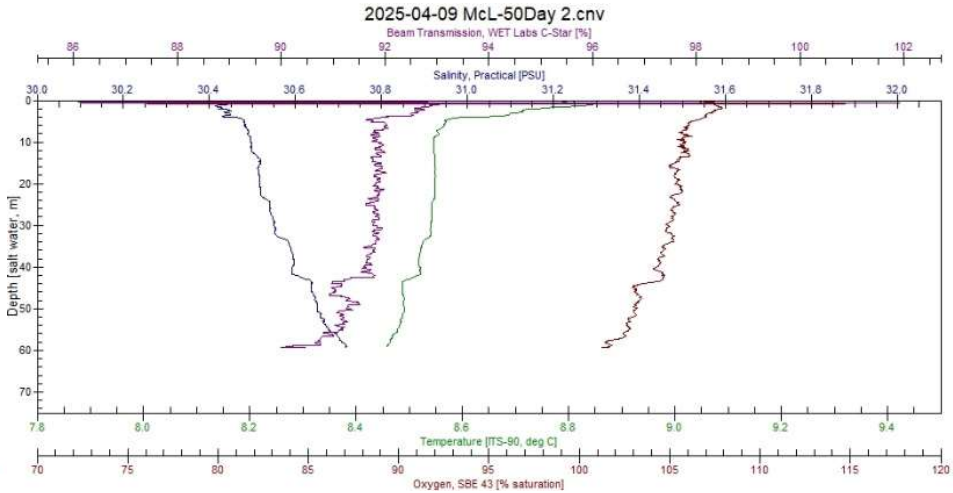

2025-04-03 McL-49Day 1.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

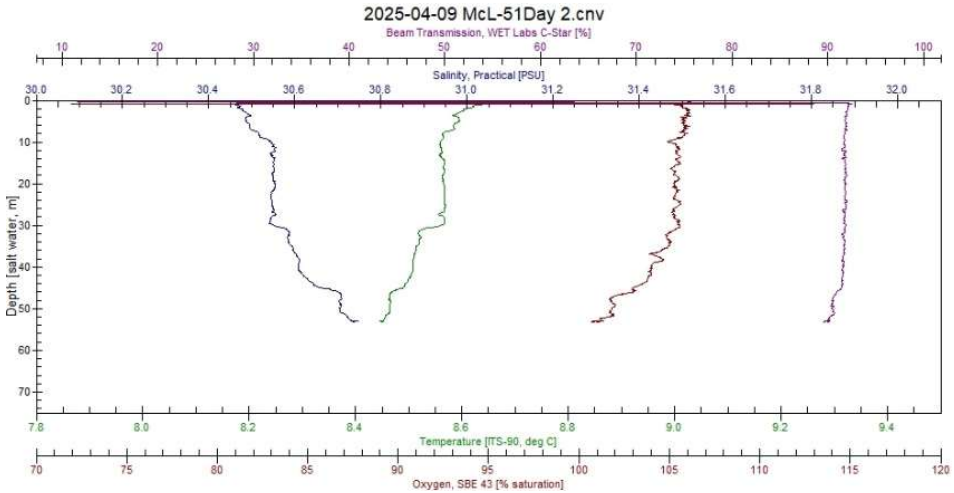

2025-04-03 PBDay 1.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

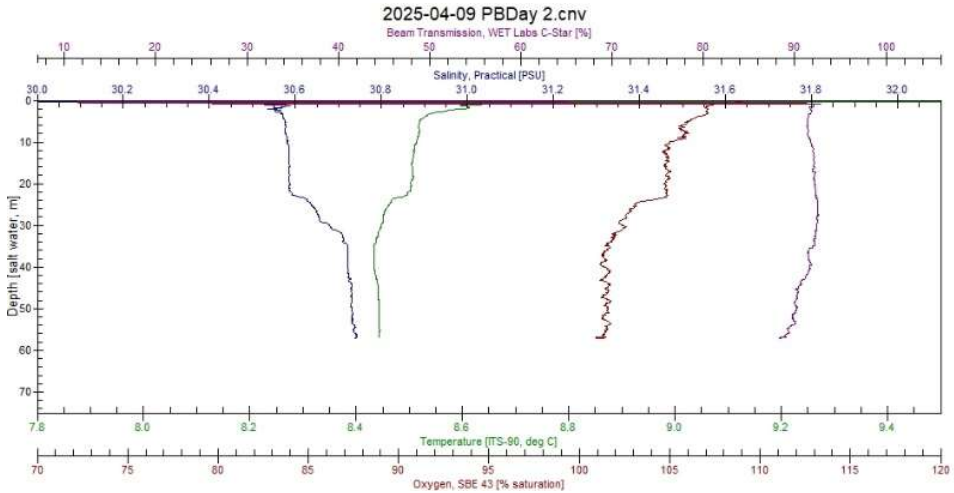

2025-04-09 CBDay 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-09 McL-38Day 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

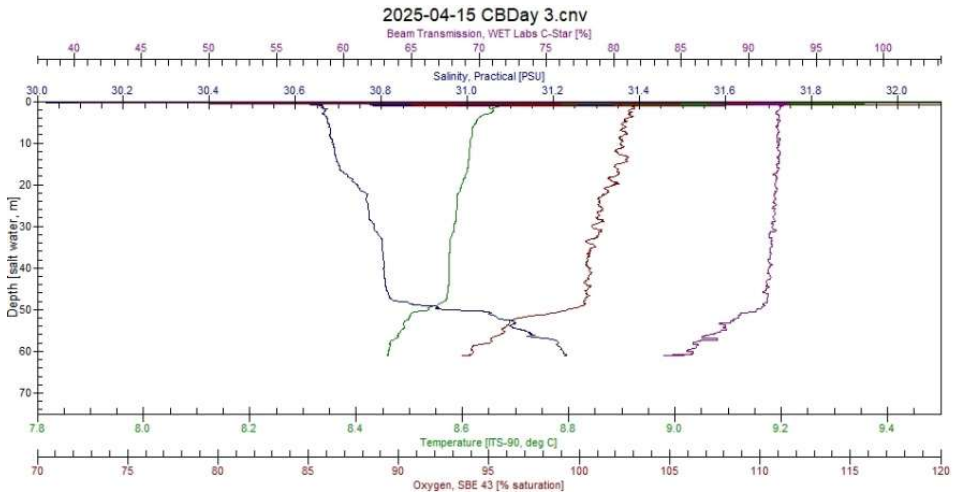

2025-04-09 McL-39Day 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

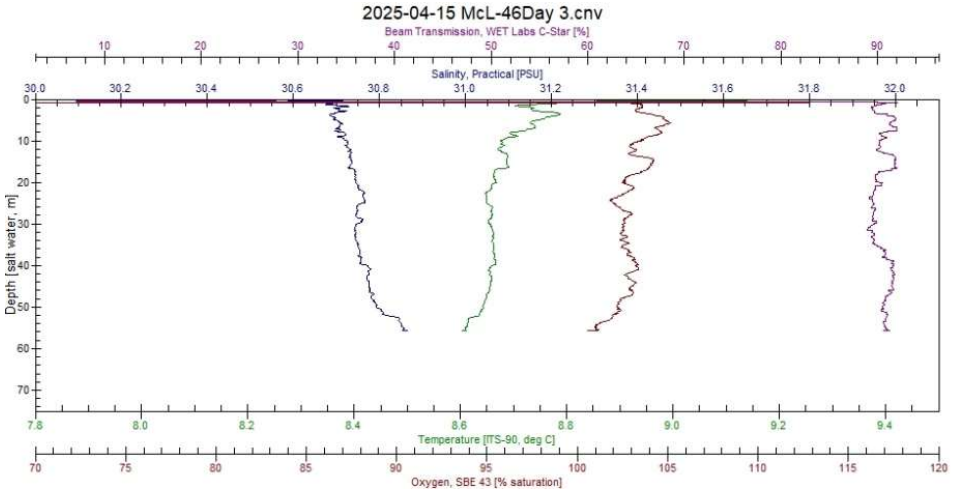

2025-04-09 McL-50Day 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

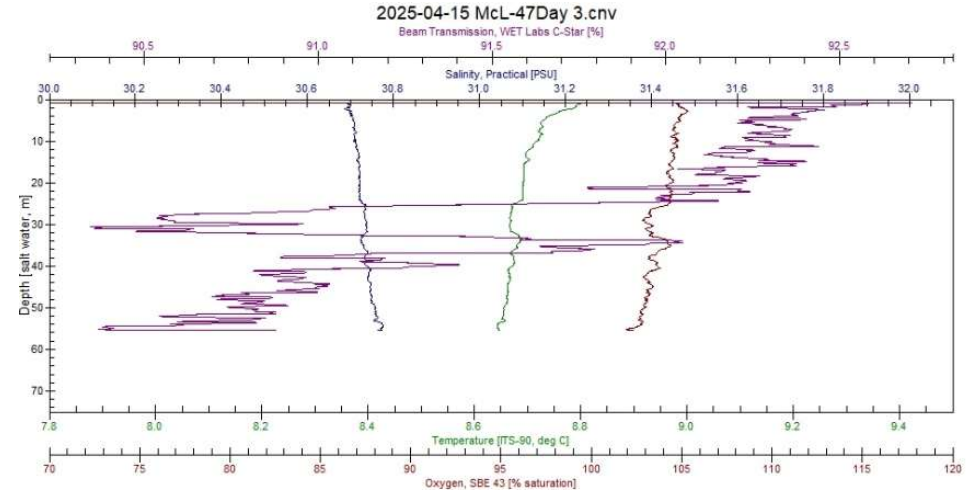

2025-04-09 McL-51Day 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

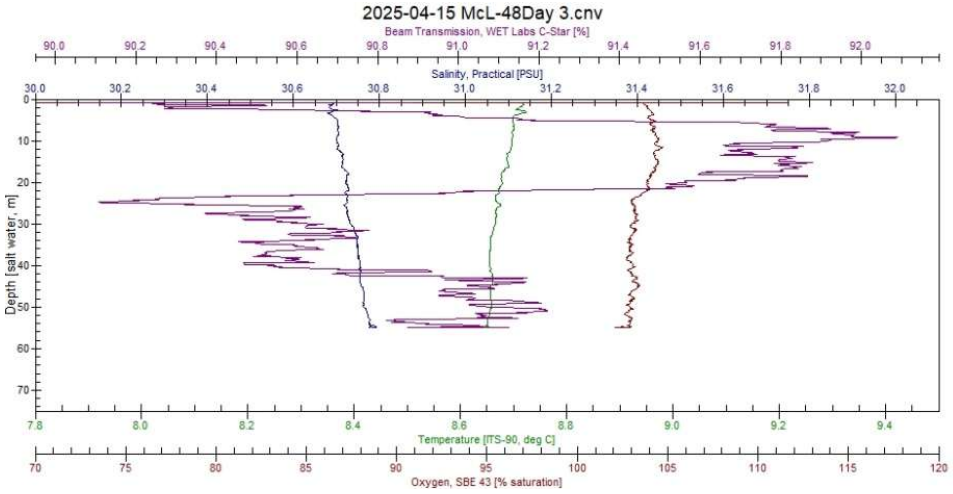

2025-04-09 PBDay 2.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

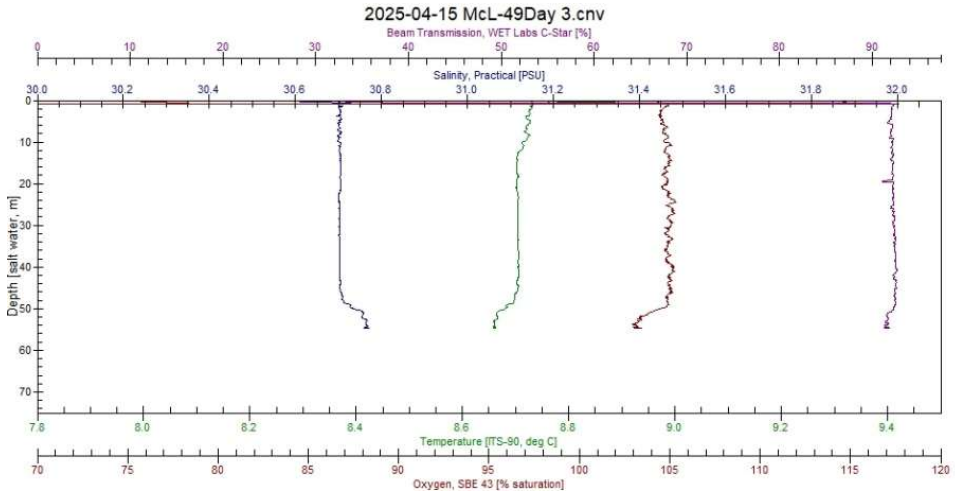
After bypass:

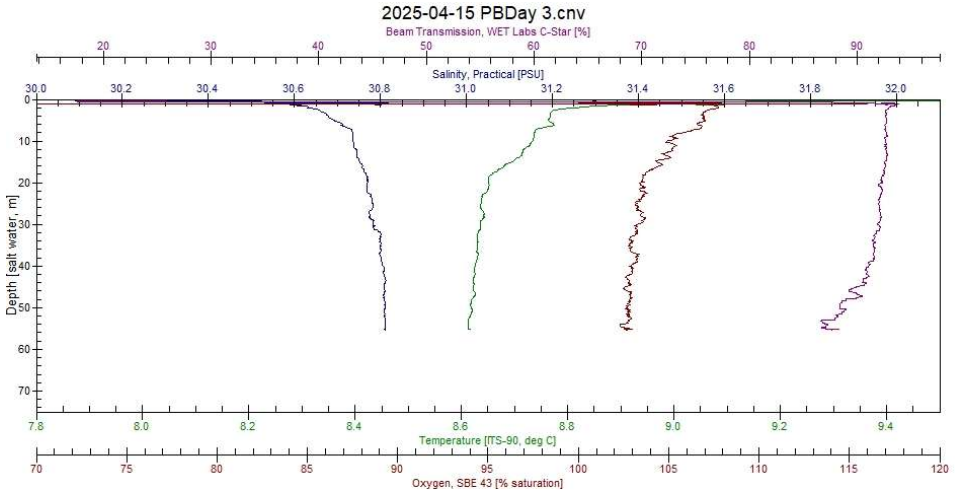


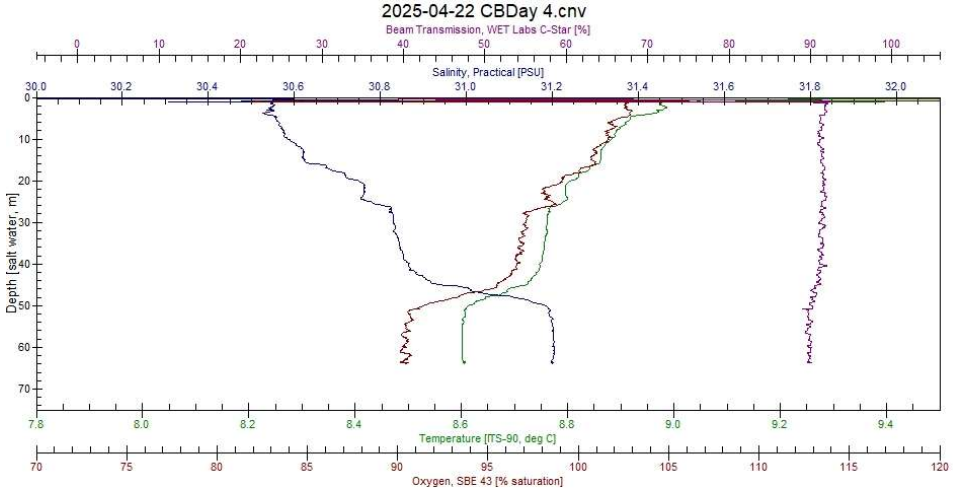


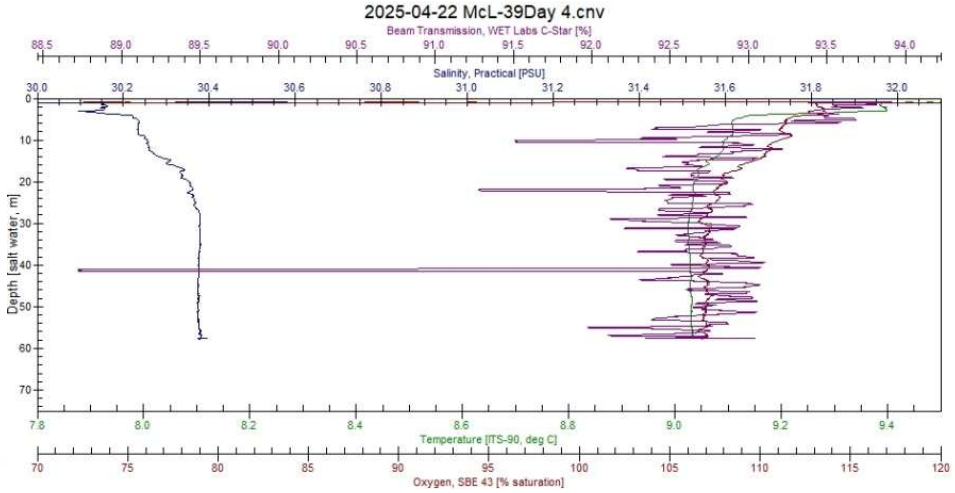


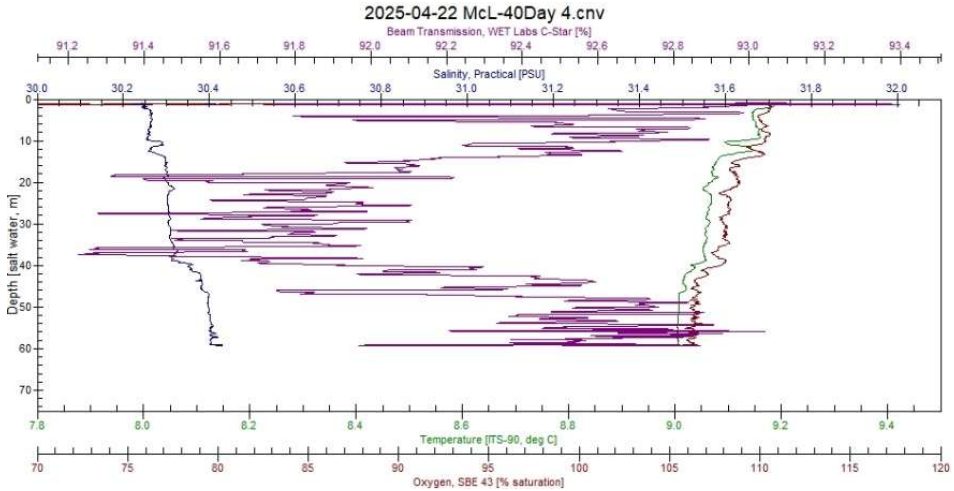


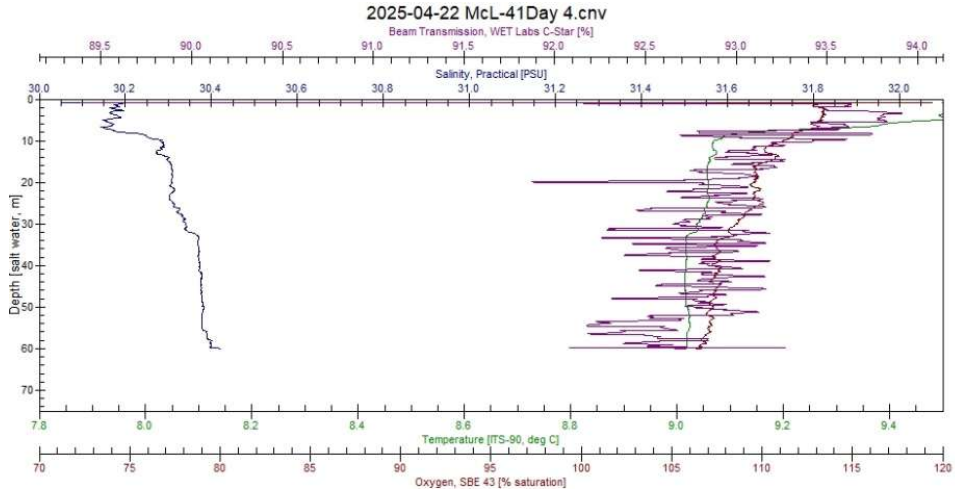

2025-04-15 McL-49Day 3.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

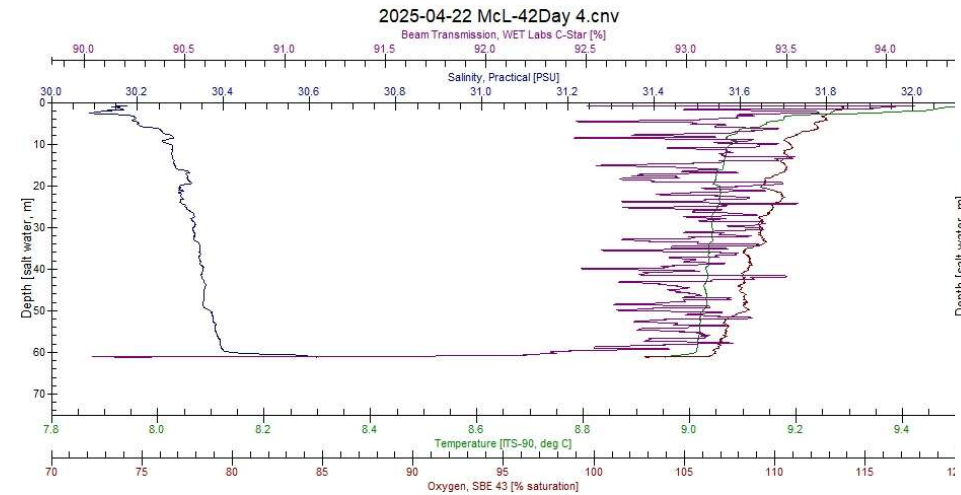

2025-04-15 PBDay 3.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

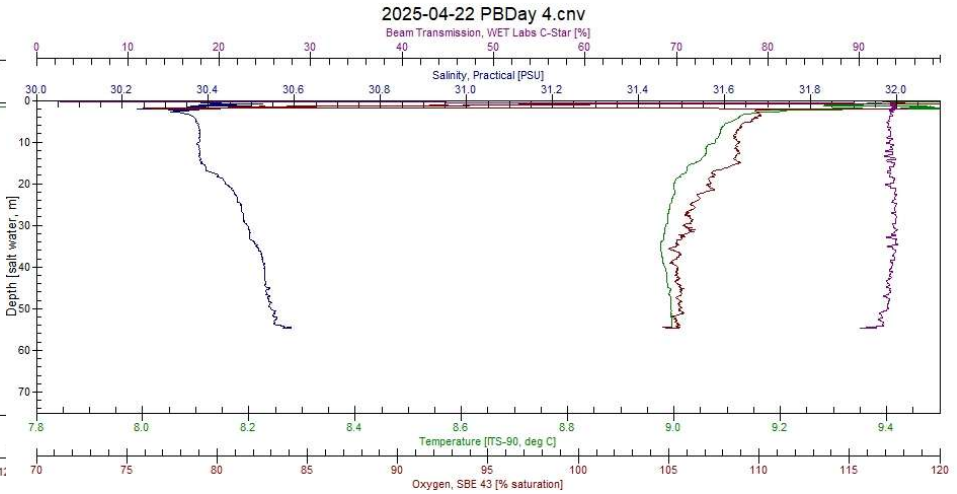

2025-04-22 CBDay 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

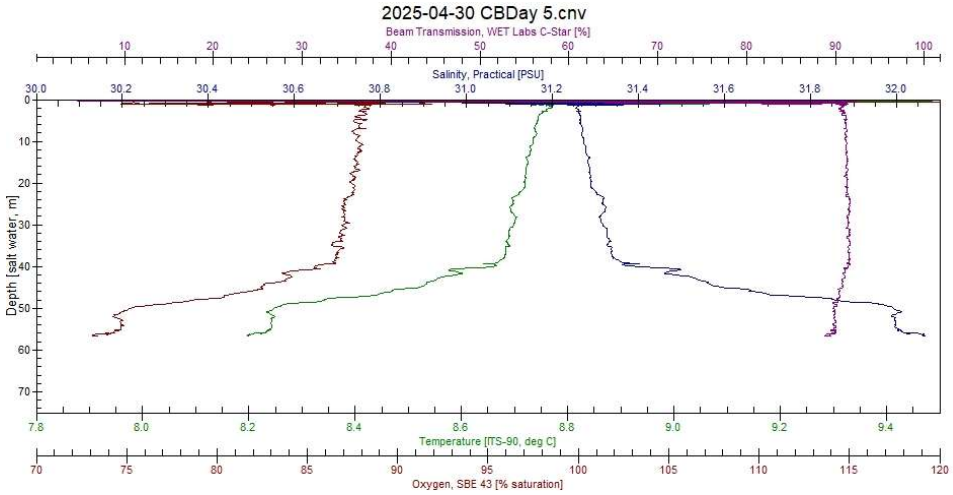

2025-04-22 McL-39Day 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

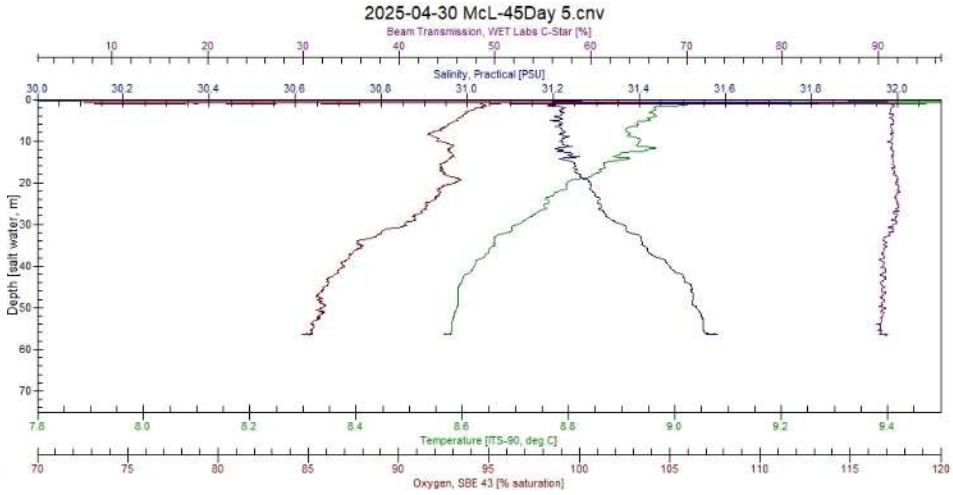

2025-04-22 McL-40Day 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

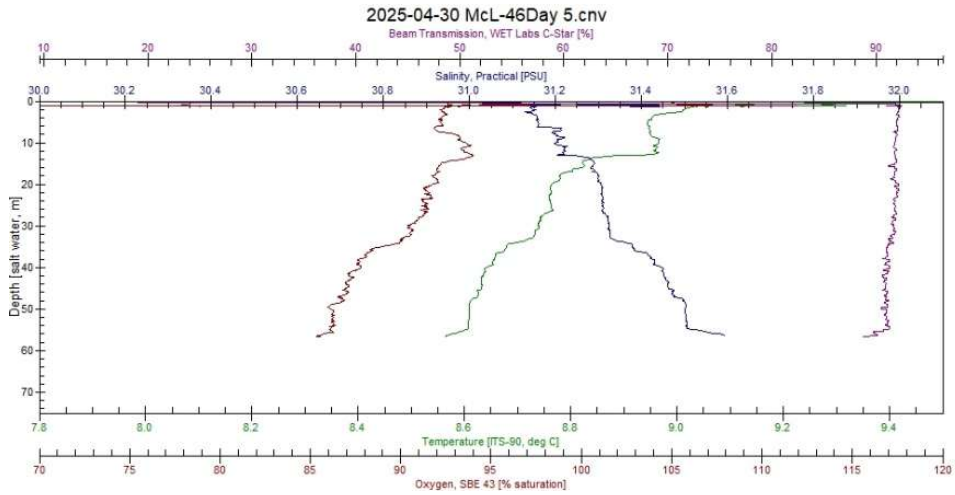

2025-04-22 McL-41Day 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

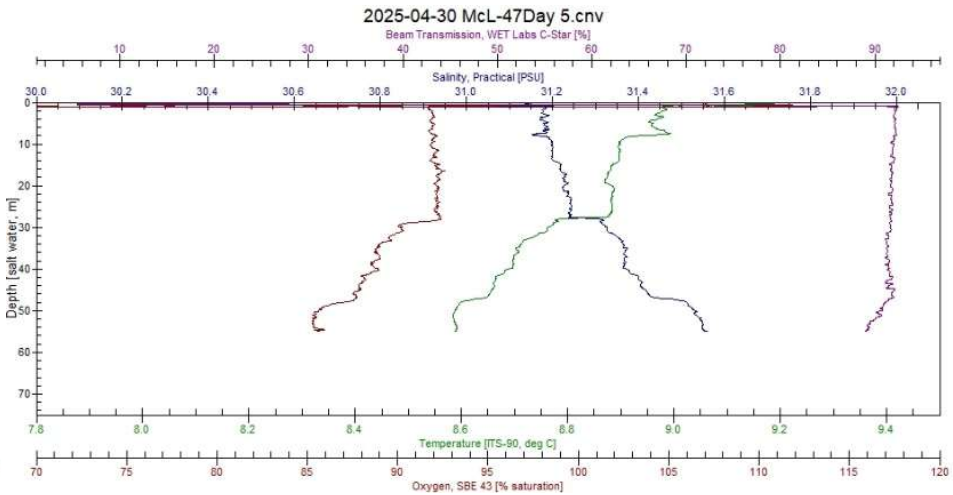

2025-04-22 McL-42Day 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

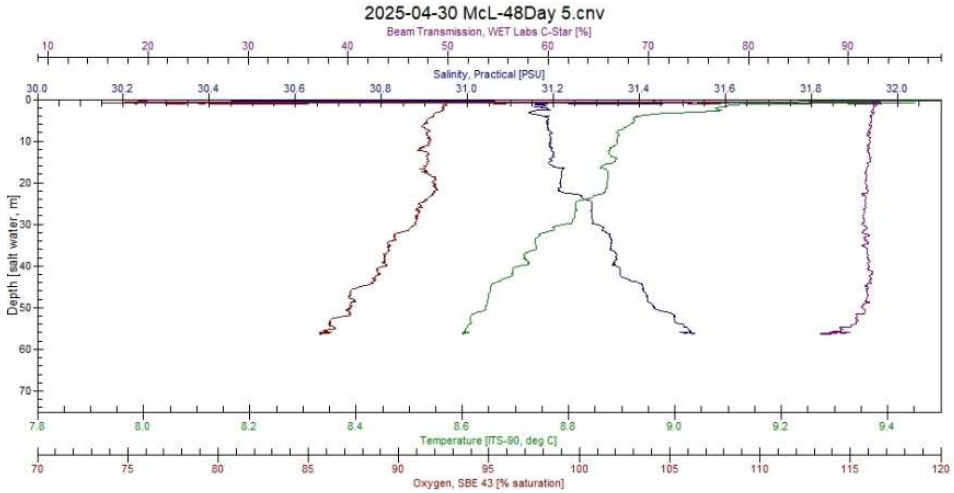

2025-04-22 PBDay 4.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

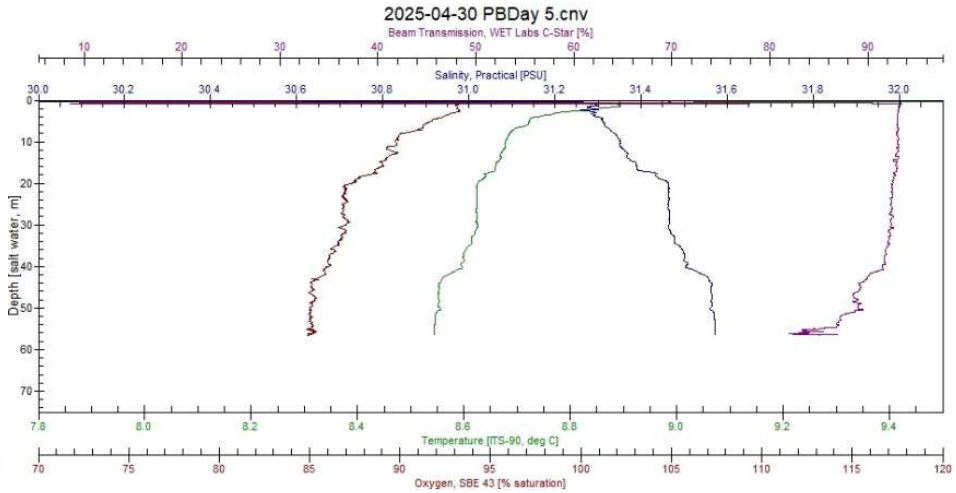

2025-04-30 CBDay 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-30 McL-45Day 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-30 McL-46Day 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-30 McL-47Day 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-30 McL-48Day 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]


2025-04-30 PBDay 5.cnv
Beam Transmission, WET Labs C-Star [%]
Salinity, Practical [PSU]
Depth [salt water, m]
Temperature [ITS-90, deg C]
Oxygen, SBE 43 [% saturation]

APPENDIX 12

Far Field Sampling Results

March 17, 2025 (Pre-bypass); ebb tide

		Bacteria (CFU/100 mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	**Depth (m)**	**Enterococci**	**Fecal Coliform**	**Human**	**Gull**	**Canada Goose**	**Dog**
Haystock Islets	1	<1	1	ND	ND	ND	ND
	30	1	2	---	---	---	---
Esquimalt Harbour	1	<1	1	220	8.4	ND	ND
	15	5	15	---	---	---	---
Ogden Point Breakwater	1	6	18	250	1.9	ND	ND
	26	4	9	---	---	---	---
Foot of Cook Street	1	<1	3	180	4.2	ND	ND
	16	3	2	---	---	---	---
Trial Island	1	1	2	6.7	ND	ND	ND
	17	<1	1	---	---	---	---
Chatham Island	1	<1	1	ND	2.1	ND	ND
	29	<1	1	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected, --- not sampled, Shaded indicates exceedance to CSSP (2022) shellfish WQG

March 31, 2025 (during bypass); ebb tide

		Bacteria (CFU/100 mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	**Depth (m)**	**Enterococci**	**Fecal Coliform**	**Human**	**Gull**	**Canada Goose**	**Dog**
Haystock Islets	1	2	3	650	48	ND	28
	27	1	7	---	---	---	---
Esquimalt Harbour	1	3	4	1,800	1.3	ND	1.8
	15	4	15	---	---	---	---
Ogden Point Breakwater	1	31	47	13,000	5.0	ND	4.2
	25	32	31	---	---	---	---
Foot of Cook Street	1	23	36	2,800	ND	ND	1.5
	16	28	43	---	---	---	---
Trial Island	1	31	39	9,400	6.2	ND	2.7
	24	58	47	---	---	---	---
Chatham Island	1	<1	4	310	3.6	ND	ND
	30	2	5	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected, --- not sampled, Shaded indicates exceedance to CSSP (2022) shellfish WQG

April 14, 2025 (during bypass); ebb tide

		Bacteria (CFU/100 mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	**Depth (m)**	**Enterococci**	**Fecal Coliform**	**Human**	**Gull**	**Canada Goose**	**Dog**
Haystock Islets	1	10	10	4,700	<0.23	<0.23	0.28
	26	16	19	---	---	---	---
Esquimalt Harbour	1	3	2	630	7.40	<0.23	0.12(J)
	14	32	39	---	---	---	---
Ogden Point Breakwater	1	9	11	8,100	35	<0.23	0.74
	27	34	50	---	---	---	---
Foot of Cook Street	1	5	6	850	<0.2	<0.24	0.12(J)
	15	7	14	---	---	---	---
Trial Island	1	8	12	4,000	84	<.26	0.33
	17	17	15	---	---	---	---
Chatham Island	1	<1	<1	18	42	<0.24	<0.24
	21	<1	3	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected, --- not sampled, Shaded indicates exceedance to CSSP (2022) shellfish WQG

April 23, 2025 (post bypass); slack tide

		Bacteria (CFU/100 mL)		Bacterial Source Tracking (gene copies/mL)			
Station name	**Depth (m)**	**Enterococci**	**Fecal Coliform**	**Human**	**Gull**	**Canada Goose**	**Dog**
Haystock Islets	1	1	4	180	24	24	24
	29	3	1	---	---	---	---
Esquimalt Harbour	1	1	<1	31	<0.25	<0.25	<0.25
	15	11	22	---	---	---	---
Ogden Point Breakwater	1	2	22	120	1.00	24	24
	26	20	32	---	---	---	---
Foot of Cook Street	1	7	9	590	<0.25	<0.25	<0.25
	15	15	32	---	---	---	---
Trial Island	1	10	28	1,400	4.60	<0.27	0.43
	22	21	36	---	---	---	---
Chatham Island	1	2	<1	24	<0.24	<0.24	<0.24
	21	3	1	---	---	---	---

(J) - Detected below practical level of quantification, ND - Not Detected, --- not sampled. Shaded indicates exceedance to CSSP (2022) shellfish WQG

APPENDIX 13 – Summary of future cleaning, maintenance and inspection activities that are anticipated to require substantive treatment work bypasses

(Items that would require a future plant bypass)

ITEM	DESCRIPTION	BYPASS REQUIREMENT	BYPASS CATEGORY	AMOUNT OF BYPASS TIME [hours]	APPROX. BYPASS VOLUME [m3]	PLAN TO CORRECT ISSUE	CORRECTION DATE	TIME TO IMPLEMENT [hours]	APPROX. BYPASS VOLUME [m3]	BYPASS CATEGORY	STOCK
PLV-11-006A	60" plug valve buried under roadway. Main influent from Macaulay & Clover.	liftstation by-pass	3	240	960,000	not possible					
PLV-11-006C	60" plug valve buried under roadway. Main influent from Macaulay & Clover.	liftstation by-pass	3	240	960,000	not possible					
PLV-11-006B	60" actuated by-pass valve	raw wastewater release during annual PM	1	1	6	not possible					
BFV-11-010	18" butterfly valve	full plant by-pass	2	12	48,000	possible	When valve fails	48	192,000	3	
PLV-12-010B	30" plug valve	full plant by-pass	3	48	192,000	not possible					
PLV-12-011B	30" plug valve	full plant by-pass	3	48	192,000	not possible					
PLV-13-010D	36" plug valve	full plant by-pass	3	120	480,000	not possible					
PLV-13-020D	36" plug valve	full plant by-pass	3	120	480,000	not possible					
PLV-13-030D	36" plug valve	full plant by-pass	3	120	480,000	not possible					
SG-14-033	5000 mm slide gate	full plant by-pass	3	72	288,000	not possible					
SG-14-011	1219 mm slide gate	full plant by-pass	3	72	288,000	not possible					
SG-14-021	1219 mm slide gate	full plant by-pass	3	72	288,000	not possible					
SG-14-031	1219 mm slide gate	full plant by-pass	3	72	288,000	not possible					
SG-14-012	1219 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-14-022	1219 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-14-032	1219 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-011	1650 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-012	1650 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-014	1963 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-021	1650 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-022	1650 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-21-024	1963 mm slide gate	secondary by-pass	2	72	288,000	not possible					
BFV-22-010H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-020H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-030H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-040H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-050H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-060H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-070H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-080H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-090H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-100H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-110H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
BFV-22-120H	24" butterfly valve	secondary by-pass	2	72	288,000	possible	Next Dirty Backwash shutdown 2030	168	672,000	3	
SG-31-011	2400 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-31-021	2400 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-31-031	2400 mm slide gate	secondary by-pass	2	72	288,000	not possible					

ITEM	DESCRIPTION	BYPASS REQUIREMENT	BYPASS CATEGORY	AMOUNT OF BYPASS TIME [hours]	APPROX. BYPASS VOLUME [m3]	PLAN TO CORRECT ISSUE	CORRECTION DATE	TIME TO IMPLEMENT [hours]	APPROX. BYPASS VOLUME [m3]	BYPASS CATEGORY	STOCK
SG-33-001	2000 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-33-011	2000 mm slide gate	secondary by-pass	2	72	288,000	not possible					
SG-32-013	1555 mm slide gate	secondary by-pass	2	72	288,000	not safe					
SG-32-014	1555 mm slide gate	secondary by-pass	2	72	288,000	not safe					
Dirty Backwash Tank		secondary by-pass	3	504	2,016,000	not possible	Every 5 years (as needed)				
MCC-63-200 Distribution & Lighting Panels	Six 600V distribution panels, six transformers, seven 120/208V lighting panels to various power, controls, and instrumentation	full plant by-pass		72	288,000	not possible	By end of 2025 (Due in 2023)				
MCC-63-300 Distribution & Lighting Panels	Three 600V & 120/208V Electrical panels to various power, controls, and instrumentation	full plant by-pass		72	288,000	not possible	By end of 2025 (Due in 2023)				
SWBD-63-100 Distribution & Lighting Panels	Three 600V distribution panels, four transformers, four 120/208V lighting panels to various power, controls, and instrumentation	secondary by-pass		60	240,000	not possible	2028				