Saanich Peninsula Treatment Plant
Environmental Monitoring Program 2021 Report

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SAANICH PENINSULA TREATMENT PLANT
ENVIRONMENTAL MONITORING PROGRAM
2021 REPORT

EXECUTIVE SUMMARY

The Capital Regional District (CRD) has been operating the Saanich Peninsula Treatment Plant (SPTP) since February 2000. The treatment plant serves North Saanich, Central Saanich and the Town of Sidney, as well as the Victoria International Airport, the Institute of Ocean Sciences and the Tseycum and Pauquachin First Nations communities. It is a conventional secondary level wastewater treatment plant, which has periodically produced Class A biosolids. The treatment plant discharges un-disinfected secondary effluent into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 metres (m) from the shoreline at a depth of 30 m. Residual solids left over from the treatment process are currently disposed of at the Hartland Landfill. The CRD undertakes monitoring to meet provincial and federal regulatory requirements, as well as to assess the impacts of the outfall on the marine environment and human health. Information is often used to inform the CRD's Regional Source Control Program (RSCP) and treatment plant operations. This monitoring is stipulated by the BC Ministry of Environment and Climate Change Strategy (ENV) through the Municipal Wastewater Regulation under the *Environmental Management Act* and the federal Wastewater Systems Effluent Regulations under the *Fisheries Act*.

Historically, the CRD developed the monitoring program in consultation with the Marine Monitoring Advisory Group (MMAG). Subsequently, the long-term monitoring program was revised in collaboration with ENV, and the regular use of the MMAG has been discontinued.

The 2021 Wastewater and Marine Environment Program consisted of the following components:

- daily, weekly and monthly analysis of wastewater for federal and provincial compliance monitoring and treatment plant performance parameters, and quarterly analysis for priority substances
- quarterly wastewater toxicity testing
- monthly analysis of biosolids for fecal coliforms and metals
- a twice-yearly surface monitoring program, consisting of five sampling days within a 30-day period, once each in summer and winter

All Saanich Peninsula Wastewater Monitoring components were in compliance in 2021.

WASTEWATER MONITORING

Compliance Monitoring and Treatment Plant Performance

The CRD conducted wastewater monitoring on a regular basis to profile the chemical and physical constituents of influent and effluent, determine concentrations relative to provincial and federal regulatory limits, and assess treatment plant performance. Parameters monitored for regulatory compliance were all below the applicable effluent regulatory limits, with the exception of one total suspended solids result on May 18th, which exceeded the regulatory limit. Influent and effluent quality was within expected ranges and met all treatment plant operating objectives.

Priority Substances

In addition to the compliance and treatment plant performance monitoring, over 600 substances were analyzed in the SPTP influent and effluent on a quarterly basis. These substances were monitored to more comprehensively assess potential risks of the wastewater discharge to organisms living in the marine environment around the outfall.

Approximately 46% of substances were detected in 50% or more of the samples, and included most of the conventional variables, metals (both total and dissolved), some organics, and high-resolution parameters. Most frequently detected substances were below BC and Canadian Water Quality Guidelines (WQG), even in undiluted effluent. Only enterococci, nitrogen, weak acid dissociable cyanide, cadmium, copper, lead zinc, high-resolution total polychlorinated biphenyls, and high-resolution 4-nonylphenol monoethoxylates exceeded guidelines in undiluted effluent, prior to discharge to the marine receiving environment. Average pH was slightly below WQG.

Water quality guidelines must be met outside of the initial dilution zone (IDZ) (an area with a radius of approximately 100 m around the outfall). In order to predict levels at the edge of the IDZ, estimated minimum initial dilution factors were applied to all substance concentrations. All substances were predicted to be below WQG after the application of this dilution factor, including those substances that were above guidelines in undiluted effluent, with the exception of enterococci. As such, impacts of these discharged substances to aquatic life are likely minimal. Surface water monitoring was undertaken to assess the human health and shellfish impacts of the effluent bacteriological exceedances (see Surface Water Monitoring section below).

Toxicity Testing

In 2021, all toxicity tests passed with no mortality and no impacts on survival or reproductive endpoints.

Disinfection

When the SPTP was commissioned in 2001, a technical advisory group determined that disinfection to reduce effluent bacteriological levels was unnecessary to meet water quality guidelines for primary contact (e.g. recreation). The advisory group confirmed this recommendation in 2015. In 2020, after consultation with W̱SÁNEĆ First Nations and other stakeholders, staff again recommended that disinfection not be installed.

Biosolids Monitoring

No biosolids were produced at the SPTP in 2021. All sludge generated at the facility was disposed of at the Hartland Landfill. The CRD monitored the sludge in 2021 to inform the CRD's Regional Source Control Program (RSCP), and all regulated parameters were below Class A biosolids limits.

Surface Water Monitoring

Bacteriology

Surface water (1 m depth) fecal coliform and enterococci concentrations were low at all stations, with geometric means of 1 CFU/100 mL or less. IDZ stations also had low bacteriology concentrations, with geometric means of 15 CFU/100 mL or less, below BC and Health Canada recreational and shellfish guidelines. There were no elevated geometric mean fecal coliform or enterococci concentrations observed at any station, on any sampling date, and no samples that exceeded the Health Canada enterococci single sample guideline of 70 CFU/100 mL.

Overall, results indicate that adverse health effects from recreational primary contact activities and shellfish harvesting are not expected. However, an area of approximately 17.65 km^2 around the outfall is closed for shellfish harvesting, as a standard Fisheries and Oceans Canada procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall of 300 m, but closure areas are usually larger near bigger urban centres, such as for the SPTP outfall, where there are other potential sources of bacterial contamination (e.g., stormwater discharges, marinas, septic systems, sewage pumps), in addition to the wastewater outfall.

Extended Monitoring

WQG exceedances were observed for boron in the water column surrounding the SPTP outfall at all stations and sampling events, including at the reference station. These exceedances are expected, as boron is naturally occurring in the environment at higher levels. The CRD will continue to monitor metals in waters around the outfall and the reference station to assess environmental significance.

Nutrients

Nutrient content in receiving water is analyzed to provide a qualitative comparison between outfall and reference stations. There were some seasonal patterns in the nutrient results, which were consistent between the reference and the IDZ stations. Results were within the ranges measured in previous years and those of the pre- and post-discharge assessment programs. As was observed in previous monitoring years, high variability, both spatially and temporally, was evident in the data. Fluctuations in nutrient concentrations are attributed to natural variation in the monitoring areas, rather than to an effect from the SPTP discharge.

SEAFLOOR MONITORING

Seafloor monitoring (i.e., benthic community structure and sediment chemistry) was conducted in 2020. This component is conducted every four years, since before the plant commenced discharging in 2000. The next sampling event is planned for 2024.

OVERALL ASSESSMENT

Based on tests used to monitor effluent quality and surface water in 2021, all components of the Saanich Peninsula Wastewater Treatment Plant were in compliance. Results were similar to previous years. Influent and effluent quality was within expected ranges and met regulatory limits and operating certificate compliance requirements on all sampling dates. All substances, with the exception of bacterial indicators, for which there are BC or Canadian WQG, met these guidelines when the estimated minimum initial environmental dilution of the effluent was factored in, indicating that the predicted levels of substances in the environment were not likely to be at concentrations of concern to aquatic life. Surface water fecal coliform and enterococci data confirmed that the discharge to the receiving environment was in compliance and therefore, considered no or low-risk for recreational activities and shellfish consumers. As expected, boron exceeded WQG at every station and sampling depth, including at the reference station, as the natural concentrations of boron are above WQG in the Salish Sea. ENV is working on updating the boron guideline. Surface water nutrient concentrations were within ranges measured in previous monitoring programs and showed no detectable effect from the discharge.

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Terms & Abbreviations

ALK	alkalinity
AVS	Acid Volatile Sulphide
BC OMRR	Organic Matter Recycling Regulations
BOD	Biochemical Oxygen Demand
CALA	Canadian Association for Laboratory Accreditation
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
CSSP	Canadian Shellfish Sanitation Program
ENT	Enterococci
ENV	BC Ministry of Environment and Climate Change Strategy
FC	Fecal Coliform
IDZ	Initial Dilution Zone
LWMP	Liquid Waste Management Program
MMAG	Marine Monitoring Advisory Group
NH_3	Ammonia
NO_2	nitrite
NO_3	nitrate
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDBE	Polybrominated diphenyl ethers
PFOS	Perfluorooctanesulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFNA	Perfluorononanoic acid
PFoSA	Perfluorooctanesulfonamide
PFOA	Perfluorooctanoic acid
PFPeA	Perfluoropentanoic acid
PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PPCP	Pharmaceuticals and personal care products
Q+	Quarterly Plus
QA/QC	quality assessment/quality control
RSCP	Regional Source Control Program
SCADA	Supervisory Control and Data Acquisition
SPTP	Saanich Peninsula Treatment Plant
SQG	sediment quality guidelines
TDP	total dissolved phosphorus
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TP	total phosphorus
TSS	Total Suspended Solids
TWQRP	Technical Water Quality Review Panel
US EPA	US Environmental Protection Agency
WAD	weak acid dissociable (WAD) cyanide
WMEP	Wastewater Marine Environment Program
WQG	Water Quality Guidelines
WSER	Wastewater Systems Effluent Regulations

SAANICH PENINSULA TREATMENT PLANT ENVIRONMENTAL MONITORING PROGRAM 2021 REPORT

1.0 BACKGROUND

The Saanich Peninsula Treatment Plant (SPTP) started operations in February 2000. This Capital Regional District (CRD) treatment plant serves North Saanich, Central Saanich and the Town of Sidney, as well as the Victoria International Airport, the Institute of Ocean Sciences and Tseycum and Pauquachin First Nations communities. It is a conventional secondary level wastewater treatment plant, which has periodically produced Class A biosolids. The treatment facility discharges undisinfected secondary-treated effluent into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 m from the shoreline at a depth of 30 m. Residual sludge from the treatment process is currently disposed of at the Hartland Landfill. The Wastewater and Marine Environment Program (WMEP) includes regular monitoring, as stipulated by the BC Ministry of Environment and Climate Change Strategy (ENV), through the Municipal Wastewater Regulation under the *Environmental Management Act* and the federal Wastewater Systems Effluent Regulations (WSER) under the *Fisheries Act*. The facility operates under a Provincial Operational Certificate (#ME-15445), and the Saanich Peninsula Liquid Waste Management Plan (LWMP) (CRD, 2009a).

The Saanich Peninsula LWMP committed the CRD to carry out a pre- and post-discharge assessment program and to develop a long-term monitoring program. The pre-discharge program was conducted from October 1998 to January 2000. The post-discharge program was initiated in February 2000 (when treatment plant operation began) and completed in February 2001. The results presented in Aquametrix Research Ltd. (2000, 2001a and 2001b) guided the development of the long-term monitoring program in consultation with the Marine Monitoring Advisory Group (MMAG). The MMAG consists of university and government scientists with expertise in the fields of marine biology, chemistry, toxicology, oceanography and public health. This independent group historically reviewed CRD marine monitoring and assessment programs and made recommendations.

Subsequently, the long-term monitoring program was revised in collaboration with ENV, and the regular use of the MMAG discontinued. This revised program was implemented in January 2013 and is summarized in Table 2.1.

In addition, the initial technical water quality review panel (TWQRP) suggested a number of conditions that would prompt a reevaluation of the need for disinfection at the SPTP, one of which was 10 years of plant operation. This reevaluation was initiated in 2011 with the MMAG receiving formal delegation to undertake the review. In 2015, the MMAG confirmed that disinfection continues to be unnecessary to meet recreational water quality guidelines around the outfall, and requested that the CRD continue to assess the potential benefits of disinfection to nearby shellfish resources in consultation with First Nation and other shellfish stakeholders. In January 2020, staff advised the Saanich Peninsula Wastewater Commission that installation of disinfection at the SPTP does not appear to present any significant benefit to nearby shellfish resources, as the ongoing surface water bacteriological monitoring indicates that levels around the outfall are well below thresholds to protect shellfish harvesting. Staff therefore recommend that disinfection not be installed at this time. Staff continue to meet with W̱SÁNEĆ First Nations and other shellfish stakeholders to assess potential future disinfection need, as well as to identify other areas on the Saanich Peninsula where shellfish harvesting could be restored but are outside the influence of the SPTP.

2.0 INTRODUCTION

The objectives of the SPTP WMEP are to:

- Comply with federal and provincial wastewater regulations.
- Assess the effects of the wastewater discharge on the marine environment and the potential for human health risks (related to the presence of bacteria in surface water).

- Determine waste loads to the marine receiving environment.
- Monitor influent, effluent and sludge quality (both as part of regulatory requirements and to optimize treatment plant performance).
- Supply information to the CRD's Regional Source Control Program (RSCP) and treatment plant operators.
- Provide scientific guidance to wastewater managers regarding the use of the marine environment for the disposal of municipal wastewater.

This report presents the results of the 2021 SPTP WMEP in one integrated report. The components of the current WMEP are presented in Table 2.1. These components, the parameters that are measured for each, and the sampling frequency were determined based on regulatory requirements (i.e., for compliance monitoring), a review of the pre- and post-discharge assessment programs, similar monitoring and assessment programs, and recommendations of the MMAG. The following sections present summaries of the methods used for sample collection and processing, and for data analysis of each component of the 2021 WMEP. Detailed information can be found in any technical reports and independent consultant reports referred to in the individual sections. Methods were selected for each of these components, based on internationally recognized standards, and sampling and analytical protocols.

Outfall and reference stations for the sea surface and seafloor components of the WMEP were chosen by the MMAG, following recommendations by the consultant (Aquametrix) that conducted the pre- and post-discharge monitoring program. The reference station was chosen because oceanographic computer modelling indicated it would be far enough away from the plume effects, while being at a similar depth to the outfall stations.

Table 2.1 SPTP Wastewater and Marine Environment Program Components, Parameters, Frequency and Stations

Component	Parameter	Frequency and Stations
Wastewater Monitoring	compliance monitoring (CBOD, FC, flow, unionized NH_3, pH @ 15°C, TSS)[1]	daily to twice per month at the influent and final effluent sampling points[2] federal – every two weeks provincial – monthly
	treatment plant performance (ALK, CBOD, COD, COND, Cl, NH_3, NO_2, NO_3, BOD, TDP, TKN, TP, TSS)[1]	twice per week to monthly[3] at the influent and final effluent sampling points
	influent and effluent priority substances[4]	quarterly[5] at the influent and effluent sampling points
	chronic toxicity testing	annually at the effluent sampling point (*Ceriodaphnia dubia* survival and reproduction, Rainbow trout embryo-alevin survival and development, echinoderm (*Strongylocentrotus)* fertilization, seven-day Pacific topsmelt survival and growth)
	acute toxicity testing	quarterly at the effluent sampling point (Rainbow trout 96-hour LC50, *Daphnia magna* 48-hour LC50)
Sludge Monitoring	metals, moisture, FC[1]	monitored monthly for informational purposes
Surface Water Monitoring	indicator bacteria (FC, ENT)[1]	10 times a year (5-in-30 samples collected in the winter and in the summer) at 19 stations (14 outfall stations, four IDZ stations and one reference station)
	nutrients (NH_3, NO_2, NO_3, TDP, TKN, TP), COND, salinity, pH, temperature and TOC[1]	10 times a year (5-in-30 samples collected in the winter and in the summer) at five stations (four IDZ stations and one reference station)
	metals	twice yearly (winter and summer) at five stations (four IDZ stations and one reference station)
Seafloor	particle size analysis, TOC[1], AVS[1] and sediment chemistry[4]	every four years at two stations[6] (one outfall terminus station and one reference station)
	benthic community structure (including TA, TR, SDI)[7]	

Notes:

[1] ALK - alkalinity, AVS - acid volatile sulphide, CBOD - carbonaceous biochemical oxygen demand, COD - chemical oxygen demand, COND - conductivity, Cl - chloride, FC - fecal coliforms, ENT - enterococci, NH3 - ammonia, NO_3- nitrate, NO_2 -nitrite, BOD - biochemical oxygen demand, TDP - total dissolved phosphorus, TKN - total Kjeldahl nitrogen, TOC - total organic carbon, TP - total phosphorus, TSS - total suspended solids

[2] Frequency is listed in Appendix A

[3] Frequency depends on the operation of the facility and what the operators need to optimize treatment plant performance

[4] All parameters are listed in Appendix A

[5] January and July additional Q+ sampling conducted one day before and one day after the quarterly sampling event

[6] Conducted in 2020. Next time will be 2024, 2028, etc.

[7] TA - total abundance, TR - taxa richness, SDI - Swartz Dominance index

3.0 WASTEWATER MONITORING

3.1 Introduction

The CRD conducts wastewater monitoring on a regular basis at the SPTP to assess compliance with the operational certificate under the LWMP and the federal WSER, to assess treatment plant performance and to profile the physical and chemical constituents of treated wastewater before it is released to the marine receiving environment. These data provide an indication of which components may be of concern in the receiving environment and can be used to direct the efforts of the WMEP and the RSCP.

Wastewater monitoring at the SPTP consists of quarterly composite analyses for all priority substances, supplemented by additional “quarterly plus” (Q+) composite sampling occurring one day before and one day after the quarterly sampling events in January and July. The Q+ monitoring program is intended to increase the precision of the quarterly sampling events for key substances of interest (Appendix A).

The list of priority substances was adapted from the US Environmental Protection Agency (US EPA) National Recommended Water Quality Criteria; Priority Toxic Pollutants list (US EPA, 2002). The CRD reviews its list on a periodic basis to determine the need to delete or add substances depending on new developments in terms of analytical techniques, potential presence in wastewaters and potential effects on human health and the receiving environment, alignment with the Vancouver Aquarium’s Pollution Tracker parameters, and upon ENV review. Influent is analyzed for a subset list of substances (Appendix A).

Detailed statistical trend analyses are undertaken every three to five years to quantitatively assess temporal trends in concentrations and loadings of wastewater parameters. In 2012, Golder Associates (Golder, 2013) updated the previous trend assessment to include the 2009-2011 results, expanding the total SPTP dataset from 2000-2011. Results of this assessment were presented in the 2011 annual report (CRD, 2012). The most recent trend assessment was completed in 2017 (Golder, 2019) and included the next three years of wastewater data (2012-2015). Results were included in the 2016 annual report (CRD, 2017). The next trend assessment for the SPTP is planned for the next one to two years.

3.2 Methods

Information on wastewater sampling and analytical methods is presented below and in any independent consultants’ reports referenced in the individual sections. Sampling and analytical methods used for each of these components were based on recognized standards and protocols (APHA, 1992; BC MWLAP, 2003). Samples were either collected as composites (i.e., over a 24-hour period) or individual grabs (i.e., discrete one-time) depending on the parameters that were being analyzed.

3.2.1 Compliance Monitoring and Treatment Plant Performance

The CRD operators and sampling technicians regularly monitor effluent quality and flow, as required by the ENV operational certificate under the SPTP LWMP and federal regulations. Table 3.1 presents parameters, effluent regulatory limits, frequency and sampling methods used to assess compliance.

Influent and effluent samples were also collected periodically to assess the efficiency of the treatment plant processes (see Table 2.1 for a list of parameters and monitoring frequency). Flow was measured continuously with a Supervisory Control and Data Acquisition (SCADA) system.

Operators and technicians collected composite influent and effluent samples using on-site automated ISCO™ samplers (http://www.isco.com). Influent samples were collected from a sampling point situated where the wastewater had entered the treatment plant and been screened to <6mm, but prior to transfer to the settling tanks (i.e., before primary treatment). Effluent samples were collected from a sampling port situated where the final effluent is discharged to the marine receiving environment. Sub-samples (consisting of 400 mL) were collected every 30 minutes and composited into one sample representing the 24-hour period. Grab samples (i.e., one-time discrete samples) were collected for the analysis of parameters not suited to composite sampling, such as fecal coliforms, pH, oil and grease, and volatile organic compounds. Laboratory analyses including parameters required by WSER were conducted at Bureau Veritas Laboratories Inc. (Burnaby, BC) a Canadian Association for Laboratory Accreditation (CALA) certified lab.

SGS AXYS Analytical Services (Sidney, BC) was engaged for high-resolution analysis.

Table 3.1 SPTP Effluent Compliance Monitoring Parameters, Regulatory Limits, Frequency and Sampling Methods

Parameter	Effluent Regulatory Limit	Required Frequency of Monitoring[4]	Sampling Method
CBOD	provincial – 45 mg/L maximum federal – 25 mg/L average	provincial – 2x per week federal – 2x per month	24-hr composite
TSS[1]	provincial – 45 mg/L maximum federal – 25 mg/L average	provincial – 2x per week federal – 2x per month	24-hr composite
flow[1]	24,188 m^3/day (average daily)[2] 56,000 m^3/day (maximum daily)	continuously	SCADA[3]
pH[1]	6-9	2x per week	grab
unionized ammonia[1], pH @ 15°C	provincial – required, but no limit federal –1.25 mg/L maximum	provincial – monthly federal – 2x per month	24-hr composite
fecal coliforms	required, but no limit	provincial – monthly	grab
total residual chlorine	federal – 0.02 mg/L average	only when used as part of the treatment process[5]	grab

Notes:
[1] Parameters which are also analyzed in influent
[2] Limit determined on an annual basis = [12,200 m^3/d * (1.0316 $^{\text{calendar year—1999}}$)]
[3] SCADA system
[4] As described in the operating certificate or the federal WSER
[5] Chlorine was not used as part of the SPTP treatment process in 2021. As such, total residual chlorine was not monitored.

CBOD = carbonaceous biochemical oxygen demand; TSS = total suspended solids; FC = fecal coliforms

3.2.2 Priority Substances

CRD technicians collected influent and effluent samples, using methods similar to those used for compliance parameters, but with the following adaptations:

- Sampling equipment (i.e., hoses, sieves and carboys) was cleaned thoroughly prior to use by an external private laboratory (SGS AXYS Analytical Services), following trace cleaning procedures, including triple rinses with solvents, acids and distilled water.
- The CRD WMEP automated ISCO™ samplers (different from the on-site SPTP automated ISCO™ samplers used by the operators for the compliance and treatment plant performance monitoring) were used to collect influent and effluent composite samples. Two different samplers were used: one for influent and one for effluent. Sub-samples (consisting of 400 mL) were collected every 30 minutes and composited into one sample representing the 24-hour period.
- Composite samples were collected into a fluorinated, pre-cleaned 20-L carboy and continuously and thoroughly mixed before and during sample splitting to ensure sample homogeneity.

- Grab samples were collected using the ISCO™ sampler manual pumping setting (i.e., at the end of each composite sample interval) and transferred into appropriate sample bottles on site.

Sampling technicians immediately dispatched the samples to qualified laboratories (i.e., certified by the Canadian Association for Laboratory Accreditation) to conduct chemical analyses. Bureau Veritas (Burnaby, BC) conducted analyses for conventional parameters including federally regulated parameters (i.e., pH @ 15°C, unionized ammonia, TSS, CBOD) and priority substances; and SGS AXYS Analytical Services conducted analyses for high-resolution parameters. Laboratory and CRD staff chose analytical methods to ensure that method detection limits were low enough for comparisons to ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG and the Canadian Council of Ministers of the Environment (CCME 2003) *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

Wastewater was analyzed for a comprehensive list of priority substances that included conventional variables (included for the assessment of potential effects on the marine receiving environment and for comparison to the compliance treatment plant performance results), metals, halogenated compounds, polycyclic aromatic hydrocarbons, polybrominated diphenyl ethers, polychlorinated biphenyls, pesticides, pharmaceuticals and personal care products, nonylphenols and fluorinated compounds (Appendix A).

DATA QUALITY ASSESSMENT

The CRD and laboratory staff followed rigorous quality assessment/quality control (QA/QC) procedures for both field sampling and laboratory analyses. Within each batch that was analyzed quarterly (i.e., four batches in 2021 that included samples from McLoughlin Point WWTP), one sample was randomly chosen for laboratory triplicate analysis, one sample was randomly chosen for field triplicate analysis, and one sample for a matrix spike. Both Bureau Veritas and SGS AXYS Analytical also conducted internal QA/QC analysis, including method analyte spikes, method blanks and standard reference materials.

DATA ANALYSIS

Percent frequencies of detection were determined for each substance by adding the number of times the compound was detected, dividing it by the total number of samples collected in the year and multiplying it by 100. A frequency of greater than 50% was selected as a percentage above which meaningful statistical analyses could be conducted. For non-detectable results (i.e., less than the method detection limits), a value of half the method detection limit was used for calculating the substance mean concentrations. For those substances detected greater than 50% of the time in the effluent, predictions of substance concentrations in the receiving environment were made by dividing maximum substance concentrations in effluent by the estimated minimum initial dilution factor of 153:1 (Hayco, 2005). This estimated minimum initial dilution factor was determined by a receiving environment dye study undertaken December 7-9, 2004, and was determined to occur within approximately 50 m south of the outfall at a depth of 24.4 m at slack tide (Hayco 2005). Predicted environmental concentrations, as well as the original sample concentrations (i.e., without the initial dilution factor), were compared to:

- ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG,
- CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 2003), and
- Health Canada guidelines for the protection of human health (Health Canada, 2012).

These comparisons give an indication of the potential for receiving environment effects.

Annual loadings were determined by first calculating the quarterly loadings (January, April, July and October), averaging these values and multiplying by the number of days in the year. Quarterly loadings were calculated by averaging the total flow over the two sampling days and multiplying the average flow by the concentration of each substance measured that quarter. Loadings were calculated only for substances detected in >50% of sampling events.

Substances for which minimum initial dilution and loading calculations were not appropriate were noted as n/a (not applicable). For example, pH, conductivity and hardness do not lend themselves to loading calculations (e.g., pH is a discrete measurement and calculating a loading over time is not appropriate).

3.2.3 Toxicity Testing

Acute toxicity testing refers to the assessment of adverse effects of a substance resulting from either a single exposure or from multiple exposures to a substance in a short period of time (usually less than 24 hours). Acute toxicity testing was conducted by Nautilus Environmental (Burnaby, BC) on a quarterly basis using effluent collected from the SPTP in January, April, July and October. Tests consisted of a 96-hour Rainbow trout LC50 and a 48-hour *Daphnia magna* LC50. The LC50 test measures the lethal concentration that kills 50% of organisms over the test period. Anything less than 100% v/v is a fail.

Chronic toxicity testing refers to the assessment of adverse health effects from repeated exposures, often at lower levels, to a substance over a longer period of time (weeks or years). Chronic toxicity results are reported as either the LC50, which is the concentration at which 50% of the test organisms die during the test period, or as the EC50 or EC25, which are the concentrations at which a negative impact is observed on 50% or 25%, respectively, of the organisms in the specified test period (e.g., decreased fertilization or growth). Chronic toxicity testing was conducted by Nautilus using effluent collected from the SPTP in November and December. Tests consisted of a seven-day *Oncorhynchus mykiss* (Rainbow trout) embryo-alevin, a seven-day *Atherinops affinis* (Topsmelt) survival and growth, a six-day *Ceriodaphnia* survival and reproduction, and an echinoid fertilization test.

3.3 Results and Discussion

3.3.1 Compliance Monitoring and Treatment Plant Performance

Flow data are presented in Appendix B1. Flow measurements indicate that the mean daily flow in 2021 was slightly higher than that in 2020 (10,073 m^3/d in 2021 versus 9,993 m^3/d in 2020). There were no exceedances of the permitted average or maximum daily allowable flow in 2021. Figure 3.1 presents the SPTP flows from 2011-2021 indicating that flows are not increasing significantly over time. Provincial wastewater compliance monitoring and treatment plant performance monitoring results are summarized in Table 3.2. Federal wastewater compliance parameters are summarized in Table 3.3. The complete raw data sets are presented in Appendices B2 (influent) and B3 (effluent).

In 2021, there was one TSS result of 81 mg/L, which exceeds the permitted maximum of 45 mg/L. Observationally, there appeared to be algae present in the sample, which is the likely cause of the elevated value. All other effluent results were below provincial and federal regulatory limits.

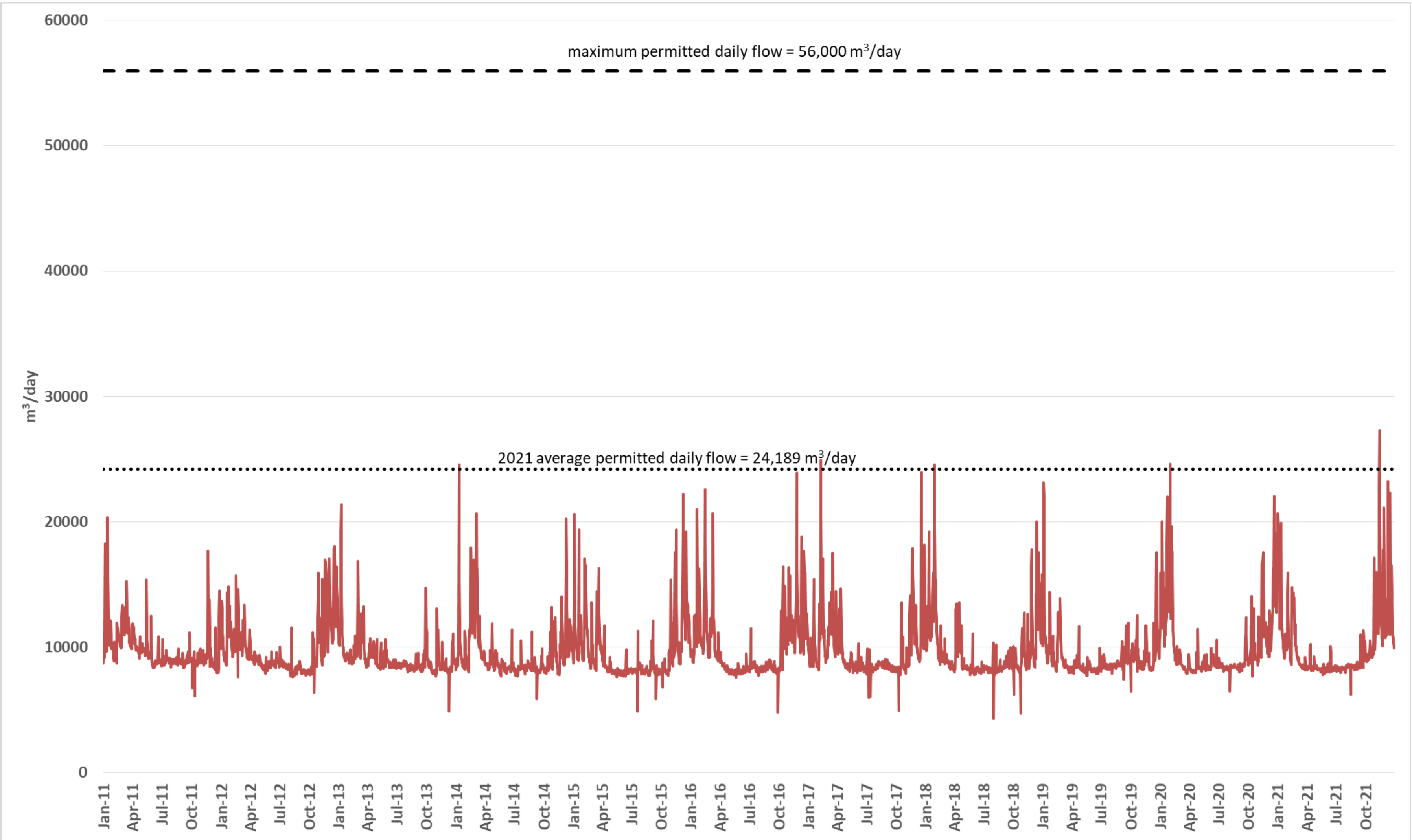


Figure 3.1 SPWTP Effluent flows from 2011-2021

Table 3.2 SPTP 2021 Provincial Compliance Monitoring and Treatment Plant Performance Results

Parameter and Unit	Effluent Regulatory Limit	Influent				Effluent			
		n	Mean	Min	Max	*n*	Mean	Min	Max
CBOD (mg/L)	45 maximum	4	245	210	270	129	5	<1	16
TSS (mg/L)	45 maximum	4	235	140	310	30	14	<1	81
flow (m^3/d)	24,188 average daily 56,000 maximum daily	---	---	---	---	365	10,073	6,198	27,289
pH (pH units)	6-9	32	7.35	7.06	7.84	34	7.0	6.4	7.5
NH_3 (mg/L N)	required, but no limit	32	34.6	8	48	34	2.7	0.025	8.5
fecal coliform (CFU/100 mL)	required, but no limit	8	5,375,000	1900000	8,800,000	34	83,938	4,400	460,000
alkalinity (mg/L)	*	12	189	101	245	12	36	10.7	58
chloride (mg/L)	*	16	73.6	30	100	18	69	19	92
COD (mg/L)	*	56	575	247	847	58	62	<20	295
BOD (mg/L)	*	54	228	83	335	104	17	4.3	47.1
conductivity (µS/cm)	*	28	693	329	890	30	493	247	607
nitrate (mg/L N)	*	28	0.19	0.01	2.3	30	13.09	5.62	18.1
nitrite (mg/L N)	*	32	0.03	0.001	0.218	34	2.02	<0.05	6.4
TKN (mg/L N)	*	28	43.1	14.3	63.1	30	3.7	<0.02	11.8
TDP (mg/L P)	*	8	4393	3420	5200	10	2,811	1,840	3,730
TP (mg/L P)	*	20	5.9	2.8	9.4	22	3	1.2	7.54

Notes:

CBOD = carbonaceous biochemical oxygen demand, COD = chemical oxygen demand, FC = fecal coliforms, NH_3 = ammonia, BOD = biochemical oxygen demand, TDP = total dissolved phosphorus, TKN = total Kjeldahl nitrogen, TP = total phosphorus, TSS = total suspended solids

Average daily flows limit determined on an annual basis = [12,200 m^3/d * ($1.0316^{\text{calendar year -1999}}$)]

* Measured to assess treatment plant performance

Shaded value indicates exceedance to permitted maximum

Table 3.3 Saanich Peninsula Treatment Plant Federal Wastewater Compliance Results 2021

Saanich Peninsula Treatment Plant Secondary Effluent				
	CBOD (mg/L)	Unionized ammonia (mg/L N)	pH @ 15°C	TSS (mg/L)
Federal Limit	**25 average**	**1.25 max**	**---**	**25 average**
	***n*=126**	***n*=27**	***n*=27**	***n*=27**
January	3.3	0.0003	6.6	4.9
February	4.3	0.0003	6.5	7.2
March	8.6	0.0003	6.2	11.4
April	8.5	0.003	6.5	12.8
May	5.9	0.004	6.8	43.3
June	7.1	0.002	6.8	21.5
July	4.9	0.02	6.9	14.7
August	4.8	0.02	7.1	15.0
September	4.4	0.02	7.0	17.5
October	4.3	0.002	6.7	5.6
November	3.4	0.002	6.7	22.5
December	3.5	0.0003	6.5	6.0

3.3.2 Priority Substances

Over 600 priority substances were analyzed in the SPTP influent and effluent, including high-resolution substances on a quarterly basis. Approximately 46% of these were detected in effluent in at least 50% of the samples and are listed in Table 3.4. These include most of the conventional variables (TSS, BOD, CBOD, nutrients, etc.), metals (total and dissolved), some organics and high-resolution parameters.

Influent and effluent concentrations for all priority substances detected are presented in Appendix B4. Table 3.4 presents annual mean, minimum and maximum effluent concentrations, and loadings of the substances detected in 50% or more of sampling events. The 1:153 estimated minimum initial dilution factor (Hayco, 2005) was applied to the maximum concentrations and the resulting concentrations were then compared to the ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG, the CCME *Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 2003), and the Health Canada *Guidelines for Canadian Recreational Water Quality* (Health Canada, 2012) to assess predicted environmental concentrations. It should be noted that not all substances (e.g., alkalinity, conductivity, hardness and pH) discharged to the marine receiving environment could be assessed by extrapolating effluent concentrations using predicted minimum initial dilution. These parameters are not suitable for effluent dilution calculations (e.g., pH of 7.0 cannot be divided by estimated minimum initial dilution of 1:153).

The maximum concentrations of most parameters were below guidelines in undiluted effluent (i.e., prior to discharge). Parameters not meeting WQG in undiluted effluent (maximum concentrations) included: enterococci, nitrogen, weak acid dissociable (WAD) cyanide, cadmium, copper, lead, zinc, total polychlorinated biphenyls (high-res), and 4-nonylphenol monoethoxylates (high-res) (Table 3.4); these exceedances have also been observed in previous years. pH average concentration was also slightly below the WQG (7.96 average, with WQG range of 7.0-8.7). All results were below WQG after application of the estimated minimum initial dilution factor (i.e., the maximum predicted concentration in the environment), with the exception of enterococci. Effluent concentrations have consistently been below WQG from 2000-2021, after estimated minimum initial dilution has been applied (CRD, 2002-2020). However, in some previous years, estimated environmental concentrations were predicted using mean effluent concentrations, rather than maximum concentrations, as has been done since 2010. CRD staff will continue to monitor effluent to determine whether exceedances of BC WQG are changing in frequency over time.

3.3.3 Toxicity Testing

Table 3.5 presents the results from the 2021 acute toxicity testing. There was no mortality observed for either acute toxicity test (Rainbow trout or *Daphnia*) in any of the samples (January, April, July and October). Table 3.6 presents the results from the 2021 chronic toxicity testing indicating no impact to organisms when exposed to 100% effluent.

3.4 Overall Assessment

Overall, the 2021 wastewater monitoring results were generally consistent with previous years. The SPTP effluent had one exceedance to permitted TSS requirements, and met all other flow, CBOD and unionized ammonia requirements stipulated under the provincial operational certificate and federal WSER, indicating that wastewaters, from an operational perspective, were as expected. In addition, because all priority substances met applicable WQG in the marine receiving environment (following the application of estimated minimum initial dilution factors), with the exception of bacteriological indicators, it is not likely that significant effects on aquatic life will occur as a result of the substances being discharged. The use of an estimated minimum initial dilution factor allows for a conservative (i.e., protective) estimate of potential effects because the predicted average initial factors are actually much higher in the marine receiving environments around the outfall (Hayco, 2005). Direct risk to human health and shellfish harvesting, as a result of the bacteriological indicator exceedances in effluent, was assessed via surface water and water column monitoring in the receiving environment (see Section 5.0).

Table 3.4 Annual Concentrations and Loadings of Frequently Detected Substances (≥50% of the time) in SPTP Effluent, 2021

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Conventionals										
Enterococci	CFU/100 mL	1	100	19,940	52,000	2,200	340	---	---	35d, 70d
Fecal Coliforms	CFU/100 mL	1	100	94,200	200,000	10,000	1,307	---	---	
Alkalinity - Total - pH 4.5	mg/L	1	100	40.33	61.0	25.0	n/a	---	---	
Chloride	mg/L	1	100	66.50	88.0	58.0	0.575	221,581	222	
Total/SAD Cyanide	mg/L	0.0005	100	0.002	0.003	0.001	0.00002	6.95	0.007	
WAD Cyanide	mg/L	0.0005	100	0.001	0.003	0.001	0.00002	3.89	0.004	0.001a
Alkalinity - Bicarbonate	mg/L	1	100	49.00	75.0	30.0	n/a	180,261	180	
Hardness (as CaCO3)	mg/L	0.5	100	72.16	80.6	63.2	n/a	---	---	
Hardness (as CaCO3)	mg/L	0.5	100	73.95	86.9	64.1	n/a	---	---	
Sulphate	mg/L	1	100	28.83	33.0	27.0	0.216	95,341	95	
N - NH3 (As N)	mg/L	0.015	100	3.84	7.40	0.03	0.048	10,697	10.7	19.7
N - NO2 (As N)	mg/L	0.05	100	1.51	3.11	0.03	0.020	13,688	13.7	
N - NO3 (As N)	mg/L	0.2	100	12.73	14.0	12.1	0.092	35,626	35.6	3.7a
N - NO3 + No2 (As N)	mg/L	0.2	100	14.95	15.4	14.0	0.101	48,895	48.9	
N - TKN (As N)	mg/L	0.2	100	3.44	5.48	0.28	0.036	9,490	9.5	
N - Total (As N)	mg/L	0.2	100	18.43	19.9	14.3	0.130	58,111	58.1	
P - PO4 - Ortho (As P)	mg/L	0.03	100	2.45	2.80	1.70	0.018	7,582	7.6	
P – PO4 - Total (As P)	µg/L	5	100	3,510	7,540	1,840	49.281	10,452	10.5	
Total Organic Carbon	mg/L	10	100	11.47	14.0	9.80	0.092	38,227	38.2	
Biochemical Oxygen Demand	mg/L	2	100	25.05	36.0	7.30	0.235	---	---	
Carbonaceous Biochemical Oxygen Demand	mg/L	2	100	8.18	13.0	2.60	0.085	---	---	
Chemical Oxygen Demand	mg/L	10	100	58.17	76.0	34.0	0.497	---	---	
pH	pH	0.1	100	6.96	7.18	6.74	n/a	---	---	7.0-8.7b,c
Temperature	°C	0.1	100	13.43	18.00	11.5	n/a	---	---	
Total Suspended Solids	mg/L	1	100	10.83	18.00	4.80	0.118	31,949	31.9	
Sulfide	mg/L	0.0018	100	0.02	0.03	0.01	0.000	52.7	0.05	
Metals Total										
Aluminum	µg/L	3	100	48.7	286	14.7	1.87	139	0.14	
Antimony	µg/L	0.02	100	0.28	0.62	0.19	0.004	1	0.001	
Arsenic	µg/L	0.02	100	0.24	0.51	0.17	0.003	1	0.001	12.5a,c
Barium	µg/L	0.05	100	8.28	20.4	6.21	0.133	26	0.026	
Cadmium	µg/L	0.005	100	0.06	0.27	0.01	0.002	0.2	0.0002	0.12b,c
Calcium	mg/L	0.25	100	18.52	22.0	15.9	0.144	59,958	60.0	
Chromium	µg/L	0.1	100	0.83	2.56	0.41	0.017	2	0.002	
Chromium VI	mg/L	0.00099	56	0.004	0.02	0.001	0.0001	13	0.013	0.015b
Cobalt	µg/L	0.01	100	0.30	0.61	0.23	0.004	1	0.001	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Copper	µg/L	0.1	100	25.0	85.8	7.51	0.561	71	0.07	<2(lt), 3(st)a
Iron	µg/L	5	100	172	711	51.2	4.647	509	0.51	
Lead	µg/L	0.02	100	0.73	2.87	0.33	0.019	2.1	0.002	<2(lt),140(st)a
Magnesium	mg/L	0.25	100	6.71	7.98	5.36	0.052	21,237	21.2	
Manganese	µg/L	0.1	100	32.8	45.1	27.0	0.295	106	0.11	100b
Methyl Mercury	µg/L	0.023	80	0.29	0.99	0.02	0.006	0.6	0.001	
Molybdenum	µg/L	0.05	100	1.59	2.51	0.53	0.016	4.8	0.005	
Monobutyltin	µg/L	0.001	100	0.02	0.06	0.00	0.000	0.04	0.00004	
Monobutyltin Trichloride	µg/L	0.001	100	0.03	0.09	0.01	0.001	0.06	0.0001	
Nickel	µg/L	0.1	100	2.04	3.79	1.43	0.025	6.8	0.007	8.3b
Potassium	mg/L	0.25	100	14.6	17.7	11.6	0.116	46,902	46.9	
Selenium	µg/L	0.04	100	0.20	0.50	0.11	0.003	0.60	0.001	2a
Silver	µg/L	0.01	60	0.05	0.36	0.01	0.002	0.14	0.0001	1.5(lt), 3(st)a
Sodium	mg/L	0.25	100	46.6	46.6	46.6	0.305	155,757	156	
Sulfur	mg/L	3	100	8.50	8.50	8.50	0.056	28,411	28.4	
Tin	µg/L	0.2	100	0.61	1.71	0.30	0.011	1.9	0.002	
Zinc	µg/L	1	100	53.1	155	24.3	1.013	156	0.16	10(lt), 55(st)a
Metals Dissolved										
Aluminum	µg/L	0.5	100	12.97	19.4	9.57	0.127	42	0.042	
Antimony	µg/L	0.02	100	0.24	0.30	0.19	0.002	0.8	0.001	
Arsenic	µg/L	0.02	100	0.21	0.26	0.18	0.002	0.7	0.001	
Barium	µg/L	0.02	100	6.54	7.40	5.37	0.048	21.6	0.022	
Cadmium	µg/L	0.005	100	0.03	0.05	0.01	0.0003	0.09	0.0001	
Calcium	mg/L	0.05	100	18.1	20.8	15.5	0.136	59,217	59.2	
Chromium	µg/L	0.1	100	0.61	0.80	0.48	0.005	1.9	0.002	
Cobalt	µg/L	0.005	100	0.25	0.28	0.22	0.002	0.8	0.001	
Copper	µg/L	0.05	100	13.1	24.5	6.57	0.160	39.9	0.04	
Iron	µg/L	1	100	94.0	134	42.1	0.876	299	0.3	
Lead	µg/L	0.005	100	0.42	0.51	0.29	0.003	1.3	0.001	
Magnesium	mg/L	0.05	100	6.58	7.66	5.75	0.050	21,107	21.1	
Manganese	µg/L	0.05	100	29.3	33.0	19.2	0.216	89.6	0.09	
Molybdenum	µg/L	0.05	100	1.50	2.51	0.43	0.016	4.6	0.005	
Nickel	µg/L	0.02	100	1.77	2.58	1.40	0.017	6.2	0.006	
Phosphorus	µg/L	2	100	2,811	3,730	1,840	24.4	8,655	8.7	
Potassium	mg/L	0.05	100	14.2	16.2	11.8	0.106	46,637	46.6	
Selenium	µg/L	0.04	100	0.18	0.24	0.13	0.002	0.5	0.001	
Silver	µg/L	0.005	80	0.01	0.02	0.01	0.0001	0.03	0.00003	
Sodium	mg/L	0.05	100	50.4	50.4	50.4	0.329	168,458	168	
Sulfur	mg/L	3	100	9.20	9.20	9.20	0.060	30,750	30.8	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Tin	µg/L	0.2	100	0.55	0.73	0.36	0.005	2	0.002	
Zinc	µg/L	0.1	100	39.1	47.5	24.7	0.310	120	0.12	
PAH										
Low Molecular Weight PAH	µg/L	0.014	100	0.12	0.17	0.31	0.002	0.51	0.001	
Naphthalene	µg/L	0.01	67	0.02	0.05	0.01	0.0003	0.1	0.0001	
Phenanthrene	µg/L	0.014	100	0.05	0.13	0.01	0.001	0.2	0.0002	
Total PAH	µg/L	0.02	83	0.15	0.43	0.02	0.003	0.6	0.0006	
Organic Compounds										
Dimethyl Ketone	µg/L	15	83	21.7	31.0	15.0	0.203	64.8	0.06	
Toluene	µg/L	0.4	67	0.47	0.56	0.40	0.004	1.4	0.001	
1,4-Dioxane	µg/L	0.1	100	0.27	0.35	0.21	0.002	1.1	0.001	
1,7-Dimethylxanthine	ng/L	58.4	75	152	216	59.0	1.41	0.39	0.0004	
Pentachlorobenzene	ng/L	0.0261	75	0.04	0.05	0.02	0.0003	0.0001	0.0000001	
Perfluorobutanoic acid	ng/L	1.8	100	6.79	13.5	2.03	0.088	0.016	0.00002	
Trans-Chlordane	ng/L	0.0523	75	0.07	0.14	0.04	0.001	0.0002	0.0000002	
Trichloromethane	µg/L	1	83	1.73	4.20	1.00	0.027	6.5	0.006	
1,2-dichlorobenzene	ng/L	0.261	100	1.06	1.35	0.67	0.009	0.003	0.000003	42,000b,c
1,3-dichlorobenzene	ng/L	0.261	75	40.3	58.6	0.21	0.383	0.08	0.0001	
1,4-dichlorobenzene	ng/L	0.261	100	8.22	26.7	1.93	0.175	0.05	0.0001	
Hexachlorobutadiene	ng/L	0.0169	100	0.29	0.37	0.21	0.002	0.001	0.000001	
Phenolic Compounds	mg/L	0.0015	83	0.01	0.01	0.003	0.00005	16.8	0.02	
High Resolution										
PAH										
1-Methylphenanthrene	ng/L	0.402	100	0.64	0.70	0.56	0.005	0.002	0.000002	
2,3,5-trimethylnaphthalene	ng/L	0.468	100	1.11	1.31	0.83	0.009	0.003	0.000003	
2,6-dimethylnaphthalene	ng/L	0.282	100	0.97	1.29	0.76	0.008	0.003	0.000003	
2-Methylnaphthalene	ng/L	0.2	100	2.83	5.60	1.45	0.037	0.008	0.00001	
Acenaphthene	ng/L	0.201	100	2.38	3.05	0.85	0.020	0.006	0.00001	6,000a
Acenaphthylene	ng/L	0.148	100	0.24	0.28	0.20	0.002	0.001	0.000001	
Benzo[a]anthracene	ng/L	0.192	100	0.34	0.60	0.22	0.004	0.001	0.000001	
Benzo[ghi]perylene	ng/L	0.212	75	0.34	0.54	0.19	0.004	0.001	0.000001	
Chrysene	ng/L	0.209	100	0.85	1.02	0.63	0.007	0.003	0.000003	100a
Dibenzothiophene	ng/L	0.257	100	1.09	1.30	0.94	0.008	0.003	0.000003	
Fluoranthene	ng/L	0.133	100	4.09	4.85	2.46	0.032	0.01	0.00001	
Fluorene	ng/L	0.455	100	2.58	3.42	1.78	0.022	0.008	0.00001	12,000a
Naphthalene	ng/L	0.25	100	5.54	8.08	4.28	0.053	0.07	0.0001	1,000a
Phenanthrene	ng/L	0.364	100	9.79	12.5	6.68	0.082	0.22	0.0002	
Pyrene	ng/L	0.13	100	3.15	3.50	2.33	0.023	0.009	0.00001	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
PBDE										
Pbde 15	pg/L	1.89	100	2.26	2.59	1.99	0.017	0.00001	0.00000001	
Pbde 17/25	pg/L	2.46	100	21.7	23.50	18. 0	0.154	0.0001	0.0000001	
Pbde 203	pg/L	8.3	100	37.5	50.10	14.6	0.327	0.0001	0.0000001	
Pbde 28/33	pg/L	2.42	100	48.0	63.50	28.4	0.415	0.0001	0.0000001	
Pbde 37	pg/L	1.73	100	3.75	5.42	1.60	0.035	0.00001	0.00000001	
Pbde 47	pg/L	1.66	100	2,415	3,430	1,190	22.4	0.006	0.000006	
Pbde 51	pg/L	1.66	100	7.23	10.10	3.96	0.066	0.00002	0.00000002	
Pbde 66	pg/L	2.02	100	35.1	50.0	19.5	0.327	0.0001	0.0000001	
Pbde 71	pg/L	1.66	75	7.66	12.00	1.96	0.078	0.00002	0.00000002	
Pbde 75	pg/L	1.66	100	3.72	5.69	2.29	0.037	0.00001	0.00000001	
Pbde 49	pg/L	1.67	100	53.8	71.00	28.8	0.464	0.0001	0.0000001	
Pbde 79	pg/L	1.66	100	32.4	37.90	27.0	0.248	0.0001	0.0000001	
Pbde 85	pg/L	7.91	100	102	156	41.6	1.02	0.0003	0.0000003	
Pbde 99	pg/L	5.65	100	2,373	3,570	1,000	23.3	0.006	0.000006	
Pbde 100	pg/L	3.74	100	485	724	212	4.73	0.001	0.000001	
Pbde 138/166	pg/L	3.27	100	25.2	36.8	7.61	0.241	0.0001	0.0000001	
Pbde 140	pg/L	2.49	100	7.67	11.60	3.18	0.076	0.00002	0.00000002	
Pbde 153	pg/L	2.86	100	216	324	77.9	2.12	0.001	0.000001	
Pbde 154	pg/L	1.66	100	166	252	64.7	1.65	0.0004	0.0000004	
Pbde 155	pg/L	1.75	100	12.9	17.2	5.53	0.112	0.00003	0.00000003	
Pbde 183	pg/L	1.84	100	30.8	41.8	12.1	0.273	0.0001	0.0000001	
Pbde 206	pg/L	6.76	100	288	367	121	2.40	0.001	0.000001	
Pbde 207	pg/L	6.86	100	369	473	176	3.09	0.001	0.000001	
Pbde 208	pg/L	8.09	100	270	344	125	2.25	0.001	0.000001	
Pbde 209	pg/L	31.7	100	3,653	4,770	1,310	31.2	0.009	0.000009	
PCB										
Pcb 1	pg/L	1.13	100	4.42	4.80	4.05	0.031	0.00001	0.00000001	
Pcb 2	pg/L	0.893	100	1.61	2.63	1.19	0.017	0.00001	0.00000001	
Pcb 3	pg/L	0.957	100	4.73	7.35	2.57	0.048	0.00001	0.00000001	
Pcb 4	pg/L	3.99	100	13.3	19.50	6.19	0.127	0.00003	0.00000003	
Pcb 8	pg/L	1.88	100	8.90	11.80	5.56	0.077	0.00003	0.00000003	
Pcb 11	pg/L	2.07	100	49.8	62.30	30.7	0.407	0.0001	0.0000001	
Pcb 15	pg/L	2.49	100	8.71	13.70	3.65	0.090	0.00002	0.00000002	
Pcb 16	pg/L	1.52	100	12.6	18.90	3.73	0.124	0.00003	0.00000003	
Pcb 17	pg/L	1.25	100	11.0	16.20	3.38	0.106	0.00003	0.00000003	
Pcb 18/30	pg/L	1.04	100	25.1	39.10	8.59	0.256	0.0001	0.00000006	
Pcb 19	pg/L	1.69	100	3.88	5.62	1.70	0.037	0.00001	0.00000001	
Pcb 20/28	pg/L	0.861	100	30.3	45.90	9.84	0.300	0.0001	0.00000007	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Pcb 21/33	pg/L	0.861	100	12.1	17.60	4.64	0.115	0.00003	0.00000003	
Pcb 22	pg/L	0.861	100	11.6	17.80	4.17	0.116	0.00003	0.00000003	
Pcb 25	pg/L	0.861	100	1.97	2.91	0.68	0.019	0.000005	0.000000005	
Pcb 26/29	pg/L	0.861	100	5.22	8.00	1.33	0.052	0.00001	0.00000001	
Pcb 27	pg/L	0.884	60	1.82	2.89	0.68	0.019	0.000004	0.000000004	
Pcb 31	pg/L	0.861	100	26.2	37.80	9.20	0.247	0.0001	0.00000006	
Pcb 32	pg/L	0.861	100	6.43	9.95	2.28	0.065	0.00002	0.00000002	
Pcb 35	pg/L	0.861	60	1.41	1.94	0.69	0.013	0.000004	0.000000004	
Pcb 37	pg/L	0.924	100	7.99	12.90	3.33	0.084	0.00002	0.00000002	
Pcb 40/41/71	pg/L	1.37	100	12.2	16.70	4.48	0.109	0.00003	0.00000003	
Pcb 42	pg/L	1.44	100	5.70	8.52	2.37	0.056	0.00002	0.00000002	
Pcb 43	pg/L	1.79	60	1.52	2.21	0.70	0.014	0.000004	0.000000004	
Pcb 44/47/65	pg/L	1.25	100	63.2	82.20	29.0	0.537	0.0002	0.0000002	
Pcb 45/51	pg/L	1.41	100	8.95	11.00	4.48	0.072	0.00003	0.00000003	
Pcb 46	pg/L	1.62	80	1.78	2.25	0.68	0.015	0.000005	0.000000005	
Pcb 48	pg/L	1.38	100	5.70	8.83	1.98	0.058	0.00001	0.00000001	
Pcb 49/69	pg/L	1.16	100	12.4	18.00	3.83	0.118	0.00003	0.00000003	
Pcb 50/53	pg/L	1.38	100	3.24	4.86	0.75	0.032	0.00001	0.00000001	
Pcb 52	pg/L	1.31	100	30.8	40.10	12.4	0.262	0.0001	0.00000008	
Pcb 56	pg/L	1.4	100	9.38	13.50	2.77	0.088	0.00002	0.00000002	
Pcb 59/62/75	pg/L	1.03	100	2.54	3.56	0.90	0.023	0.00001	0.00000001	
Pcb 60	pg/L	1.39	100	5.76	8.25	1.44	0.054	0.00001	0.00000001	
Pcb 61/70/74/76	pg/L	1.33	100	36.5	50.40	14.0	0.329	0.0001	0.0000001	
Pcb 64	pg/L	1	100	11.1	15.60	3.19	0.102	0.00003	0.00000003	
Pcb 66	pg/L	1.31	100	16.4	24.80	5.44	0.162	0.00004	0.00000004	
Pcb 68	pg/L	1.26	80	3.32	4.77	1.61	0.031	0.00001	0.00000001	
Pcb 72	pg/L	1.26	60	1.55	1.98	0.68	0.013	0.000004	0.000000004	
Pcb 82	pg/L	1.65	80	2.63	3.49	1.10	0.023	0.00001	0.00000001	
Pcb 83/99	pg/L	1.56	100	13.7	17.30	6.14	0.113	0.00004	0.00000004	
Pcb 84	pg/L	1.69	100	6.69	9.09	2.19	0.059	0.00002	0.00000002	
Pcb 85/116/117	pg/L	1.23	100	4.12	5.26	1.84	0.034	0.00001	0.00000001	
Pcb 86/87/97/108/119/125	pg/L	1.29	100	18.0	21.80	7.70	0.142	0.0001	0.00000005	
Pcb 88/91	pg/L	1.51	100	3.34	4.50	1.06	0.029	0.00001	0.00000001	
Pcb 90/101/113	pg/L	1.33	100	23.6	29.10	10.6	0.190	0.0001	0.00000007	
Pcb 92	pg/L	1.51	100	3.91	4.91	2.03	0.032	0.00001	0.00000001	
Pcb 93/95/98/100/102	pg/L	1.48	100	23.2	31.50	11.4	0.206	0.0001	0.00000007	
Pcb 105	pg/L	1.64	100	7.27	9.09	3.97	0.059	0.00002	0.00000002	900a
Pcb 109	pg/L	1.33	60	1.13	1.59	0.74	0.010	0.000003	0.000000003	
Pcb 110/115	pg/L	1.11	100	23.3	28.40	11.00	0.186	0.0001	0.00000007	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Pcb 118	pg/L	1.68	100	19.6	24.20	9.80	0.158	0.0001	0.00000006	
Pcb 128/166	pg/L	1.34	100	2.70	3.23	1.23	0.021	0.00001	0.00000001	
Pcb 129/138/160/163	pg/L	1.33	100	18.9	24.40	8.80	0.159	0.0001	0.00000006	
Pcb 130	pg/L	1.67	60	1.35	1.79	0.84	0.012	0.000004	0.000000004	
Pcb 132	pg/L	1.67	100	5.88	8.94	2.42	0.058	0.00002	0.00000002	
Pcb 135/151/154	pg/L	1.52	100	6.35	8.09	2.64	0.053	0.00002	0.00000002	
Pcb 136	pg/L	1.2	100	2.65	3.59	1.05	0.023	0.00001	0.00000001	
Pcb 141	pg/L	1.48	80	2.91	4.32	0.70	0.028	0.00001	0.00000001	
Pcb 146	pg/L	1.32	100	3.45	5.15	1.09	0.034	0.00001	0.00000001	
Pcb 147/149	pg/L	1.44	100	13.5	17.00	5.12	0.111	0.00004	0.00000004	
Pcb 153/168	pg/L	1.2	100	19.4	25.60	9.04	0.167	0.0001	0.00000006	
Pcb 155	pg/L	1.24	100	2.06	2.83	0.78	0.018	0.00001	0.00000001	
Pcb 156/157	pg/L	1.53	100	3.15	4.39	1.58	0.029	0.00001	0.00000001	
Pcb 158	pg/L	1.04	100	1.87	2.48	1.00	0.016	0.00001	0.00000001	
Pcb 164	pg/L	1.09	80	1.07	1.41	0.68	0.009	0.000003	0.000000003	
Pcb 170	pg/L	1.67	100	3.98	5.21	2.04	0.034	0.00001	0.00000001	
Pcb 171/173	pg/L	1.71	80	1.43	1.74	1.15	0.011	0.000005	0.000000005	
Pcb 172	pg/L	1.74	60	1.17	1.74	0.76	0.011	0.000004	0.000000004	
Pcb 174	pg/L	1.6	100	3.90	4.99	2.36	0.033	0.00001	0.00000001	
Pcb 184	pg/L	1.15	100	3.34	4.70	1.27	0.031	0.00001	0.00000001	
Pcb 177	pg/L	1.75	80	2.10	3.53	0.86	0.023	0.00001	0.00000001	
Pcb 178	pg/L	1.66	60	1.33	1.66	0.70	0.011	0.000004	0.000000004	
Pcb 179	pg/L	1.15	100	1.97	2.94	0.76	0.019	0.00001	0.00000001	
Pcb 180/193	pg/L	1.57	100	12.1	15.40	4.29	0.101	0.00003	0.00000003	
Pcb 183/185	pg/L	1.54	100	2.90	3.40	1.43	0.022	0.00001	0.00000001	
Pcb 187	pg/L	1.51	100	6.82	8.68	3.30	0.057	0.00002	0.00000002	
Pcb 194	pg/L	1.33	100	2.37	2.74	1.38	0.018	0.00001	0.00000001	
Pcb 196	pg/L	1.62	60	1.18	1.62	0.78	0.011	0.000004	0.000000004	
Pcb 198/199	pg/L	1.68	80	2.94	4.24	0.74	0.028	0.00001	0.00000001	
Pcb 202	pg/L	1.33	60	1.12	1.34	0.68	0.009	0.000003	0.000000003	
Pcb 203	pg/L	1.53	60	1.67	2.32	0.68	0.015	0.000004	0.000000004	
Pcb 209	pg/L	2.03	80	3.06	4.41	1.89	0.029	0.00001	0.00000001	
Total Hexachloro Biphenyls	pg/L	1.53	100	73.1	93.70	32.3	0.612	0.0002	0.0000002	
Total Dichloro Biphenyls	pg/L	1.53	100	82.0	126.00	49.8	0.824	0.0002	0.0000002	
Total Heptachloro Biphenyls	pg/L	1.53	100	30.7	44.10	14.0	0.288	0.0001	0.00000008	
Total Monochloro Biphenyls	pg/L	1.53	100	5.71	7.94	3.97	0.052	0.00002	0.00000002	
Total Pentachloro Biphenyls	pg/L	1.53	100	133	158	58.2	1.033	0.0004	0.0000004	
Total Tetrachloro Biphenyls	pg/L	1.53	100	210	312	85.3	2.039	0.0005	0.0000005	
Total Trichloro Biphenyls	pg/L	1.53	100	142.98	233	44.1	1.523	0.0003	0.0000003	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Pcb Teq 3	pg/L	1.53	100	0.02	0.10	0.00	0.001	0.0000001	0.0000000001	
Pcb Teq 4	pg/L	1.53	100	1.06	1.13	0.97	0.007	0.000003	0.000000003	
PCBs Total	pg/L	1.53	100	683	935	293	6.11	0.002	0.000002	100a
Nonylphenol										
4-Nonylphenol Monoethoxylates	ng/L	5.84	100	541	965	96.2	6.31	1.35	0.001	700b
NP	ng/L	5.55	100	87.2	145	15.4	0.95	0.24	0.0002	700b
PCDD										
1,2,3,4,6,7,8-HPCDD	pg/L	0.626	100	1.37	1.88	0.93	0.012	0.000004	0.000000004	
OCDD	pg/L	0.626	100	6.02	8.69	3.88	0.057	0.00002	0.00000002	
Total Hepta-Dioxins	pg/L	0.626	80	0.90	1.46	0.58	0.01	0.000003	0.000000003	
Pesticides										
4,4-DDE	ng/L	0.0918	100	0.09	0.12	0.06	0.001	0.0003	0.0000003	
Alpha-Endosulfan	ng/L	0.131	100	0.27	0.35	0.13	0.002	0.001	0.000001	
Beta-Endosulfan	ng/L	0.131	100	0.56	0.73	0.34	0.005	0.002	0.000002	1.6b
Dieldrin	ng/L	0.131	100	0.14	0.14	0.13	0.001	0.0005	0.0000005	
Hch, Gamma	ng/L	0.0916	100	0.19	0.32	0.09	0.002	0.0005	0.0000005	
Hexachlorobenzene	ng/L	0.0261	100	0.07	0.09	0.06	0.001	0.0002	0.0000002	
PFOS										
Perfluoroheptanoic Acid (PFHpA)	ng/L	0.449	100	2.09	3.07	0.96	0.02	0.007	0.000007	
Perfluorohexanoic Acid (PFHxA)	ng/L	0.449	100	10.7	12.9	7.72	0.084	0.034	0.00003	
Perfluorononanoic Acid (PFNA)	ng/L	0.449	100	1.16	1.57	0.84	0.01	0.004	0.000004	
Perfluorooctane Sulfonamide (PFOSA)	ng/L	0.449	100	0.91	2.32	0.45	0.015	0.004	0.000004	
Perfluorooctanesulfonic acid	ng/L	0.449	100	2.96	5.04	1.96	0.033	0.011	0.00001	
Perfluorooctanoic acid (PFOA)	ng/L	0.449	100	6.53	8.78	4.35	0.057	0.022	0.00002	
Perfluoropentanoic Acid (PFPeA)	ng/L	0.898	100	16.5	19.2	10.9	0.125	0.052	0.00005	
PFBS	ng/L	0.449	100	2.11	3.65	1.59	0.024	0.008	0.000008	
PFHxS	ng/L	0.449	100	3.21	4.61	2.78	0.03	0.011	0.00001	
PPCP										
2-Hydroxy-Ibuprofen	ng/L	6.97	100	5,564	10,400	92	68.0	10.1	0.01	
Azithromycin	ng/L	6.97	100	503	586	281	3.83	1.4	0.001	
Bisphenol A	ng/L	13.6	100	130	253	54.5	1.65	0.47	0.0005	900b
Caffeine	ng/L	14.6	75	91.23	159	14.7	1.04	0.2	0.0002	
Carbamazepine	ng/L	1.58	100	627	660	605	4.31	2.1	0.002	
Ciprofloxacin	ng/L	10.2	100	260	292	235	1.91	0.8	0.001	
Clarithromycin	ng/L	1.99	100	395	427	330	2.79	1.3	0.001	
Dehydronifedipine	ng/L	0.741	100	13.0	13.8	11.4	0.09	0.04	0.00004	
Diltiazem	ng/L	0.992	100	542	680	297	4.44	1.5	0.001	
Diphenhydramine	ng/L	0.584	100	748	927	265	6.06	1.9	0.002	
Erythromycin-H2O	ng/L	2.24	100	27.9	89.7	6.59	0.59	0.17	0.0002	

Table 3.4, continued

Parameter Name	Unit Code	Detection Limit	% Freq	Average Concentration	Max	Min	Max Diluted (1:153)	Average Eff Load (kg/year)	Average Eff Load (tonne/year)	WQG
Equilenin	ng/L	0.396	60	0.80	1.14	0.40	0.01	0.002	0.000002	
Fluoxetine	ng/L	4.87	100	43.7	60.6	32.4	0.40	0.15	0.0001	
Furosemide	ng/L	3.89	100	1,460	1,950	542	12.7	3.9	0.004	
Gemfibrozil	ng/L	0.778	100	31.8	82.6	18.5	0.54	0.12	0.0001	
Glyburide	ng/L	0.778	100	2.85	3.58	1.97	0.02	0.01	0.00001	
Hydrochlorothiazide	ng/L	16.3	100	2,465	2,900	1,870	19.0	7.5	0.007	
Ibuprofen	ng/L	3.89	100	1,345	2,800	11.7	18.3	2.3	0.002	
Miconazole	ng/L	1.59	100	3.19	3.90	2.20	0.03	0.009	0.00001	
Naproxen	ng/L	1.95	100	454	1,260	167	8.24	1.9	0.002	
Ofloxacin	ng/L	1.46	100	10.9	15.8	3.81	0.10	0.03	0.00003	
Sulfamethoxazole	ng/L	2.47	100	780	1,080	642	7.06	2.98	0.003	
Sulfanilamide	ng/L	14.6	100	56.9	85.7	43.6	0.56	0.23	0.0002	
Thiabendazole	ng/L	1.46	100	27.4	31.2	19.0	0.20	0.08	0.0001	
Triclocarban	ng/L	0.389	83	1.33	1.94	0.51	0.01	0.003	0.000003	
Triclosan	ng/L	5.84	100	27.5	42.4	12.9	0.28	0.09	0.0001	
Trimethoprim	ng/L	1.66	100	446	485	410	3.17	1.54	0.002	
Tylosin	ng/L	11.1	75	19.5	25.3	11.8	0.17	0.05	0.0001	
Warfarin	ng/L	0.389	100	7.39	9.10	4.64	0.06	0.02	0.00002	
Androstenedione	ng/L	2.28	60	2.10	4.03	0.97	0.03	0.01	0.00001	

Notes:

[1] As determined by Hayco (2005); n/a=not applicable; ND=not detected; --- parameter does not lend itself to calculating loading, e.g. pH

a=BC Approved Water Quality Guideline; b=BC Working Water Quality Guideline; c=CCME Water Quality Guideline for the protection of Aquatic Life; d=Health Canada Guidelines for Recreational Water Quality

*Concentrations are incorporated into compliance monitoring mean values presented in Table 3.2 and Table 3.3. ^loadings for NH_3 and TSS were calculated using available daily/weekly data rather than quarterly data only, in order to increase accuracy

Shaded cells indicate an exceedance of one or more WQG. Note that this table does not include the results of the compliance and treatment plant performance monitoring, as discussed in Section 3.3.1 and presented in Table 3.2.

Table 3.5 2021 Acute Toxicity Results

Wastewater Concentration	Rainbow trout LC50 96-hour (Onchorhynchus mykiss)				Daphnia magna LC50 48-hour			
%v/v	mortality # (96-hr)				mortality # (48-hr)			
	Jan	Apr	Aug	Oct	Jan	Apr	Aug*	Oct
0	0	0	0	0	0	0	---	0
6.25	0	0	0	0	0	0	---	0
12.5	0	0	0	0	0	0	---	0
25	0	0	0	0	0	0	---	0
50	0	0	0	0	0	0	---	0
100	0	0	0	0	0	0	---	0

Notes:
*Due to sampler error, acute toxicity was conducted in August instead of July, and for Rainbow trout only.

Table 3.6 2021 Chronic Toxicity Results

Test	Endpoint (%v/v)	
	EC50 or IC50	EC25/LC25
Rainbow Trout (*Onchorhynchus mykiss*) Embryo/Alevin Test		
• embryo survival	>100	>100
• embryo viability	>100	>100
7-day Topsmelt (*Atherinops affinis*) survival and growth test		
• survival	>100	---
• growth	>100	>100
6-day *Ceriodaphnia* test		
• survival	>100	---
• reproduction	>100	>100
Echinoid fertilization (*Strongylocentrotus purpuratus*)	>100	>100

Notes:
*EC50 = Concentration that causes an observable effect in 50% of the test organisms, EC25 = Concentration that causes an observable effect in 25% of the test organisms, LC50= Lethal Concentration to 50% of organisms in the test duration
-- Not tested

4.0 BIOSOLIDS MONITORING

4.1 Introduction

In the SPTP LWMP, the CRD and its partner municipalities on the Saanich Peninsula made a commitment to implement a biosolids management plan, based on the following specific commitments:

- Pursue an effective and diversified program for the beneficial use of Class A biosolids that incorporates an economically viable and long-term solution.
- Mitigate nuisances associated with the production and application of biosolids, including odour, noise, truck traffic and dust.
- Manage biosolids to ensure that detrimental effects to public health and the environment are avoided.

The SPTP can produce Class A biosolids, in accordance with the pathogen reduction and vector attraction reduction processes in the ENV (BC MoE, 2002) *Organic Matter Recycling Regulations* (BC OMRR). These regulations define process and quality criteria for biosolids production and establish land application and distribution requirements. The regulations are set to protect human and environmental health.

In 2008, the CRD developed the PenGrow program to produce a soil enhancer product from the Class A biosolids. Biosolids were an end product of the sewage treatment process and were produced when solids (i.e., sludge) were treated. The product was cured and stored at the CRD's Hartland Landfill and the PenGrow program was intermittently in production until early 2011.

In July 2011, the PenGrow program was put on hold following CRD Board motions that "[ended] the production, storage and distribution of biosolids for land application at all CRD facilities and parks", including Hartland Landfill, and indicated the region "does not support the application of biosolids on farmland in the CRD under any circumstances." CRD staff are currently investigating a number of longer-term beneficial use options for the biosolids and sludge. Until alternative non-land application markets for the biosolids can be developed and implemented, all sludge will be disposed of as controlled waste at the Hartland Landfill. The SPTP generated 3,720 tonnes of dewatered sludge in 2021.

Detailed statistical trend analyses are undertaken every three to five years to quantitatively assess temporal trends in concentrations and loadings of wastewater parameters. In 2012, Golder Associates (Golder, 2013) updated the previous trend assessment to include the 2009-2011 results, expanding the total SPTP dataset from 2000-2011. Results of this assessment were presented in the 2011 annual report (CRD, 2012). The most recent trend assessment was completed in 2017 (Golder, 2019) and included the next three years of biosolids data (2012-2015). Results were included in the 2016 report (CRD, 2017).

Starting in 2013, the CRD commenced monitoring the sludge in order to help inform the RSCP on the partitioning behaviour of some wastewater contaminants between the solid and liquid phases of the treatment processes. Metals were of primary interest, as they fall under the RSCP's regulatory regime.

4.2 Methods

Sludge was produced at the SPTP and analyzed for similar parameters as previous years (Table 4.1). Sludge was collected monthly, with replicate samples collected in February and September.

4.3 Results and Discussion

In 2021, 40 parameters were monitored in the SPTP sludge. For those parameters that are BC OMRR regulated, all results were far below the Class A biosolids limit (Table 4.1), similar to previous years.

4.4 Overall Assessment

No biosolids were produced at the SPTP in 2021. It is unknown if or when production will recommence. However, the sludge monitoring data collected to inform the RSCP showed that all OMRR regulated parameters continue to be far below Class A biosolids limits. The sludge will continue to be disposed of as controlled waste at the Hartland Landfill until their long-term use is determined.

Table 4.1 SPTP Sludge Monitoring, 2021

Parameter	Units	Class A Biosolids Limit (mg/kg)	Jan	Feb FR1	Feb FR2	Mar	Apr	May	Jun	Jul	Aug	Sep FR1	Sep FR2	Oct	Nov	Dec	Average
Regulated Parameters																	
Arsenic	mg/kg dry	75	1.08	1.15	1.12	0.91	0.8	0.7	0.84	--	---	0.7	0.7	0.88	0.64	1.01	0.88
Cadmium	mg/kg dry	20	0.383	0.647	0.626	0.542	0.677	0.629	0.948	--	---	0.546	0.633	0.709	0.516	0.888	0.65
Chromium	mg/kg dry	1,060	11.7	9.1	8.4	6.8	6.5	6.5	7.9	--	---	5.6	5.6	7.2	14.3	12.4	8.50
Cobalt	mg/kg dry	151	1.14	1.29	1.18	0.94	0.83	0.83	0.99	--	---	0.82	0.85	1.06	1.03	1.34	1.03
Copper	mg/kg dry	757	227	359	340	325	244	210	235	--	---	189	207	209	145	183	239
Lead	mg/kg dry	505	13.3	9.88	9.26	7.77	7.25	6.95	8.36	--	---	7.53	8.26	9.28	8.55	8.42	8.73
Mercury	mg/kg dry	5	0.162	0.255	0.237	0.407	0.21	0.213	0.259	--	---	0.176	0.247	0.223	0.138	0.335	0.24
Molybdenum	mg/kg dry	20	2.92	3.52	3.25	3.02	3.31	2.89	3.35	--	---	2.82	2.87	3.32	3.45	3.8	3.21
Nickel	mg/kg dry	181	8.02	8.07	7.55	5.66	5.23	5.13	6.06	--	---	4.9	5.4	7.21	11.3	10.7	7.10
Selenium	mg/kg dry	14	1.4	1.8	1.72	1.61	1.93	1.69	1.94	--	---	1.64	1.75	1.79	1.01	1.63	1.66
Thallium	mg/kg dry	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	--	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	mg/kg dry	656	5.5	6.8	6.4	4.1	2.9	2.4	2	--	---	1.5	1.6	2.7	2.6	5.4	3.66
Zinc	mg/kg dry	1,868	183	251	235	224	260	282	374	--	---	290	313	346	234	238	269
Unregulated Parameters																	
Total dry weight	% wet	n/a	--	---	--	19.9	24.1	21.2	21.7	--	---	--	---	--	---	--	21.7
pH	pH	n/a	5.44	5.66	5.76	5.5	5.7	5.19	5.58	--	---	5.85	5.53	5.46	5.73	5.57	5.58
WAD Cyanide	mg/kg dry	n/a	<5.08	<5.15	<5.18	<5.01	<4.16	<0.47	<4.61	--	---	0.43	0.37	0.37	0.56	<4.07	0.43
Aluminum	mg/kg dry	n/a	2390	2660	2430	1560	988	910	1040	--	---	870	939	1160	1300	2340	1,549
Antimony	mg/kg dry	n/a	1.03	0.74	0.77	0.56	0.86	0.69	1.01	--	---	0.9	0.89	0.64	0.5	0.66	0.77
Barium	mg/kg dry	n/a	36.9	53.7	49.9	40.5	44	50.4	49.4	--	---	43.6	44.6	40.2	30.5	43.6	43.94
Beryllium	mg/kg dry	n/a	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	mg/kg dry	n/a	10.7	13.1	11.6	12.3	13.7	14.5	15.4	--	---	13.9	14.9	16.7	10.7	13.4	13.4
Boron	mg/kg dry	n/a	18.1	18.4	16.7	12.5	8.5	9.1	22.5	--	---	11.5	12	12.7	8.5	13.9	13.7
Calcium	mg/kg dry	n/a	4820	6040	5530	5680	5500	6520	6610	--	---	5250	5500	6360	5960	6220	5,833
Iron	mg/kg dry	n/a	3160	3790	3530	2710	2020	1780	2030	--	---	1610	1710	2110	2620	3130	2,517
Lithium	mg/kg dry	n/a	1.41	1.43	1.33	0.85	0.4	0.43	0.37	--	---	0.32	0.39	0.48	0.62	1.42	0.79
Magnesium	mg/kg dry	n/a	2810	2790	2610	1930	2520	3760	4120	--	---	4680	4730	4010	3070	2880	3,326
Manganese	mg/kg dry	n/a	65.3	88	82.5	75.1	42	44.8	45	--	---	37.6	39.3	43.7	43.7	75.9	56.9
Phosphorus	mg/kg dry	n/a	10400	11100	10200	9060	12600	16300	18400	--	---	17900	18700	16000	11200	11100	13,580
Potassium	mg/kg dry	n/a	3190	3490	3410	2490	3880	5060	6430	--	---	5850	6040	5780	3380	3080	4,340
Silver	mg/kg dry	n/a	0.87	1.07	1.04	0.94	0.91	0.84	1.02	--	---	0.94	1	0.94	0.81	1	0.95

Table 4.1, continued

Parameter	Units	Class A Biosolids Limit (mg/kg)	Jan	Feb FR1	Feb FR2	Mar	Apr	May	Jun	Jul	Aug	Sep FR1	Sep FR2	Oct	Nov	Dec	Average
Sodium	mg/kg dry	n/a	243	364	354	329	331	400	448	--	---	402	409	360	214	372	352
Strontium	mg/kg dry	n/a	19.1	22.6	21.1	18	17.1	22.6	24.2	--	---	17.4	18	18.9	16.8	19.5	19.6
Sulfur	mg/kg dry	n/a	2210	4800	4020	3730	4350	3730	4520	--	---	4260	4220	5620	2930	4360	4,063
Tellurium	mg/kg dry	n/a	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	--	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Thorium	mg/kg dry	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	--	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tin	mg/kg dry	n/a	5.93	9.33	8.46	8.4	9.41	9.31	9.29	--	---	8.66	9.1	9.1	7.09	12.1	8.85
Titanium	mg/kg dry	n/a	26.4	51.7	24.2	44.3	29.9	54.2	15	--	---	45.7	36.9	33	44	65.2	39.2
Tungsten	mg/kg dry	n/a	0.23	0.31	0.32	0.34	0.31	0.33	0.5	--	---	0.48	0.63	0.45	0.35	0.4	0.39
Uranium	mg/kg dry	n/a	0.46	0.48	0.436	0.437	0.355	0.3	0.309	--	---	0.164	0.176	0.286	0.269	0.453	0.34
Zirconium	mg/kg dry	n/a	3.5	2.8	2	2.8	2.9	4.7	2.7	--	---	7.3	5.9	2.5	2.8	5.4	3.78

Notes:

*From Organic Matter Recycling Regulation (B.C. Reg. 18/2002, Schedule 4 Section 3, February 28, 2019), which references Trade Memorandum T-4-93 'Safety Guidelines for Fertilizers and Supplements' (Sept 1997) and contains maximum acceptable metal concentrations based on annual application rates (mg metal/kg product) 4,400 kg/ha –yr.

FR1 and FR2 indicate two samples (field replicates) collected that month as part of QA/QC protocols

--- Indicates data not available / sample not collected

5.0 RECEIVING ENVIRONMENT MONITORING

Receiving environment monitoring is undertaken to assess human health and environmental impacts of the SPTP outfall. In addition, the results are used to verify the environmental concentrations of parameters that are predicted using wastewater concentration data and the 1:153 minimum initial dilution factor determined during the 2004 dye study (Hayco, 2005) (discussed in Section 3.0).

5.1 Introduction

The CRD conducts receiving environment monitoring adjacent to the SPTP wastewater discharge to assess the potential for human health risk for those participating in recreational activities (e.g., swimmers, kayakers) at the surface near the outfall (see Appendix C1 for site coordinates). In addition, monitoring data are used to assess potential risks to shellfish harvesting in the vicinity of the SPTP outfall, although there is no commitment in the LWMP to meet this standard outside of shellfish growing areas. Finally, surface waters are monitored to ensure that the outfall diffuser is functioning as expected and a minimum initial dilution of 153:1 is being achieved.

A review of the SPTP WMEP was conducted in 2011/2012, in partnership with ENV, including the surface water component. As a result of the review, the surface water sampling program was revised. Beginning in 2013, the fecal coliform sampling was switched from monthly to twice yearly, 5-in-30 sampling (Table 2.1) in order to align more closely with the ENV fecal coliform guideline, based on the geometric mean of five samples collected in 30 days not exceeding 200 CFU/100 mL. In addition, enterococci were analysed along with fecal coliforms, as they are a more persistent tracer of human waste in the marine environment, and have a more direct correlation with adverse human health impacts. Metal and conventional parameter concentrations were also added as extended analyses to the surface water monitoring program (Appendix C2) to confirm environmental concentrations that were previously only predicted by using wastewater data (Section 3.0) and applied minimum initial dilution factors.

5.2 Methods

The CRD sampling technicians sampled surface waters and the water column over two sampling periods ("winter", i.e., January/February 2021 and "summer", i.e., June/July 2021) using a 5 m research vessel positioned by global positioning system.

Each sampling period consisted of five individual sampling days occurring over a 30-day period ("5-in-30"). Nineteen stations at different distances from the outfall terminus were sampled. Sampling stations consisted of 14 outfall stations, one reference station located near Sidney Island, and four variable stations located at the edge of the IDZ (Figure 5.1). Station codes describe the distance from the outfall terminus in metres with compass direction (i.e., 100N = 100 m north of the outfall). The variable IDZ stations were selected at the time of sampling based on a computer model prediction (Lorax, 2021) of what depth and direction the effluent plume would most likely be trapped due to tides, current flow and direction. See Appendix C1 for a list of stations and coordinates.

Surface samples were collected at a depth of 1 m using a sampling pole. Sterile wide-mouth bottles were placed in the pole holder with the lid removed, submerged to collection depth, brought to the surface, and then excess water poured off before the lid was screwed on tightly.

IDZ samples and reference station samples were collected at three depths for each station: "top" (1 m below the surface), "middle" (calculated trapping depth from the computer model prediction), and "bottom" (1 m above the seafloor). An open, set, horizontal Niskin sampling bottle was deployed to the appropriate depth and closed using a weighted messenger. The bottle was then pulled back to the surface and decanted into the required sample containers. All samples were stored in coolers with ice until delivery to the analytical laboratory.

Surface water samples were analyzed by Bureau Veritas Laboratories Inc. (Burnaby, BC) for various parameters, depending on the sampling site and the sampling day. A larger list of parameters, including metals, was analyzed on a single day of each five-day sampling series and results compared to applicable BC WQG. Metals analysis was conducted by ALS Environmental (Victoria, BC). See Appendix A for the list of surface water parameters and the analytical frequency for each.

Bacteriology results were averaged as geometric means and compared to the provincial and federal enterococci guidelines of 35 CFU/100 mL and to the single sample maximum of 70 CFU/100 mL (BCMoE&CCS, 2019, Health Canada, 2012). In addition, results were compared to Canadian Shellfish Sanitation Program (CSSP) guidelines for shellfish harvesting, which require that the geomean of fecal coliform results not exceed 14 CFU/100 mL and not more than 10% of the samples exceed 43 CFU/100 mL (CSSP, 2019).

IDZ samples were analysed for parameters that reflect the suite of nutrients in the SPTP wastewater monitoring program. Both programs monitor ammonia, total Kjeldahl nitrogen (TKN), nitrate, nitrite, total phosphorus, conductivity, pH, salinity and total organic carbon. While some parameters may not be relevant in the marine receiving environment (e.g., ammonia is measured in wastewater, but is primarily found in the ammonium form in marine waters), they are still monitored to allow for direct comparison of the two sets of results. This suite of nutrients has also been monitored since before the SPTP commenced discharging into Bazan Bay, as part of the pre-discharge monitoring program.

CRD - Parks & Environmental Services - Sep 30, 2014 - Technologist: SR - Map Document: SaanPenSurfaceSampleLocations2013.mxd

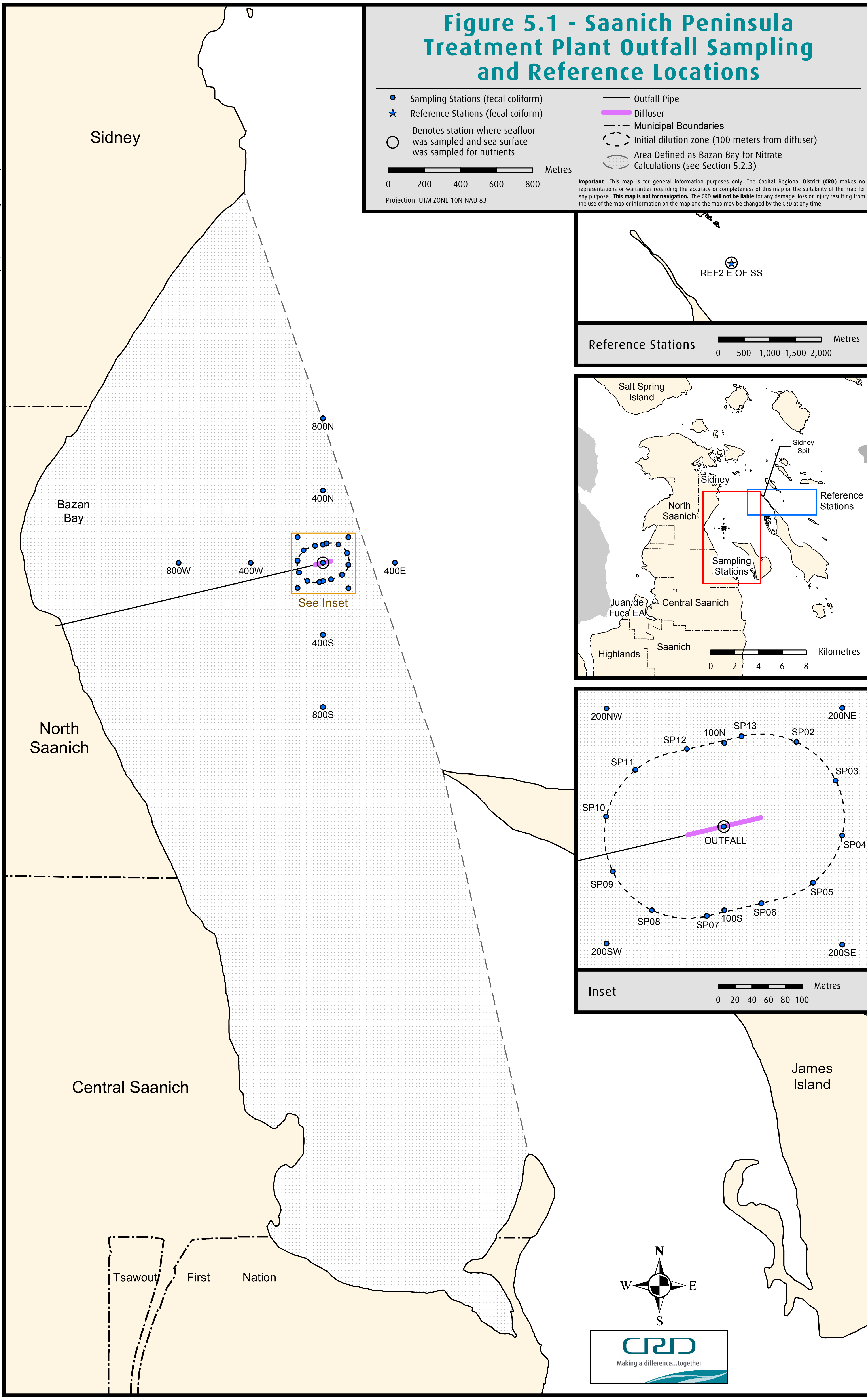


Figure 5.1 - Saanich Peninsula Treatment Plant Outfall Sampling and Reference Locations

5.3 Results and Discussion

Bacteriology

Results show that all stations had very low concentrations of fecal coliforms and enterococci for both the summer and winter 5-in-30 sampling programs (Figure 5.2, Table 5.1, Table 5.2, Table 5.3 and Table 5.4). Figure 5.2 utilizes the maximum value detected for each sampling depth on each sampling event for the calculated geomeans. No single sample or geomean was over the respective human recreation or shellfish harvesting guidelines at the surface water (1 m depth) stations throughout the water column, with a maximum geomean of 1 CFU/100 mL recorded for both fecal coliforms and enterococci (Table 5.1 and Table 5.2). The IDZ stations had a maximum geomean of 5 CFU/100 mL for fecal coliform and 2 CFU/100 mL for enterococci (Table 5.2, Table 5.3 and Table 5.4).

All surface water fecal coliform concentrations were well below the conservatively predicted environmental concentration of 1,307 CFU/100 mL, after the minimal initial dilution (1:153) (Hayco, 2005) was applied to the maximum effluent fecal coliform concentration of 200,000 CFU/100 mL (Table 3.4). Similar observations were made for enterococci, where surface water results were well below the 340 CFU/100 mL that was predicted using the maximum effluent enterococci concentration of 52,000 CFU/100 mL and the 153:1 dilution factor.

These results are generally consistent with previous years and previous studies (CRD, 2002-2020), including Island Health's summer beach sampling program that involves monitoring the nearshore environment in Bazan Bay, targeting beaches that are most commonly used for recreation.

Overall, the bacteriological sampling results, and previous dye study results (Hayco, 2005), indicate that the plume was predominantly trapped below the surface and that adverse health effects from recreational primary contact activities or the consumption of shellfish are not likely. There were no enterococci or fecal coliform geomean results or single sample results that exceeded the BC or Health Canada guidelines for the protection of human health, or the CSSP guidelines for shellfish harvesting. The values in Figure 5.2Figure 5.2 use the maximum concentrations for each sampling day and depth to build a "worst case" scenario, e.g., a geomean of 19 CFU/100mL for summer middle depth fecal coliform.

As a conservative measure by the federal government, an area of approximately 17.65 km^2 around the outfall is closed for shellfish harvesting, as a standard Fisheries and Oceans Canada procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall due to a proximity to an urban centre where there are other potential sources of bacterial contamination (e.g., stormwater outfalls, marinas, septic systems, sewage pumps). This conservative protection area would also ensure shellfish consumer safety in a flood situation where the treatment plant or conveyance system pump stations were overwhelmed.

Metals

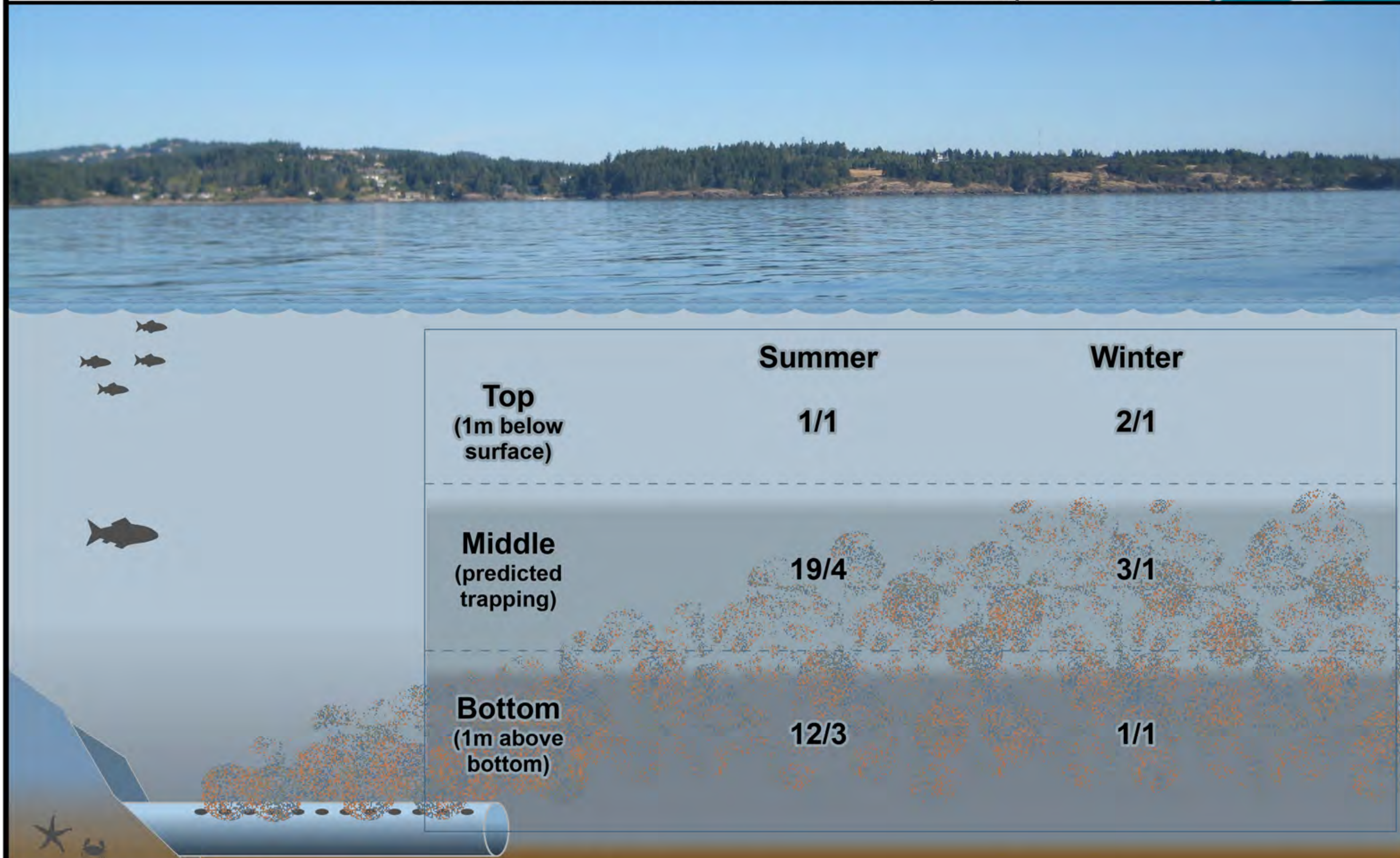
The extended suite of metals were analyzed at the four IDZ sites and a reference site on one day of sampling for each round of 5-in-30 sampling. Results are detailed in Appendix C2. For those parameters that were detected and had relevant BC and CCME WQG, only boron had WQG exceedances. Boron exceeded WQG at every station and every sampling event, including the reference station. This is a common occurrence, as the natural concentrations of boron are above WQG in the Salish Sea. ENV is working on updating the boron guideline.

CRD - Parks & Environmental Services - Facilities Management & Engineering Services - Apr 26, 2022 - Technologist: sruliancich - Map Document: SaanPenWaterColumn2021.mxd

CRD
Making a difference...together

Saanich Peninsula Waste Water Treatment Plant Water Column Sampling

Fecal Coliform and Enterococci Results - 2021 (5 in 30)



	Summer	Winter
Top (1m below surface)	1/1	2/1
Middle (predicted trapping)	19/4	3/1
Bottom (1m above bottom)	12/3	1/1

Fecal Coliform — **10/41** Saanich Peninsula Waste Water Treatment Plant IDZ station geometric means of fecal coliform and enterococci counts CFU/100mL (maximum concentrations).
Enterococci

Notes:

Each value is the geometric mean of each maximum value detected at each sampling event (i.e. n=5)
Sampled 5 times in 30 days during each season.
Geometric mean count shown in red if fecal count exceeds 200 CFU/100mL or enterococci count exceeds 20 CFU/100mL.

Table 5.1 SPTP Surface Sites 5 Sampling Events in 30 Days Fecal Coliform 2021

Site	Fecals	Winter						Summer					
		1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
Outfall Sites	Outfall	2	<1	10	<1	<1	1	1	<1	1	<1	<1	1
	100N	1	1	8	<1	1	1	<1	<1	1	<1	<1	1
	100S	32	<1	5	1	1	2	<1	<1	<1	<1	<1	1
	200NE	1	<1	2	<1	2	1	<1	<1	1	<1	<1	1
	200NW	4	<1	7	<1	<1	1	<1	<1	<1	<1	<1	1
	200SE	2	2	3	<1	2	2	<1	1	1	<1	<1	1
	200SW	1	<1	<1	<1	1	1	<1	<1	<1	<1	<1	1
	400E	2	<1	1	<1	<1	1	<1	<1	2	<1	<1	1
	400N	<1	<1	<1	<1	<1	1	<1	1	<1	<1	<1	1
	400S	<1	1	<1	<1	<1	1	1	<1	<1	<1	<1	1
	400W	2	<1	2	<1	<1	1	<1	2	<1	<1	<1	1
	800N	2	<1	1	<1	<1	1	1	2	<1	<1	<1	1
	800S	<1	<1	2	<1	<1	1	<1	<1	<1	<1	<1	1
	800W	<1	<1	3	<1	<1	1	<1	<1	<1	<1	<1	1
Reference Site	Reference 2	2	<1	<1	<1	<1	1	<1	<1	1	<1	<1	1

Notes:
Shaded cells exceed BC Approved WQG = 200 CFU/100 mL (geometric mean over 5 samples)
<1 replaced with 0.5 for Geomean calculation

Table 5.2 SPTP Surface Sites 5 Sampling Events in 30 Days Enterococci 2021

Site	Enterococci	Winter						Summer					
		1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
Outfall Sites	Outfall	1	<1	6	<1	<1	1	2	<1	<1	<1	<1	1
	100N	<1	<1	4	<1	<1	1	1	<1	<1	<1	<1	1
	100S	11	<1	6	<1	<1	2	<1	<1	<1	<1	<1	1
	200NE	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
	200NW	<1	<1	5	<1	1	1	<1	<1	<1	<1	<1	1
	200SE	<1	<1	3	<1	1	1	2	<1	<1	<1	<1	1
	200SW	<1	<1	<1	<1	<1	1	2	<1	1	<1	<1	1
	400E	1	<1	2	<1	<1	1	<1	<1	1	<1	<1	1
	400N	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
	400S	<1	<1	1	<1	<1	1	<1	1	<1	1	<1	1
	400W	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
	800N	<1	<1	<1	<1	<1	1	4	<1	<1	<1	<1	1
	800S	<1	<1	4	<1	<1	1	<1	<1	<1	<1	<1	1
	800W	<1	<1	2	<1	<1	1	7	<1	<1	<1	<1	1
Reference Site	Reference 2	<1	<1	1	<1	<1	1	<1	<1	<1	<1	<1	1

Notes:
Shaded cells exceed BC Approved WQG = 20 CFU/100 mL (geometric mean over 5 samples)
<1 replaced with 0.5 for Geomean calculation

Table 5.3 SPTP IDZ Sites 5 Sampling Events in 30 Days Fecal Coliform 2021

Fecals		Winter						Summer					
CFU/100 mL		Day 1	Day 2	Day 3	Day 4	Day 5	Geomean	Day 1	Day 2	Day 3	Day 4	Day 5	Geomean
Reference	Top	2	<1	<1	<1	<1	1	<1	<1	1	1	<1	1
	Middle	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1
	Bottom	1	<1	<1	<1	<1	1	1	<1	<1	1	2	1
Station 1	Top	1	<1	3	<1	1	1	<1	<1	3*	<1*	<1	1
	Middle	<1	9*	3	<1	1	1	<1	17*	1	18	1	3
	Bottom	8*	2*	<1	<1	<1	1	<1	<1	2	2*	3	1
Station 2	Top	<1	<1	14*	<1	1	1	<1	<1	1	<1	<1	1
	Middle	2*	1	8*	<1	1	2	51*	<1	1	24*	<1	3
	Bottom	<1	<1	<1	<1	<1	1	16	1*	1	1	20*	3
Station 3	Top	5*	<1	3	<1	<1	1	<1	<1	<1	<1	<1	1
	Middle	1	<1	<1	1*	<1	1	18	<1	110*	1	1	4
	Bottom	<1	<1	<1	<1	<1	1	53*	<1	2	1	1	2
Station 4	Top	2	<1*	1	<1*	<1	1	<1*	1*	<1	<1	5*	1
	Middle	1	1	<1	1	<1	1	<1	1	13	<1	1*	1
	Bottom	1	<1	<1*	1*	<1	1	45	<1	110*	1	2	5

Notes:
Shaded cells exceed BC Approved WQG = 200 CFU/100 mL (geometric mean over 5 samples)
<1 replaced with 0.5 for Geomean calculation
--- Indicates incomplete sampling due to adverse weather conditions
*Value used for max geomean calculations for Figure 5.2

Table 5.4 SPTP IDZ Sites 5 Sampling Events in 30 Days Enterococci 2021

Enterococci		Winter						Summer					
CFU/100 mL		Day 1	Day 2	Day 3	Day 4	Day 5	Geomean	Day 1	Day 2	Day 3	Day 4	Day 5	Geomean
Reference	Top	<1	<1	1	<1	<1	1	<1	<1	<1	<1	<1	1
	Middle	<1	<1	1	<1	1	1	<1	<1	<1	<1	<1	1
	Bottom	<1	<1	1	<1	<1	1	<1	<1	<1	<1	<1	1
Station 1	Top	1	<1*	<1	<1	<1	1	<1	<1*	<1	<1	<1*	1
	Middle	4*	<1*	2	<1	<1	1	<1	4*	<1	3*	<1	1
	Bottom	7*	<1*	<1	<1	<1	1	<1	<1	<1	<1*	<1	1
Station 2	Top	<1	<1	11*	<1	<1	1	<1	<1	<1	<1	<1	1
	Middle	<1	<1	5	<1	<1	1	6*	<1	<1	1	<1	1
	Bottom	<1	<1	<1	<1	<1	1	5	<1	<1	<1	4*	1
Station 3	Top	2*	<1	4	<1	<1	1	<1*	<1	<1	<1	<1	1
	Middle	<1	<1	4*	<1	<1	1	2	<1	28*	<1	<1	1
	Bottom	<1	<1	1*	1*	<1*	1	14*	<1	<1	<1	<1	1
Station 4	Top	1	<1	<1	<1*	<1*	1	<1	<1	<1*	<1*	<1	1
	Middle	<1	<1	1	1*	<1*	1	<1	<1	4	1	<1*	1
	Bottom	<1	<1	<1	<1	<1	1	7	<1*	19*	<1	<1	2

Notes:
Shaded cells exceed BC Approved WQG = 20 CFU/100 mL (geometric mean over 5 samples)
<1 replaced with 0.5 for Geomean calculation
--- Indicates incomplete sampling due to adverse weather conditions
*Value used for max geomean calculations for Figure 5.2

Nutrients

The potential effects of the SPTP discharge on nutrient concentrations in the marine receiving environment were assessed by qualitatively comparing the 2021 IDZ and reference station data. Data are presented in Appendix C3.

The 2021 mean concentrations of nutrients, and other measured parameters (i.e., ammonia, TKN, nitrite, nitrate, total phosphorus, dissolved phosphorus), exhibited no consistent (qualitative) differences between outfall and reference stations (Appendix C4). The average concentrations of nutrients in 2021 were also within the ranges measured during the pre- and post-discharge studies (Aquametrix Research Ltd., 2000 and 2001a), and were consistent with recent monitoring years and the concentrations expected in Juan de Fuca Strait. The average surface water result for nitrate was 0.28 mg/L N at the reference station and 0.26 mg/L N at the IDZ stations. For comparison, ambient nitrate concentrations in the Juan de Fuca Strait area are typically on the order of 0.140-0.420 mg/L N (Lewis, 1974 and 1978, as cited in Harrison *et al*., 1994).

Figure 5.3 and Figure 5.4 present 2013-2021 total nitrogen and nitrate results from the reference area and outfall monitoring stations, compared to the Mackas and Harrison (1997) study of background concentrations in the area. The comparison indicates that the monitoring results are well within background concentrations.

Similar to previous years (CRD, 2002-2020), nutrient concentrations in 2021 exhibited high natural spatial and temporal variability, which is typical of the Strait of Georgia and the Juan de Fuca and Haro straits (Mackas and Harrison, 1997). Nutrient concentrations are expected to vary due to seasonal physiochemical and biological cycles in marine waters. From autumn through spring, surface-layer nitrogen concentrations are generally high in the Strait of Georgia and Juan de Fuca and Haro straits because of reduced stratification, sustained tidal and wind mixing and low phytoplankton productivity. In summer, nitrogen concentrations are much lower, coinciding with low salinity and high temperatures influenced by surface water from the Fraser River freshet (Mackas and Harrison, 1997). Ammonia values show a seasonal variation, with total nitrogen and nitrate (Figure 5.3 and Figure 5.4, Appendix C3) lower in the summer and higher in the winter and TKN and nitrite (Appendix C3) higher in the summer and lower in the winter.

Nutrient monitoring results from 2002-2021 have shown no indication of potential for anthropogenic eutrophication due to the outfall. Mackas and Harrison (1997) indicate that the potential for eutrophication of the Strait of Georgia and Juan de Fuca and Haro straits is low for two reasons: first, high ambient nitrate and ammonia concentrations make total primary productivity relatively insensitive to moderate changes; second, the exchange of water by currents is rapid, and water entering the Strait of Georgia and Juan de Fuca Strait carries naturally high nutrient concentrations. Natural nitrogen inputs into the straits from estuarine circulation are estimated to be an order of magnitude higher than all anthropogenic and atmospheric inputs combined (Mackas and Harrison, 1997). SPTP outfall loadings of nitrogen-based nutrients to Bazan Bay were approximately 59 tonnes N/year in 2021 (Table 3.4; loadings of nitrate+nitrite+TKN, since TKN=organic N+ammonia); whereas, the net natural nitrogen input to the Juan de Fuca Strait/Strait of Georgia/Puget Sound estuarine system totals approximately 400-600 tonnes N/day (i.e., 146,000-219,000 tonnes N/year) (Mackas and Harrison, 1997).

Finally, Bazan Bay naturally contains 15-46 tonnes of nitrate alone, if one uses the typical ambient nitrate concentrations in the Juan de Fuca Strait area (0.140-0.420 mg/L N; Lewis 1974, 1978, as cited in Harrison *et al.*, 1994) and an assumed volume of 110,105,000 m^3 (volume calculated for the area enclosed by Sidney to James Island to Cordova Spit; Figure 5.1). Bazan Bay is also well flushed, as is evidenced by the fact that the 2021 surface water nitrate concentrations (Appendix C3) remained within the ambient Juan de Fuca nitrate concentrations, even though the SPTP outfall discharged approximately 47 kg of nitrate in 2021 (Table 3.4). Overall, the 2021 surface water data showed no evidence of any significant effect of the SPTP discharge on nutrients in the Bazan Bay receiving environment.

The conditions that could trigger the re-evaluation of the need for a comprehensive nutrient monitoring program (Section 5.1) were not applied to the 2021 data, as none of the triggers were met. Regardless, the program review with ENV has led to a revised SPTP WMEP, including the surface water monitoring program, which began in 2013. The nutrient component will soon be reviewed by the TWQRP as the review of the need for disinfection has been completed, as per Trigger #4, Section 5.1.

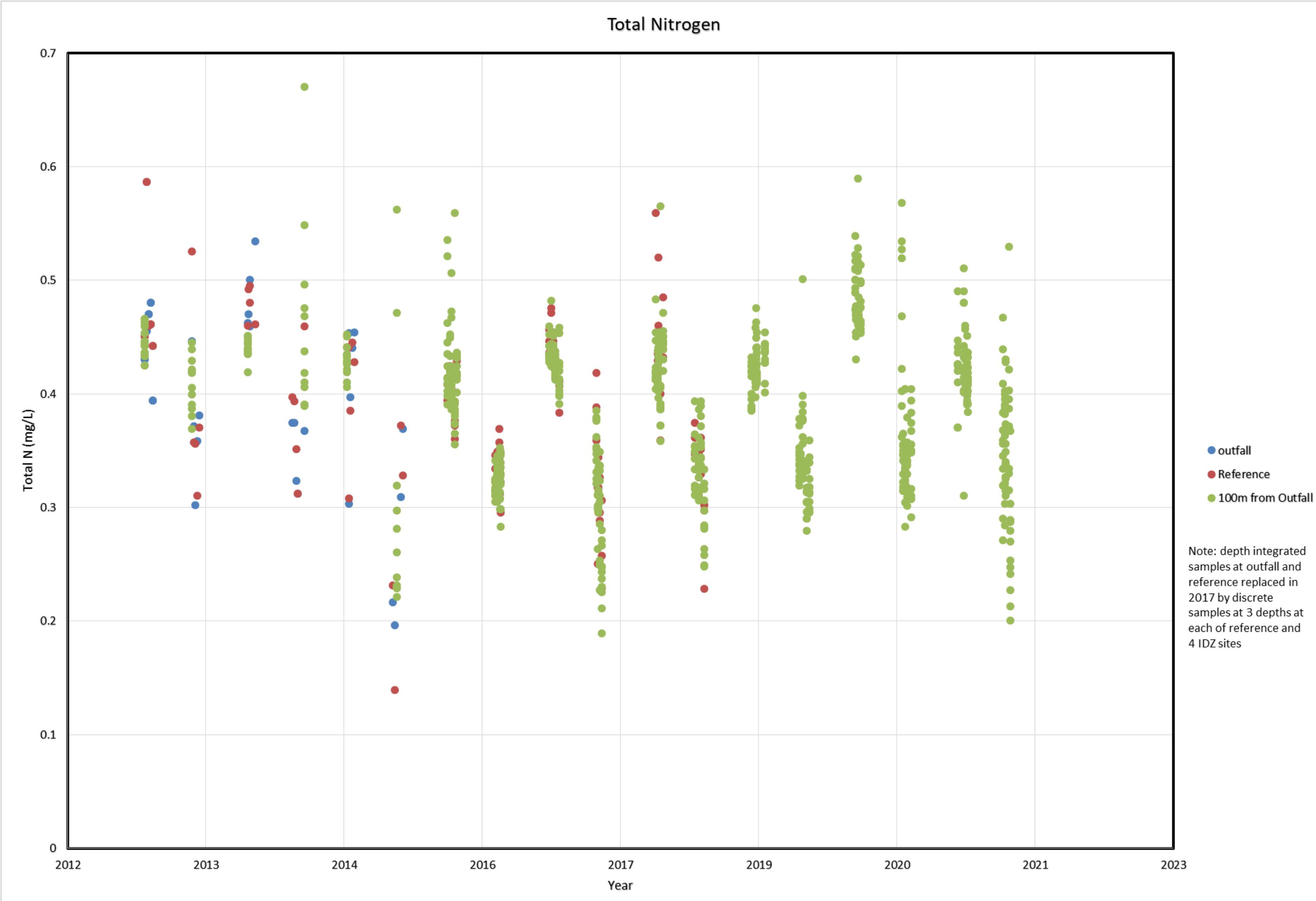


Figure 5.3 SPTP Total Nitrogen Sampling Results 2013-2021

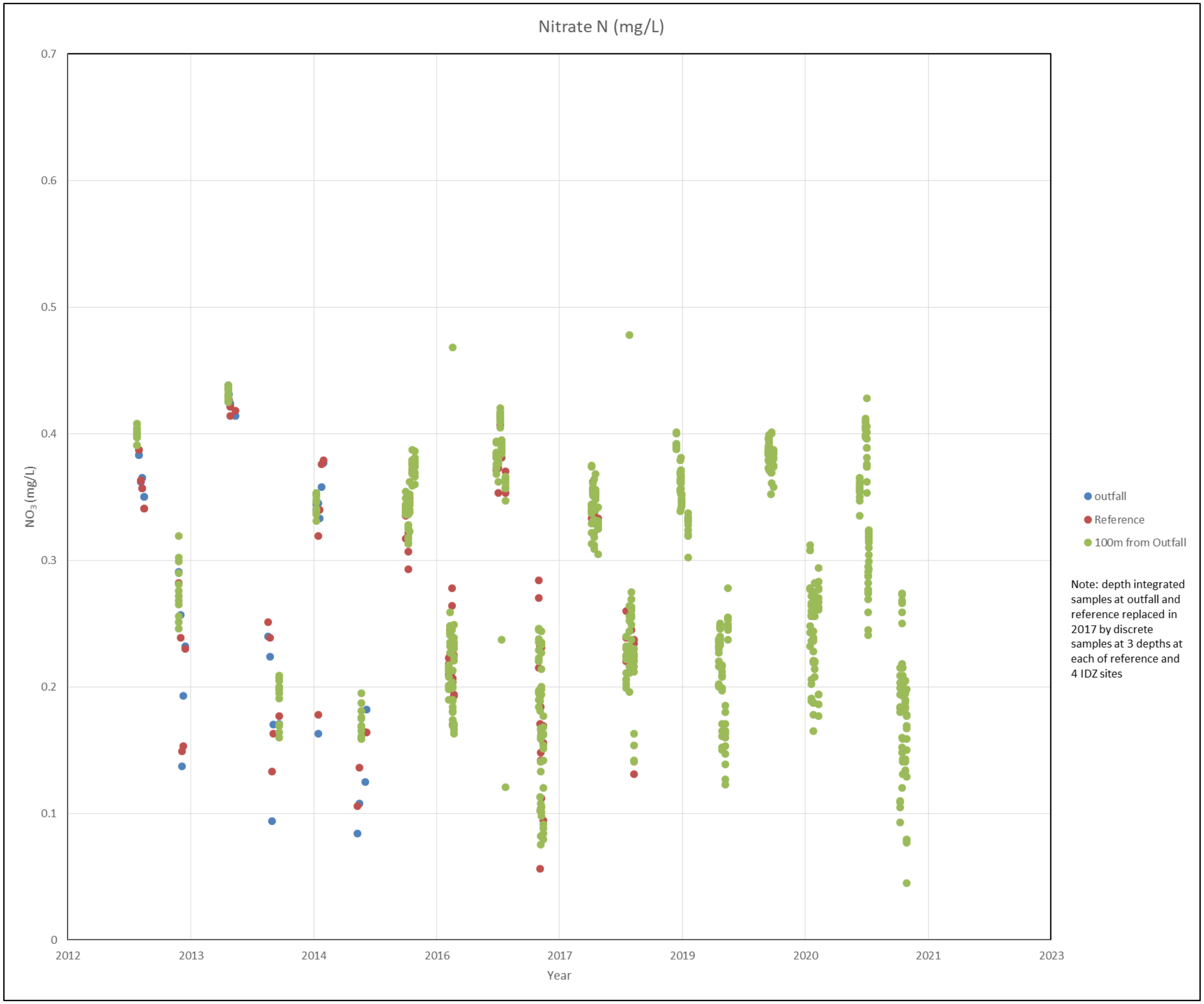


Figure 5.4 SPWTP Nitrate Sampling Results 2013-2021

5.4 Overall Assessment

Overall, the 2021 bacteriology results indicated that the outfall plume was predominantly trapped below the ocean surface. In addition, the potential for human exposure to high bacterial concentrations from the wastewater discharge was low around the outfalls, as demonstrated by geometric mean results that were below thresholds used to assess potential human health risks in surface waters. Effects on shellfish consumers were not expected. Most extended analyses monitoring parameters were either non-detect or well below applicable WQG, with the exception of boron, which exceeded WQG at every station and sampling event, including the reference station. The CRD will continue to monitor metals in waters around the outfall to assess environmental significance.

The 2021 nutrient results were consistent with previous years and there was no evidence of an effect on nutrient concentrations in the receiving environment from the SPTP discharge. There were no qualitative differences between the reference and IDZ stations, and results were within the ranges measured in previous years and ambient measurements throughout Juan de Fuca Strait and the Strait of Georgia.

6.0 SEAFLOOR MONITORING

The WMEP monitors the effects of the SPTP wastewater discharge on the seafloor at the end of the outfall once every four years. Seafloor sampling was last conducted in 2020 and will next be conducted in 2024. Results from the 2020 seafloor monitoring program are found in CRD (2021).

7.0 OVERALL CONCLUSIONS

Overall, the results of the WMEP monitoring conducted in 2021 did not indicate any significant negative effects from the SPTP discharge on the Bazan Bay receiving environment.

The CRD conducted wastewater monitoring on a regular basis to profile the chemical and physical constituents of influent and effluent. Influent and effluent quality was within expected ranges and met provincial and federal compliance requirements and treatment plant operational objectives, with the exception of the one high TSS result, which was likely an outlier due to material in the sample. All priority substances for which there are BC and Canadian WQG, met these guidelines after estimated minimum initial dilution of the effluent was factored in, with the exception of bacteriological indicators. This indicates that the substances measured in the effluent were not likely at concentrations high enough to be of concern to aquatic life after discharge to the marine environment.

Effluent toxicity testing resulted in no acute toxicity, and no chronic impairment to survival and reproductive endpoints.

No biosolids were generated in 2021 but monitoring of dewatered sludge was undertaken to inform the RSCP. Monitoring results of the SPTP sludge showed that all BC OMRR regulated parameters were far below Class A biosolids limits.

Surface water monitoring was used to assess the human and environmental effects of the SPTP discharge and to confirm the minimum initial dilution factor of 1:153 determined during the 2004 dye study. Results from 2021 showed that most stations had very low concentrations of fecal coliforms and enterococci, even though environmental concentrations were predicted to be higher, based on effluent bacterial concentrations and the 1:153 dilution factor. Bacterial station geometric means were 5 or less CFU/100 mL for all stations and depths in 2021 indicating adverse health effects from recreational primary contact activities or shellfish consumption were not expected.

Boron exceeded WQG at all IDZ stations, as well as at the reference station, and is naturally found at high levels in Bazan Bay.

There was some seasonality (winter vs. summer sampling events) observed in nutrient concentrations in 2021, but these were consistent between the outfall IDZ stations and the reference station. As was observed in previous monitoring years, high temporal and spatial variation was evident in the data. Monitoring results were within the ranges measured in previous monitoring years and in ambient samples collected throughout the Strait of Juan de Fuca and the Strait of Georgia. Overall, there was no evidence of nutrient enrichment in the receiving environment resulting from the SPTP discharge.

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APPENDIX A

Parameter List for the Saanich Peninsula Wastewater and Marine Environment Program 2021

Appendix A Parameter List for the Saanich Peninsula Wastewater and Marine Environment Program 2021

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
CONVENTIONAL VARIABLES				
alkalinity	minimum twice per week to monthly	√		
biochemical oxygen demand	influent - weekly; effluent - 3 times/week	√		
carbonaceous biochemical oxygen demand	minimum 2 times/week	√		
chemical oxygen demand	weekly	√		
chloride	1 time/month	√		
conductivity	4-5 times/month	√		√
cyanide (strong acid dissociable)		√		
cyanide (weak acid dissociable)		√		
fecal coliform	weekly	√	√	√
enterococci			√	√
hardness (as $CaCO_3$)		√		
hardness (as $CaCO_3$), dissolved		√		
ammonia	2-3 times/month	√	√	√
total Kjeldahl nitrogen	2-3 times/month	√	√	√
nitrate	2-3 times/month	√	√	√
nitrite	2-3 times/month	√	√	√
nitrogen, total		√	√	√
oil & grease, mineral		√		
oil & grease, total		√		
organic carbon, total		√	√	√
pH	daily	√	√	√
phosphate, dissolved	1 time/month		√	√
phosphate, total	1 time/month		√	√
salinity		√		√
sulphate		√		√
sulphide		√		√
suspended solids, total	daily	√		√
temperature		√		√

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
METALS TOTAL		√		
aluminum		√	√	
antimony		√	√	
arsenic		√	√	
barium		√	√	
beryllium		√	√	
bismuth			√	
cadmium		√	√	
calcium		√	√	
chromium		√	√	
chromium VI		√	√	
cobalt		√	√	
copper		√	√	
iron		√	√	
lead		√	√	
magnesium		√	√	
manganese		√	√	
mercury		√	√	
molybdenum		√	√	
nickel		√	√	
phosphorus		√	√	
potassium		√	√	
selenium		√	√	
silver		√	√	
sodium			√	
thallium		√	√	
tin		√	√	
zinc		√	√	

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
METALS - OTHER				
dibutyltin		√		
dibutyltin dichloride		√		
monobutyltin		√		
monobutyltin trichloride		√		
tributyltin		√		
tributyltin chloride		√		
methyl mercury		√		
METALS DISSOLVED				
aluminum		√		
antimony		√		
arsenic		√		
barium		√		
beryllium		√		
cadmium		√		
calcium		√		
chromium		√		
cobalt		√		
copper		√		
iron		√		
lead		√		
magnesium		√		
manganese		√		
mercury		√		
molybdenum		√		
nickel		√		
phosphorus		√		
potassium		√		
selenium		√		
silver		√		
thallium		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
tin		√		
zinc		√		
ALDEHYDES				
acrolein		√		
PHENOLIC COMPOUNDS				
total phenols		√		
2-chlorophenol		√		
2,4 & 2,5 -dichlorophenol		√		
2,4,6-trichlorophenol		√		
4-chloro-3-methylphenol		√		
pentachlorophenol		√		
2,4-dimethylphenol		√		
2,4-dinitrophenol		√		
2-methyl-4,6-dinitrophenol		√		
2-nitrophenol		√		
4-nitrophenol		√		
phenol		√		
2,4-DDD		√		
ORGANOCHLORINE PESTICIDES				
2,4-DDE		√		
2,4-DDT		√		
4,4-DDD		√		
4,4-DDE		√		
4,4-DDT		√		
aldrin		√		
alpha-chlordane		√		
alpha-endosulfan		√		
alpha-HCH		√		
beta-endosulfan		√		
beta-HCH		√		
chlordane		√		
delta-HCH		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
dieldrin		√		
endosulfan sulphate		√		
endrin		√		
endrin aldehyde		√		
gamma-chlordane		√		
gamma-HCH		√		
heptachlor		√		
heptachlor epoxide		√		
methoxyclor		√		
mirex		√		
octachlorostyrene		√		
total endosulfan		√		
toxaphene		√		
POLYCYCLIC AROMATIC HYDROCARBONS				
2-chloronaphthalene		√		
2-methylnaphthalene		√		
acenaphthene		√		
acenaphthylene		√		
anthracene		√		
benzo(a)anthracene		√		
benzo(a)pyrene		√		
benzo(b)fluoranthene		√		
benzo(g,h,i)perylene		√		
benzo(k)fluoranthene		√		
chrysene		√		
dibenzo(a,h)anthracene		√		
fluoranthene		√		
fluorene		√		
indeno(1,2,3-c,d)pyrene		√		
naphthalene		√		
phenanthrene		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
pyrene		√		
total high molecular weight – PAH		√		
total low molecular weight – PAH		√		
total PAH		√		
SEMIVOLATILE ORGANICS				
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		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
N-nitrosodi-n-propylamine		√		
N-nitrosodiphenylamine		√		
VOLATILE ORGANICS				
Monocyclic Aromatic Hydrocarbons				
1,2-dichlorobenzene		√		
1,3-dichlorobenzene		√		
1,4-dichlorobenzene		√		
1,2-dibromoethane		√		
1,4-dioxane		√		
4,6-dinitro-2-methylphenol		√		
benzene		√		
carbon tetrachloride		√		
chlorobenzene		√		
dichlorodifluoromethane		√		trichlo
ethylbenzene		√		
styrene		√		
toluene		√		
m & p xylenes		√		
o-xylene		√		
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		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
2-chloroethylvinyl ether		√		
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		√		
bromoform		√		
chlorodibromomethane		√		
tribromomethane		√		
trichloromethane		√		
vinyl Chloride		√		
Ketones				
4-methyl-2 pentanone		√		
dimethyl ketone		√		
endrin ketone		√		
methyl ethyl ketone		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
TERPENES				
alpha-terpineol		√		
TOXICITY				
acute toxicity	quarterly	√		
chronic toxicity	annually	√		
HIGH RESOLUTION ANALYSES				
Nonylphenols				
4-Nonylphenols		√		
4-Nonylphenol monoethoxylates		√		
4-Nonylphenol diethoxylates		√		
Octylphenol		√		
PAHs				
Naphthalene		√		
Acenaphthylene		√		
Acenaphthene		√		
Fluorene		√		
Phenanthrene		√		
Anthracene		√		
Fluoranthene		√		
Pyrene		√		
Benz[a]anthracene		√		
Chrysene		√		
Benzo[b]fluoranthene		√		
Benzo[j,k]fluoranthenes		√		
Benzo[e]pyrene		√		
Benzo[a]pyrene		√		
Perylene		√		
Dibenz[a,h]anthracene		√		
Indeno[1,2,3-cd]pyrene		√		
Benzo[ghi]perylene		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
2-Methylnaphthalene		√		
2,6-Dimethylnaphthalene		√		
2,3,5-Trimethylnaphthalene		√		
1-Methylphenanthrene		√		
Dibenzothiophene		√		
PBDEs		√**efluent only		
PCBs		√**efluent only		
Pesticides				
1,3-Dichlorobenzene		√**efluent only		
1,4-Dichlorobenzene		√**efluent only		
1,2-Dichlorobenzene		√**efluent only		
1,3,5-Trichlorobenzene		√**efluent only		
1,2,4-Trichlorobenzene		√**efluent only		
1,2,3-Trichlorobenzene		√**efluent only		
1,2,4,5-/1,2,3,5-Tetrachlorobenzene		√**efluent only		
1,2,3,4-Tetrachlorobenzene		√**efluent only		
Pentachlorobenzene		√**efluent only		
Hexachlorobutadiene		√**efluent only		
Hexachlorobenzene		√**efluent only		
HCH, alpha		√**efluent only		
HCH, beta		√**efluent only		
HCH, gamma		√**efluent only		
Heptachlor		√**efluent only		
Aldrin		√**efluent only		
Octachlorostyrene		√**efluent only		
Chlordane, oxy-		√**efluent only		
Chlordane, gamma (trans)		√**efluent only		
Chlordane, alpha (cis)		√**efluent only		
Nonachlor, trans-		√**efluent only		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
Nonachlor, cis-		√**efluent only		
2,4'-DDD		√**efluent only		
4,4'-DDD		√**efluent only		
2,4'-DDE		√**efluent only		
4,4'-DDE		√**efluent only		
2,4'-DDT		√**efluent only		
4,4'-DDT		√**efluent only		
Mirex		√**efluent only		
HCH, delta		√**efluent only		
Heptachlor Epoxide		√**efluent only		
alpha-Endosulphan		√**efluent only		
Dieldrin		√**efluent only		
Endrin		√**efluent only		
beta-Endosulphan		√**efluent only		
Endosulphan Sulphate		√**efluent only		
Endrin Aldehyde		√**efluent only		
Endrin Ketone		√**efluent only		
Methoxychlor		√**efluent only		
PFOS				
Perfluoroheptanoic Acid (PFHpA)		√		
Perfluorohexanoic Acid (PFHxA)		√		
Perfluorononanoic Acid (PFNA)		√		
Perfluorooctane Sulfonamide (PFOSA)		√		
Perfluorooctanesulfonic acid		√		
Perfluorooctanoic acid (PFOA)		√		
Perfluoropentanoic Acid (PFPeA)		√		
PFBS		√		
PFDoA		√		
PFHxS		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
PFUnA		√		
PCDD				
1,2,3,4,6,7,8-HPCDD		√		
1,2,3,4,6,7,8-HPCDF		√		
1,2,3,4,7,8,9-HPCDF		√		
1,2,3,4,7,8-HXCDD		√		
1,2,3,4,7,8-HXCDF		√		
1,2,3,6,7,8-HXCDD		√		
1,2,3,6,7,8-HXCDF		√		
1,2,3,7,8,9-HXCDD		√		
1,2,3,7,8,9-HXCDF		√		
1,2,3,7,8-PECDD		√		
1,2,3,7,8-PECDF		√		
2,3,4,6,7,8-HXCDF		√		
2,3,4,7,8-PECDF		√		
2,3,7,8-TCDD		√		
2,3,7,8-TCDF		√		
OCDD		√		
OCDF		√		
TOTAL HEPTA-DIOXINS		√		
TOTAL HEPTA-FURANS		√		
TOTAL HEXA-DIOXINS		√		
TOTAL HEXA-FURANS		√		
TOTAL PENTA-DIOXINS		√		
TOTAL PENTA-FURANS		√		
TOTAL TETRA-DIOXINS		√		
TOTAL TETRA-FURANS		√		
PPCPs				
2-Hydroxy-Ibuprofen		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
Acetaminophen		√		
Azithromycin		√		
Bisphenol A		√		
Caffeine		√		
Carbadox		√		
Carbamazepine		√		
Cefotaxime		√		
Ciprofloxacin		√		
Clarithromycin		√		
Clinafloxacin		√		
Cloxacillin		√		
Dehydronifedipine		√		
Digoxigenin		√		
Digoxin		√		
Diltiazem		√		
Diphenhydramine		√		
Enrofloxacin		√		
Erythromycin-H2O		√		
Flumequine		√		
Fluoxetine		√		
Furosemide		√		
Gemfibrozil		√		
Glipizide		√		
Glyburide		√		
Hydrochlorothiazide		√		
Ibuprofen		√		
Lincomycin		√		
Lomefloxacin		√		
Miconazole		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling frequency	Sampled quarterly (one day before and one day after quarterly)*	5 samples in 30 days (summer and winter) 1st day	5 samples in 30 days (summer and winter) 2nd-5th day
Naproxen		√		
Norfloxacin		√		
Norgestimate		√		
Ofloxacin		√		
Ormetoprim		√		
Oxacillin		√		
Oxolinic Acid		√		
Penicillin G		√		
Penicillin V		√		
Roxithromycin		√		
Sarafloxacin		√		
Sulfachloropyridazine		√		
Sulfadiazine		√		
Sulfadimethoxine		√		
Sulfamerazine		√		
Sulfamethazine		√		
Sulfamethizole		√		
Sulfamethoxazole		√		
Sulfanilamide		√		
Sulfathiazole		√		
Thiabendazole		√		
Triclocarban		√		
Triclosan		√		
Trimethoprim		√		
Tylosin		√		
Virginiamycin		√		
Warfarin		√		
PFAS		√		

APPENDIX B

Wastewater Monitoring

Appendix B1 Saanich Peninsula Treatment Plant Effluent Flow (m^3) in 2021

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	17,090	14,181	9,728	8,307	8,275	8,249	8,336	8,055	8,431	9,480	10,042	12,299
2	20,648	15,908	9,469	8,225	8,524	8,268	8,157	8,554	8,362	8,919	11,229	11,369
3	19,613	12,766	9,381	8,164	8,300	8,047	8,043	8,430	8,274	9,226	13,417	10,746
4	17,883	11,277	9,209	8,193	8,270	8,012	8,352	8,472	8,221	9,020	15,999	11,359
5	16,374	10,599	9,107	8,470	8,314	8,145	8,505	8,509	8,208	8,801	11,087	10,847
6	16,188	9,968	8,892	8,243	8,155	8,359	8,305	8,390	8,805	9,443	11,118	13,844
7	12,953	9,971	9,219	8,324	8,185	8,657	8,288	8,604	8,531	8,985	12,825	13,152
8	12,530	9,720	8,976	8,264	8,162	8,235	8,273	8,609	8,336	8,891	11,436	11,775
9	11,424	9,304	8,726	8,492	8,288	8,183	8,143	8,636	8,404	9,074	12,970	10,996
10	12,074	9,060	8,725	8,354	8,317	8,149	8,091	8,558	8,288	9,333	12,438	12,348
11	14,536	8,879	8,604	8,469	8,220	8,194	8,180	8,612	8,387	9,545	11,045	23,218
12	19,888	8,847	8,541	9,618	8,217	8,019	8,363	8,532	8,739	9,105	13,841	19,010
13	18,225	8,584	8,567	10,221	8,203	8,838	8,294	8,367	8,416	8,991	16,333	15,310
14	13,331	9,322	8,432	8,264	8,145	8,506	8,262	8,333	8,520	9,143	23,120	13,412
15	11,666	14,788	8,618	8,219	7,976	10,090	8,277	8,610	8,504	9,524	27,289	12,057
16	10,854	13,882	8,425	8,163	8,263	9,528	8,254	8,625	8,318	10,364	19,452	11,198
17	10,945	13,015	8,359	8,083	8,348	8,472	7,945	6,198	10,993	10,519	14,825	10,987
18	10,335	13,825	8,382	8,334	8,163	8,307	8,163	8,603	10,321	9,787	14,171	22,312
19	9,969	14,315	8,373	8,495	8,243	8,054	8,363	8,575	9,919	9,291	13,465	15,924
20	9,679	12,701	8,249	8,322	8,179	8,220	8,236	8,581	9,019	9,579	11,846	12,936
21	9,651	13,762	8,513	8,249	8,083	8,427	8,412	8,345	8,750	9,441	11,389	11,921
22	9,331	13,952	8,614	8,114	7,770	8,224	8,267	8,543	8,676	9,499	10,779	16,508
23	9,078	11,814	8,289	8,106	7,844	8,355	8,229	8,547	8,534	9,160	10,552	14,308
24	11,057	10,984	8,321	8,648	8,641	8,232	8,219	8,456	8,436	9,424	10,097	13,374
25	10,647	11,837	8,289	9,234	8,229	8,183	8,283	8,405	8,302	10,038	17,775	11,928
26	10,085	10,588	8,308	8,766	8,064	8,097	8,345	8,471	11,310	9,781	15,803	10,972
27	10,003	10,094	8,145	8,437	8,353	8,174	8,314	8,394	10,795	9,402	17,585	10,668
28	10,761	10,068	9,223	8,324	8,135	8,434	8,267	8,162	9,483	17,138	21,096	10,310
29	10,030	---	8,164	8,247	7,918	8,543	8,324	8,391	9,253	12,104	15,393	10,089
30	9,745	---	8,937	8,355	8,176	8,549	8,373	8,580	10,526	10,525	13,817	9,888
31	10,910	---	8,553	---	8,358	---	7,968	8,376	---	9,785	---	9,896
TOTAL Flow (m3/day)	397,503	324,011	269,338	253,704	254,318	251,750	255,831	260,523	269,061	303,317	432,234	404,961
Average	12,823	11,572	8,688	8,457	8,204	8,392	8,253	8,404	8,969	9,784	14,408	13,063
Maximum	20,648	15,908	9,728	10,221	8,641	10,090	8,505	8,636	11,310	17,138	27,289	23,218
Minimum	9,078	8,584	8,145	8,083	7,770	8,012	7,945	6,198	8,208	8,801	10,042	9,888
n	31	28	31	30	31	30	31	31	30	31	30	31
											Annual Average	**10,073**

Appendix B2 Compliance and Treatment Plant Performance Influent Results 2021

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH^3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
5-Jan	---	---	---	---	---	---	17	---	0.16	0.98	17	2.9	7.3	---	---
8-Jan	---	130	---	---	373	---	---	---	---	---	---	---	---	---	---
15-Jan	---	170	---	---	392	---	---	---	---	---	---	---	---	---	---
19-Jan	187	---	---	57	---	---	32	---	<0.005	<0.02	41	---	7.4	---	---
19-Jan	---	---	---	---	---	2,600,000	32	---	<0.002	---	---	6.3	7.8	---	---
20-Jan	---	270	270	59	597	1,900,000	39	0.07	<0.005	<0.02	36	5.1	7.8	6.8	210
21-Jan	---	---	---	---	---	2,600,000	37	---	<0.002	---	---	5.3	7.7	---	---
22-Jan	---	240	---	---	509	---	---	---	---	---	---	---	---	---	---
29-Jan	---	210	---	---	458	---	---	---	---	---	---	---	---	---	---
2-Feb	---	---	---	---	---	---	21	---	0.20	0.97	27	3.5	7.4	---	---
5-Feb	---	220	---	---	530	---	---	---	---	---	---	---	---	---	---
12-Feb	---	220	---	---	544	---	---	---	---	---	---	---	---	---	---
16-Feb	156	---	---	84	---	---	23	---	0.13	0.95	27	---	7.1	---	---
19-Feb	---	190	---	---	474	---	---	---	---	---	---	---	---	---	---
26-Feb	---	280	---	---	494	---	---	---	---	---	---	---	---	---	---
2-Mar	---	---	---	---	---	---	28	---	<0.005	<0.02	37	5.3	7.6	---	---
5-Mar	---	230	---	---	602	---	---	---	---	---	---	---	---	---	---
12-Mar	---	230	---	---	490	---	---	---	---	---	---	---	---	---	---
16-Mar	101	---	---	66	---	---	32	---	<0.0212	<0.02	51	---	7.1	---	---
19-Mar	---	250	---	---	599	---	---	---	---	---	---	---	---	---	---
26-Mar	---	170	---	---	622	---	---	---	---	---	---	---	---	---	---
31-Mar	---	160	---	---	473	---	---	---	---	---	---	---	---	---	---
6-Apr	---	---	---	---	---	---	35	---	<0.005	<0.02	56	5.2	7.4	---	---
9-Apr	---	302	---	---	648	---	---	---	---	---	---	---	---	---	---
15-Apr	---	250	240	61	650	4,300,000	39	<0.005	<0.05	<0.02	46	3.6	7.1	1.4	310
15-Apr	---	282	---	---	717	---	---	---	---	---	---	---	---	---	---
20-Apr	213	---	---	77	---	---	36	---	<0.005	<0.02	45	---	7.2	---	---
22-Apr	---	287	---	---	791	---	---	---	---	---	---	---	---	---	---
29-Apr	---	266	---	---	595	---	---	---	---	---	---	---	---	---	---
4-May	---	---	---	---	---	---	38	---	<0.005	<0.02	52	7.3	7.5	---	---
6-May	---	224	---	---	703	---	---	---	---	---	---	---	---	---	---
13-May	---	236	---	---	601	---	---	---	---	---	---	---	---	---	---
18-May	229	---	---	89	---	---	37	---	<0.005	<0.02	50	---	7.4	---	---
20-May	---	274	---	---	665	---	---	---	---	---	---	---	---	---	---
27-May	---	244	---	---	628	---	---	---	---	---	---	---	---	---	---
2-Jun	---	---	---	---	620	---	---	---	---	---	---	---	---	---	---
8-Jun	---	---	---	---	---	---	36	---	<0.005	<0.02	46	8.5	7.3	---	---

Appendix B2, continued

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH^3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10-Jun	---	280	---	---	714	---	---	---	---	---	---	---	---	---	---
17-Jun	---	294	---	---	642	---	---	---	---	---	---	---	---	---	---
22-Jun	245	---	---	82	---	---	39	---	<0.005	<0.02	51	---	7.3	---	---
24-Jun	---	247	---	---	576	---	---	---	---	---	---	---	---	---	---
29-Jun	---	204	---	---	670	---	---	---	---	---	---	---	---	---	---
6-Jul	---	---	---	---	---	---	37	---	<0.005	<0.02	49	7.3	7.2	---	---
8-Jul	---	335	---	---	847	---	---	---	---	---	---	---	---	---	---
14-Jul	---	---	---	---	---	8,800,000	44	---	<0.002	---	---	3.2	7.4	---	---
14-Jul	---	249	---	---	632	---	---	---	---	---	---	---	---	---	---
15-Jul	---	260	260	100	707	7,700,000	48	0.13	<0.005	<0.02	49	7.1	7.1	7.0	280
16-Jul	---	---	---	---	---	6,900,000	41	---	0.00	---	---	8.1	7.7	---	---
20-Jul	227	---	---	99	---	---	45	---	<0.005	<0.02	63	---	7.5	---	---
22-Jul	---	---	---	---	761	---	---	---	---	---	---	---	---	---	---
28-Jul	---	232	---	---	630	---	---	---	---	---	---	---	---	---	---
3-Aug	---	---	---	---	---	---	42	---	<0.005	<0.02	35	7.2	7.2	---	---
4-Aug	---	263	---	---	610	---	---	---	---	---	---	---	---	---	---
11-Aug	---	252	---	---	630	---	---	---	---	---	---	---	---	---	---
17-Aug	216	---	---	90	---	---	46	---	<0.05	<0.02	62	---	7.3	---	---
19-Aug	---	258	---	---	708	---	---	---	---	---	---	---	---	---	---
26-Aug	---	235	---	---	673	---	---	---	---	---	---	---	---	---	---
2-Sep	---	248	---	---	602	---	---	---	---	---	---	---	---	---	---
7-Sep	---	---	---	---	---	---	36	---	<0.05	<0.02	52	6.8	7.2	---	---
9-Sep	---	243	---	---	636	---	---	---	---	---	---	---	---	---	---
16-Sep	---	256	---	---	684	---	---	---	---	---	---	---	---	---	---
21-Sep	220	---	---	73	---	---	39	---	<0.005	<0.02	44	---	7.2	---	---
22-Sep	---	272	---	---	736	---	---	---	---	---	---	---	---	---	---
29-Sep	---	261	---	---	530	---	---	---	---	---	---	---	---	---	---
5-Oct	---	---	---	---	---	---	37	---	<0.005	<0.02	46	7.4	7.3	---	---
7-Oct	---	189	210	60	582	8,200,000	45	0.07	<0.005	<0.02	50	5.7	7.5	6.7	140
13-Oct	---	220	---	---	585	---	---	---	---	---	---	---	---	---	---
19-Oct	217	---	---	64	---	---	34	---	<0.05	<0.02	46	---	7.3	---	---
20-Oct	---	309	---	---	650	---	---	---	---	---	---	---	---	---	---
28-Oct	---	234	---	---	523	---	---	---	---	---	---	---	---	---	---
5-Oct	---	---	---	---	---	---	37	---	<0.005	<0.02	46	---	7.3	---	---
2-Nov	---	---	---	---	---	---	36	---	<0.05	<0.02	43	9.4	7.1	---	---
4-Nov	---	83	---	---	247	---	---	---	---	---	---	---	---	---	---
9-Nov	---	168	---	---	366	---	---	---	---	---	---	---	---	---	---
16-Nov	107	---	---	30	---	---	8	---	0.218	2.30	14	---	7.2	---	---

Appendix B2, continued

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH^3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
17-Nov	---	127	---	---	352	---	---	---	---	---	---	---	---	---	---
25-Nov	---	196	---	---	477	---	---	---	---	---	---	---	---	---	---
1-Dec	---	179	---	---	416	---	---	---	---	---	---	---	---	---	---
3-Dec	---	---	---	---	---	---	27	---	<0.005	<0.02	42	2.8	7.4	---	---
9-Dec	---	208	---	---	516	---	---	---	---	---	---	---	---	---	---
10-Dec	155	---	---	87	---	---	20	---	<0.005	0.03	29	---	7.4	---	---
14-Dec	---	183	---	---	459	---	---	---	---	---	---	---	---	---	---
18-Dec	---	142	---	---	325	---	---	---	---	---	---	---	---	---	---
23-Dec	---	170	---	---	426	---	---	---	---	---	---	---	---	---	---
30-Dec	---	179	---	---	416	---	---	---	---	---	---	---	---	---	---
Mean	189	228	245	74	575	5,375,000	34.6	0.1	0.028	0.19	43.1	5.9	7.4	5.5	235
Min	101	83	210	30	247	1,900,000	8	<0.005	<0.002	<0.02	14.3	2.8	7.06	1.41	140
Max	245	335	270	100	847	8,800,000	48	0.13	0.218	2.3	63.1	9.4	7.84	7.01	310
n	12	54	4	16	56	8	32	4	32	28	28	20	32	4	4

Notes: ALK-alkalinity, BOD-total biochemical oxygen demand, COD-chemical oxygen demand, CL-chloride, COND-conductivity, NH3-ammonia, UNION NH3-unionized ammonia
NO3-nitrate, NO2-nitrite, TDP-total dissolved phosphorus, TP-total phosphorous, TKN-total Kjeldahl nitrogen, CBOD- carbonaceous biochemical oxygen demand, TRC-total residual chlorine, TSS-total suspended solids

Appendix B3 Compliance and Treatment Plant Performance Effluent Results 2021

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
5-Jan	---	---	2	---	---	9,400	0.03	<0.0005	0.05	12	<0.2	1.2	7.2	6.7	0.02	5.6
7-Jan	---	6	3	---	---	---	---	---	---	---	---	---	---	---	---	---
8-Jan	---	6.1	2.6	---	50	---	---	---	---	---	---	---	---	---	---	---
14-Jan	---	5.5	2.8	---	---	---	---	---	---	---	---	---	---	---	---	---
15-Jan	---	5.6	3.1	---	40	---	---	---	---	---	---	---	---	---	---	---
19-Jan	31	---	2.9	59	---	85,000	0.05	<0.0005	0.03	14	2.15	---	7.2	6.7	0.02	4.4
19-Jan	---	---	---	---	---	100,000	0.03	---	0.03	---	---	4.0	7.2	---	---	---
20-Jan	---	11.0	5.0	---	---	---	---	---	---	---	---	---	---	---	---	---
20-Jan	---	7.3	4.0	57	34	82,000	0.03	<0.0005	0.03	14.0	0.3	2.5	6.7	6.5	---	4.8
21-Jan	---	---	---	---	---	72,000	0.04	---	0.04	---	---	2.7	7.2	---	---	---
22-Jan	---	8.5	3.9	---	24	---	---	---	---	---	---	---	---	---	---	---
28-Jan	---	6.8	3.9	---	---	---	---	---	---	---	---	---	---	---	---	---
29-Jan	---	5.1	2.5	---	<20	---	---	---	---	---	---	---	---	---	---	---
2-Feb	---	---	3.2	---	---	---	0.03	<0.0005	0.04	13.7	0.8	3.4	7.0	6.7	---	8.0
4-Feb	---	7	2	---	---	---	---	---	---	---	---	---	---	---	---	---
5-Feb	---	4.3	3	---	55	---	---	---	---	---	---	---	---	---	---	---
5-Feb	---	---	---	---	---	21,000	---	---	---	---	---	---	---	---	---	---
11-Feb	---	13.0	6	---	---	---	---	---	---	---	---	---	---	---	---	---
12-Feb	---	11.0	6	---	44	---	---	---	---	---	---	---	---	---	---	---
16-Feb	24	---	5	87	---	72,000	0.24	<0.0005	0.11	15.3	<0.4	---	6.7	6.4	---	6.4
18-Feb	---	5.4	<1	---	---	---	---	---	---	---	---	---	---	---	---	---
19-Feb	---	5.7	3.8	---	33	---	---	---	---	---	---	---	---	---	---	---
25-Feb	---	10.0	5.8	---	---	---	---	---	---	---	---	---	---	---	---	---
26-Feb	---	18.0	7.2	---	46	---	---	---	---	---	---	---	---	---	---	---
2-Mar	---	---	6.6	---	---	4,700	0.07	<0.0005	0.06	16.1	1.4	4.9	6.9	6.4	0.01	4.8
4-Mar	---	11.0	6.0	---	---	---	---	---	---	---	---	---	---	---	---	---
5-Mar	---	9.2	6.0	---	101	---	---	---	---	---	---	---	---	---	---	---
11-Mar	---	17.0	4.7	---	---	---	---	---	---	---	---	---	---	---	---	---
12-Mar	---	15.0	8.2	---	54	---	---	---	---	---	---	---	---	---	---	---
16-Mar	11	---	12.0	72	---	4,400	0.22	<0.0005	0.18	18.1	2.4	---	6.4	6.1	0.01	18.0
18-Mar	---	18.0	8.0	---	---	---	---	---	---	---	---	---	---	---	---	---
19-Mar	---	22.0	11.0	---	69	---	---	---	---	---	---	---	---	---	---	---
25-Mar	---	35.0	15.0	---	---	---	---	---	---	---	---	---	---	---	---	---
26-Mar	---	31.0	9.1	---	70	---	---	---	---	---	---	---	---	---	---	---
30-Mar	---	37.0	12.0	---	---	---	---	---	---	---	---	---	---	---	---	---
31-Mar	---	24.0	4.9	---	73	---	---	---	---	---	---	---	---	---	---	---

Appendix B3, continued

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
6-Apr	---	---	11.0	---	---	44,000	8.50	0.01	0.86	16.3	11.8	2.6	7.1	6.8	0.02	9.2
8-Apr	---	>20	7.6	---	---	---	---	---	---	---	---	---	---	---	---	---
9-Apr	---	---	>20	---	67	---	---	---	---	---	---	---	---	---	---	---
14-Apr	---	45.8	9.3	---	---	---	---	---	---	---	---	---	---	---	---	---
15-Apr	---	29.0	8.3	62	60	200,000	5.50	<0.0005	3.00	12.1	4.6	3.6	6.9	1.5	---	10.0
15-Apr	---	36.0	13.0	64	76	98,000	4.20	<0.0005	2.85	12.6	3.8	3.2	6.8	1.4	---	13.0
15-Apr	---	34.0	9	63	68	110,000	5.30	<0.0005	3.11	12.2	4.4	3.6	6.9	1.4	---	14.0
15-Apr	---	43.2	13	---	61	---	---	---	---	---	---	---	---	---	---	---
20-Apr	38	---	13.0	74	---	270,000	3.70	0.002	2.87	10.9	5.3	---	6.7	6.2	0.02	18.0
21-Apr	---	47.1	8.1	---	---	---	---	---	---	---	---	---	---	---	---	---
22-Apr	---	42.7	<6.5	---	41	---	---	---	---	---	---	---	---	---	---	---
28-Apr	---	26.9	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
29-Apr	---	32.5	<6.5	---	56	---	---	---	---	---	---	---	---	---	---	---
4-May	---	---	11.0	---	---	23,000	1.10	0.001	1.39	12.9	3.2	1.8	7.2	6.6	---	5.6
5-May	---	20.5	<6.5	---	62	---	---	---	---	---	---	---	---	---	---	---
6-May	---	24.4	7.0	---	---	---	---	---	---	---	---	---	---	---	---	---
12-May	---	14.9	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
13-May	---	18.2	<6.5	---	58	---	---	---	---	---	---	---	---	---	---	---
18-May	42	---	13.0	86	---	47,000	2.70	0.006	0.71	14.8	5.1	---	6.9	6.9	0.30	81.0
19-May	---	13.8	7.6	---	---	---	---	---	---	---	---	---	---	---	---	---
20-May	---	28.4	4.5	---	66	---	---	---	---	---	---	---	---	---	---	---
26-May	---	16.0	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
27-May	---	12.3	<6.5	---	50	---	---	---	---	---	---	---	---	---	---	---
1-Jun	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2-Jun	---	---	---	---	49	---	---	---	---	---	---	---	---	---	---	---
8-Jun	---	---	6.3	---	---	15,000	0.86	0.002	0.75	16.2	2.1	2.3	6.8	6.9	---	12.0
9-Jun	---	13.0	4.5	---	---	---	---	---	---	---	---	---	---	---	---	---
10-Jun	---	12.0	5.8	---	59	---	---	---	---	---	---	---	---	---	---	---
16-Jun	---	19.0	8.0	---	---	---	---	---	---	---	---	---	---	---	---	---
17-Jun	---	20.3	<6.5	---	75	---	---	---	---	---	---	---	---	---	---	---
22-Jun	27	---	16.0	80	---	200,000	0.82	0.001	0.46	17.5	3.8	---	6.7	6.8	---	31.0
23-Jun	---	22.6	10.8	---	---	---	---	---	---	---	---	---	---	---	---	---
24-Jun	---	27.6	7.1	---	74	---	---	---	---	---	---	---	---	---	---	---
28-Jun	---	5.1	2.6	---	---	---	---	---	---	---	---	---	---	---	---	---
29-Jun	---	25.9	6.5	---	70	---	---	---	---	---	---	---	---	---	---	---
6-Jul	---	---	3.3	---	---	70,000	2.60	0.003	0.72	16.7	3.8	3.7	6.8	6.6	---	12.0
7-Jul	---	9.1	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix B3, continued

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
8-Jul	---	8.0	<6.5	---	62	---	---	---	---	---	---	---	---	---	---	---
13-Jul	---	13.4	4.5	---	---	---	---	---	---	---	---	---	---	---	---	---
14-Jul	---	---	---	---	---	100,000	7.10	---	3.13	---	---	7.5	7.2	---	---	---
14-Jul	---	13.4	<6.5	---	54	---	---	---	---	---	---	---	---	---	---	---
15-Jul	---	27.0	12.0	88	70	110,000	7.40	0.020	3.29	11.2	5.5	3.3	6.9	7.0	---	18.0
16-Jul	---	---	---	---	---	60,000	7.30	---	4.36	---	---	3.0	7.5	---	---	---
20-Jul	58	---	7.6	92	---	260,000	6.60	0.032	6.40	9.4	8.7	---	7.4	7.3	0.01	14.0
21-Jul	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22-Jul	---	---	---	---	79	---	---	---	---	---	---	---	---	---	---	---
27-Jul	---	14.0	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
28-Jul	---	21.6	<6.5	---	100	---	---	---	---	---	---	---	---	---	---	---
3-Aug	---	---	11.0	---	---	460,000	5.60	0.021	6.34	8.9	5.5	2.1	7.2	7.1	---	18.0
3-Aug	---	16.5	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
4-Aug	---	18.4	<6.5	---	74	---	---	---	---	---	---	---	---	---	---	---
10-Aug	---	15.9	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
11-Aug	---	17.5	<6.5	---	74	---	---	---	---	---	---	---	---	---	---	---
17-Aug	51	---	11.0	89	---	37,000	4.00	0.011	5.44	8.7	6.7	---	7.2	7.0	0.16	12.0
18-Aug	---	15.1	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
19-Aug	---	19.1	<6.5	---	77	---	---	---	---	---	---	---	---	---	---	---
25-Aug	---	15.0	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
26-Aug	---	15.0	<6.5	---	75	---	---	---	---	---	---	---	---	---	---	---
1-Sep	---	17.2	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
2-Sep	---	15.6	11.4	---	77	---	---	---	---	---	---	---	---	---	---	---
7-Sep	---	---	8.6	---	---	67,000	7.30	0.028	1.82	15.6	10.4	2.5	7.2	7.1	---	20.0
8-Sep	---	13.7	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
9-Sep	---	14.4	<6.5	---	76	---	---	---	---	---	---	---	---	---	---	---
15-Sep	---	19.0	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
16-Sep	---	13.8	<6.5	---	57	---	---	---	---	---	---	---	---	---	---	---
21-Sep	35	---	3.9	69	---	59,000	2.50	0.005	4.84	11.2	4.2	---	6.9	6.9	0.07	15.0
22-Sep	---	24.8	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
22-Sep	---	20.2	<6.5	---	68	---	---	---	---	---	---	---	---	---	---	---
28-Sep	---	15.2	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
29-Sep	---	15.4	<6.5	---	295	---	---	---	---	---	---	---	---	---	---	---
5-Oct	---	---	11.0	---	---	46,000	2.00	0.003	4.45	11.6	4.0	1.6	7.1	6.7	0.02	<1
6-Oct	---	15.8	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
7-Oct	---	17.0	2.6	64	41	10,000	1.50	0.002	4.88	11.0	2.1	1.8	6.8	6.7	---	5.2
7-Oct	---	16.8	<6.5	---	46	---	---	---	---	---	---	---	---	---	---	---

Appendix B3, continued

Date 2021	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
12-Oct	---	18.3	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
13-Oct	---	17.3	<6.5	---	42	---	---	---	---	---	---	---	---	---	---	---
19-Oct	39	---	6.1	68	---	34,000	1.60	0.002	3.14	12.9	2.8	---	7.1	6.8	0.02	11.0
19-Oct	---	12.3	<6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
20-Oct	---	18.0	<6.5	---	44	---	---	---	---	---	---	---	---	---	---	---
27-Oct	---	13.5	3.7	---	---	---	---	---	---	---	---	---	---	---	---	---
28-Oct	---	19.7	4.5	---	54	---	---	---	---	---	---	---	---	---	---	---
2-Nov	---	---	8.1	---	---	29,000	3.00	0.004	2.35	13.1	4.7	3.1	6.9	6.7	0.03	31.0
3-Nov	---	15.3	4.9	---	---	---	---	---	---	---	---	---	---	---	---	---
4-Nov	---	15.3	3.6	---	63	---	---	---	---	---	---	---	---	---	---	---
8-Nov	---	13.6	3.7	---	---	---	---	---	---	---	---	---	---	---	---	---
9-Nov	---	7.0	<2.82	---	46	---	---	---	---	---	---	---	---	---	---	---
16-Nov	39	---	5.4	19	---	4,400	0.04	<0.0005	0.49	5.6	0.8	---	7.2	6.7	0.03	14.0
16-Nov	---	7.1	<3.48	---	---	---	---	---	---	---	---	---	---	---	---	---
17-Nov	---	6.1	<3.48	---	39	---	---	---	---	---	---	---	---	---	---	---
24-Nov	---	7.9	<2	---	---	---	---	---	---	---	---	---	---	---	---	---
25-Nov	---	9.6	2.7	---	54	---	---	---	---	---	---	---	---	---	---	---
1-Dec	---	7.4	<2.83	---	---	---	---	---	---	---	---	---	---	---	---	---
2-Dec	---	7.9	<3.23	---	55	---	---	---	---	---	---	---	---	---	---	---
7-Dec	---	---	3.7	---	---	38,000	0.11	<0.0005	0.38	15.8	0.3	2.8	7.0	6.6	0.03	5.2
7-Dec	---	5.9	3.2	---	---	---	---	---	---	---	---	---	---	---	---	---
8-Dec	---	16.2	6.6	---	63	---	---	---	---	---	---	---	---	---	---	---
14-Dec	42	---	6.1	52	---	12,000	0.05	<0.0005	<0.05	12.2	0.6	---	7.2	6.4	0.05	6.8
14-Dec	---	6.6	2.6	---	---	---	---	---	---	---	---	---	---	---	---	---
15-Dec	---	12.2	3.7	---	40	---	---	---	---	---	---	---	---	---	---	---
22-Dec	---	7.3	<3.14	---	---	---	---	---	---	---	---	---	---	---	---	---
23-Dec	---	7.2	3.2	---	42	---	---	---	---	---	---	---	---	---	---	---
29-Dec	---	8.7	3.7	---	---	---	---	---	---	---	---	---	---	---	---	---
30-Dec	---	14.2	4.5	---	44	---	---	---	---	---	---	---	---	---	---	---
Mean	36.3	16.5	5.3	69.2	62.2	83,938	2.7	0.005	2.0	13.1	3.7	3.1	7.0	6.2	0.1	14.3
Min	10.7	4.3	<1	19.0	<20	4,400	0.025	<0.0005	<0.05	5.6	<0.02	1.2	6.4	1.4	0.010	<1
Max	58	47	16	92	295	460,000	9	0.032	6	18	12	8	7	7	0.30	81
n	12	104	129	18	58	34	34	30	34	30	30	22	34	30	16	30

Notes: ALK-alkalinity, BOD-total biochemical oxygen demand, COD-chemical oxygen demand, CL-chloride, COND-conductivity, NH3-ammonia, union NH3-unionized ammonia, NO3-nitrate, NO2-nitrite, TDP-total dissolved phosphorus, TP-total phosphorous, TKN-total Kjeldahl nitrogen, CBOD- carbonaceous biochemical oxygen demand, UN NH3-unionized ammonia, TRC-total residual chlorine, TSS-total suspended solids. Shaded value indicates exceedance to permitted maximum.

Appendix B4 Influent and Effluent Priority Substance Concentrations 2021

			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
Parameter			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Enterococci	TOT	CFU/100 mL	330,000	34,000	380,000	4,200	450,000	24,000	2,500,000	52,000	1,100,000	14,000	1,100,000	2,200	1,000,000	8,000	300,000	3,000
Fecal Coliforms	TOT	CFU/100 mL	2,600,000	100,000	1,900,000	82,000	2,600,000	72,000	4,300,000	200,000	8,800,000	100,000	7,700,000	110,000	6,900,000	60,000	8,200,000	10,000
Alkalinity - Total - Ph 4.5	TOT	mg/L	---	---	220	51	---	---	220	38	---	---	240	61	---	---	220	38
Chloride	DIS	mg/L	---	---	59	58	---	---	61	64	---	---	100	88	---	---	60	64
Total/SAD Cyanide	TOT	mg/L	0.0017	0.00153	0.00171	0.00145	0.00213	0.00148	0.00276	0.00256	0.00181	0.0023	0.00128	0.00319	0.00242	0.00295	0.00205	0.00199
WAD Cyanide	TOT	mg/L	0.00119	0.00082	0.00089	0.00109	0.0009	0.00103	0.00107	0.00138	0.0007	0.00118	0.00097	0.0025	0.00102	0.00094	0.00072	0.00105
Alkalinity - Bicarbonate	TOT	mg/L	---	---	270	62	---	---	270	46	---	---	290	75	---	---	260	46
Alkalinity - Carbonate	TOT	mg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Alkalinity - Hydroxide	TOT	mg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Alkalinity - Phenolphthalein - Ph 8.3	TOT	mg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Hardness (as CaCO3)	DIS	mg/L	73	78.4	67	73.9	64.5	72.4	58.4	67.1	74.5	80.6	76.6	74.2	71.3	77.6	65.5	69.3
Hardness (as CaCO3)	TOT	mg/L	86.4	82	75.8	72.3	77.9	72.5	67.9	68.8	82.8	86.9	91.5	78.3	87	81	70	65.7
Sulphate	DIS	mg/L	---	---	23	27	---	---	22	28	---	---	23	33	---	---	20	29
N - NH3 (As N)	TOT	mg/L	32	0.025	39	0.025	37	0.044	39	5.5	44	7.1	48	7.4	41	7.3	45	1.5
N - NH3 (As N)- Unionized	TOT	mg/L	---	---	0.065	<0.0005	---	---	<0.0005	<0.0005	---	---	0.13	0.02	---	---	0.068	0.0019
N - NO2 (As N)	TOT	mg/L	<0.002	0.029	<0.005	0.0293	<0.002	0.0362	<0.05	3.11	<0.002	3.13	<0.005	3.29	0.0024	4.36	<0.005	4.88
N - NO3 (As N)	TOT	mg/L	---	---	<0.02	14	---	---	<0.2	12.6	---	---	<0.02	11.2	---	---	<0.02	11
N - No3 + No2 (As N)	TOT	mg/L	---	---	<0.02	14	---	---	<0.2	15.4	---	---	<0.02	14.5	---	---	<0.02	15.9
N - TKN (As N)	TOT	mg/L	---	---	35.5	0.28	---	---	45.7	4.64	---	---	49.1	5.48	---	---	50.3	2.12
N - Total (As N)	TOT	mg/L	---	---	35.5	14.3	---	---	45.7	19.7	---	---	49.1	19.9	---	---	50.3	18
P - PO4 - Ortho (As P)	DIS	mg/L	---	---	3.6	2.5	---	---	3.8	2.8	---	---	4.7	2.4	---	---	3.8	1.7
P – PO4 - Total (As P)	TOT	µg/L	6,280	3,960	5,120	2,500	5,280	2,720	3,560	3,600	3,230	7,540	7,090	3,260	8,050	2,960	5,720	1,840
Total Organic Carbon	TOT	mg/L	---	---	44	11	---	---	46	12	---	---	55	14	---	---	37	11
Oil & Grease, Mineral	TOT	mg/L	<2	<2	<2	<2	<2	<2	2.9	<2	<2	<2	3.6	<2	<2	<2	<2	<2
Oil & grease, Total	TOT	mg/L	16	<1	17	<1	15	<1	18	<1	15	<1	34	<1	14	<1	5	<1
BOD	TOT	mg/L	---	---	270	7.3	---	---	250	36	---	---	260	27	---	---	170	17
CBOD	TOT	mg/L	---	---	270	4	---	---	240	13	---	---	260	12	---	---	210	2.6
COD	TOT	mg/L	---	---	597	34	---	---	650	76	---	---	716	70	---	---	582	41
pH	TOT	pH	7.75	7.17	7.84	6.74	7.69	7.18	7.11	6.9	7.4	7.21	7.06	6.94	7.72	7.46	7.48	6.75
pH @ 15° C	TOT	pH	---	---	6.78	6.54	---	---	1.41	1.45	---	---	7.01	6.98	---	---	6.74	6.65
Temperature	TOT	°C	11.8	11.7	13	12.5	12.1	11.5	---	---	---	---	---	---	---	---	18.2	18
Total suspended solids (TSS)	TOT	mg/L	---	---	210	4.8	---	---	310	14	---	---	280	18	---	---	140	5.2
Sulfide	TOT	mg/L	0.28	0.015	0.52	0.019	0.24	0.019	0.97	0.016	2	0.025	3.5	0.017	2.2	0.011	---	---
Tetrabromomethane	NA	µg/L	---	---	<50	---	---	---	<50	<50	---	---	---	---	---	---	---	---
Tetrabromomethane	TOT	µg/L	---	---	---	<50	---	---	---	---	---	---	<50	<50	---	---	<50	<50
4-Methyl-2-Pentanone	TOT	µg/L	---	---	<10	<10	---	---	<10	<10	---	---	<10	<10	---	---	<10	<10
Dimethyl Ketone	TOT	µg/L	---	---	29	<15	---	---	31	31	---	---	94	19	---	---	36	21
Endrin Ketone	TOT	ng/L	---	---	---	<0.109	---	---	<0.112	<0.131	---	---	---	<0.16	---	---	---	<0.235
Isophorone	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Aluminum	DIS	µg/L	25	11.8	23.3	9.6	23.5	9.57	27.1	19.4	32.5	12.2	24	12.9	31.2	12.5	37.9	12.4
Antimony	DIS	µg/L	0.222	0.23	0.187	0.212	0.21	0.192	0.252	0.252	0.282	0.299	0.231	0.251	0.304	0.264	0.145	0.22
Arsenic	DIS	µg/L	0.286	0.233	0.272	0.182	0.294	0.186	0.301	0.203	0.404	0.259	0.302	0.205	0.345	0.25	0.321	0.215
Barium	DIS	µg/L	6.28	7.03	5.89	6.39	5.81	6.36	5.31	5.92	8.53	7.27	8.45	6.88	8.3	7.4	11	6.93
Beryllium	DIS	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	DIS	µg/L	0.0255	0.0529	0.0201	0.045	0.0286	0.0426	0.0237	0.0264	0.0569	0.0224	0.0475	0.0532	0.0633	0.0156	0.0231	0.0068
Calcium	DIS	mg/L	17	18.8	15.9	18	15.3	17.7	13.4	16.7	17.7	20.8	18.9	18.9	17.3	19.8	16	18.3
Chromium	DIS	µg/L	0.64	0.52	0.93	0.62	0.57	0.6	0.65	0.55	1.11	0.77	0.82	0.65	0.97	0.8	0.94	0.48
Cobalt	DIS	µg/L	0.326	0.226	0.3	0.234	0.327	0.24	0.272	0.284	0.33	0.282	0.273	0.254	0.285	0.239	0.307	0.218
Copper	DIS	µg/L	56.9	24.5	57.2	17.2	58.3	15.9	27	11.2	37.1	12.2	30.4	11.3	34.1	12.1	19.6	6.57
Iron	DIS	µg/L	178	42.2	178	45	147	42.1	294	134	296	106	224	108	274	121	352	90.7

Appendix B4, cont'd

			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
Parameter			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Lead	DIS	µg/L	0.761	0.36	0.697	0.328	0.862	0.338	0.606	0.506	0.905	0.511	0.689	0.435	0.875	0.451	0.544	0.29
Magnesium	DIS	mg/L	7.42	7.66	6.64	7	6.39	6.84	6.07	6.16	7.35	6.96	7.16	6.58	6.85	6.86	6.21	5.75
Manganese	DIS	µg/L	35.7	26.6	32.3	27.4	33.4	28.3	23.6	32.1	30.7	33	28.1	31.8	28.9	32.1	33.6	19.2
Mercury	DIS	µg/L	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	0.0046	<0.0019	<0.038	<0.038	<0.038	<0.038	<0.038	<0.038	<0.038	<0.0019
Molybdenum	DIS	µg/L	2.35	1.13	2.14	1.75	3.72	2.3	1.76	2.51	0.568	0.512	0.539	0.429	0.956	0.714	1.15	0.942
Nickel	DIS	µg/L	1.66	1.4	1.81	1.43	1.87	1.43	2.07	2.08	2.43	1.69	2.01	1.6	2.12	1.61	3.12	2.58
Phosphorus	DIS	µg/L	3420	3730	3650	2580	3590	2750	4330	3320	5040	2550	4960	2770	4950	2410	5200	1840
Potassium	DIS	mg/L	12.9	12.1	13.7	11.8	13.5	11.8	14.9	15	17.5	16.2	16.2	14.9	17	16.2	14.9	14.9
Selenium	DIS	µg/L	0.217	0.155	0.218	0.125	0.219	0.14	0.239	0.211	0.24	0.241	0.183	0.188	0.267	0.185	0.127	0.135
Silver	DIS	µg/L	0.0396	<0.005	0.0399	0.0069	0.0473	0.0063	0.0369	0.0092	0.0611	0.0191	0.112	0.0132	0.0474	0.0172	0.0312	<0.005
Thallium	DIS	µg/L	0.003	0.0023	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0046	0.0044	<0.002	<0.002	0.0112	0.0031	<0.002	<0.002
Tin	DIS	µg/L	0.73	0.36	0.7	0.37	0.74	0.37	0.83	0.6	1.08	0.73	0.92	0.66	0.98	0.69	0.78	0.57
Zinc	DIS	µg/L	31.4	44.2	31.5	42.8	35.5	42.7	33.7	47.5	27.8	36.8	23.8	31.2	24.3	30	12.3	24.7
Aluminum	TOT	µg/L	388	30.1	169	14.7	221	18.2	27.3	27.3	30.9	286	244	23.8	311	22.2	227	19.1
Antimony	TOT	µg/L	0.385	0.242	0.181	0.207	0.189	0.191	0.267	0.267	0.304	0.616	0.351	0.279	0.814	0.28	0.123	0.209
Arsenic	TOT	µg/L	0.44	0.244	0.326	0.183	0.343	0.174	0.221	0.221	0.288	0.512	0.428	0.254	0.483	0.225	0.428	0.213
Barium	TOT	µg/L	20.3	7.36	13.7	6.29	24.5	6.45	6.21	6.33	8.14	20.4	21.6	7.91	26.3	8.78	17.9	6.82
Beryllium	TOT	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	TOT	µg/L	0.159	0.0503	0.112	0.0459	0.13	0.046	0.067	0.067	0.0324	0.267	0.289	0.0358	0.315	0.028	0.156	0.0058
Calcium	TOT	mg/L	20.8	19.7	18.5	17.7	19.2	17.7	17.2	17.2	21.1	22	23.7	19.8	22.5	20.8	18	17.5
Chromium	TOT	µg/L	2.25	0.59	1.68	0.62	1.32	0.61	0.66	0.66	0.8	2.56	1.6	0.82	2.46	0.9	2.11	0.41
Chromium Iii	TOT	mg/L	0.0023	<0.00099	0.0017	<0.00099	0.0013	<0.00099	<0.00099	<0.00099	<0.0099	<0.00099	<0.0099	<0.00099	<0.0099	<0.00099	---	---
Chromium Vi	TOT	mg/L	<0.00099	<0.00099	<0.00099	<0.00099	<0.00099	<0.00099	<0.00099	0.0031	0.016	0.0096	<0.0099	0.015	<0.0099	<0.00099	---	---
Cobalt	TOT	µg/L	0.552	0.234	0.423	0.233	0.492	0.258	0.284	0.295	0.318	0.608	0.542	0.276	0.599	0.271	0.523	0.273
Copper	TOT	µg/L	121	29.3	90.9	20.1	93.8	20	18.7	18.7	19.2	85.8	82.7	18	101	19.4	48.1	7.51
Dibutyltin	TOT	µg/L	---	---	<0.001	<0.001	---	---	0.012	<0.001	---	---	<0.01	<0.01	---	---	0.008	<0.001
Dibutyltin Dichloride	TOT	µg/L	---	---	0.005	<0.001	---	---	0.016	<0.001	---	---	<0.01	<0.01	---	---	0.01	<0.001
Iron	TOT	µg/L	684	81.2	356	51.2	428	56	145	148	173	711	461	130	767	146	476	104
Lead	TOT	µg/L	2.58	0.423	2.04	0.364	2.8	0.395	0.581	0.597	0.666	2.87	3.01	0.587	4.22	0.585	2.09	0.327
Magnesium	TOT	mg/L	8.36	7.98	7.19	6.79	7.25	6.85	6.05	6.43	7.29	7.75	7.82	7	7.47	7.03	6.07	5.36
Manganese	TOT	µg/L	56.7	27.2	47.1	27	53.8	29.7	32.5	33.8	35.3	45.1	46.5	34.2	47.8	34.6	40	31.4
Mercury	TOT	µg/L	<0.019	0.0023	0.0072	<0.0019	0.0079	0.0027	<0.038	<0.038	<0.038	<0.038	<0.038	<0.038	<0.038	0.0032	<0.038	<0.0019
Methyl Mercury	TOT	µg/L	---	---	0.544	<0.023	---	---	0.833	0.99	---	---	0.131	0.188	---	---	---	---
Methyl Mercury	TOT	ng/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.898	<0.023
Molybdenum	TOT	µg/L	2.9	1.17	2.06	1.6	3.27	2.27	2.33	2.51	0.634	1.42	1.19	0.534	2.03	0.801	1.15	0.867
Monobutyltin	TOT	µg/L	---	---	0.01	0.004	---	---	0.022	0.057	---	---	0.011	0.005	---	---	0.023	0.012
Monobutyltin Trichloride	TOT	µg/L	---	---	0.016	0.006	---	---	0.036	0.092	---	---	0.018	0.008	---	---	0.036	0.019
Nickel	TOT	µg/L	2.84	1.43	2.54	1.44	2.72	1.48	2.07	2.13	1.87	3.79	3.2	1.78	3.33	1.72	3.85	2.48
Potassium	TOT	mg/L	14.1	12.3	14.2	11.6	14.8	12.1	15	15.9	16.5	17.7	17.1	16	17.7	16.8	15.1	13.7
Selenium	TOT	µg/L	0.405	0.131	0.257	0.111	0.265	0.119	0.187	0.195	0.229	0.5	0.291	0.182	0.448	0.204	0.19	0.138
Silver	TOT	µg/L	0.239	<0.01	0.024	<0.01	0.023	<0.01	0.023	0.023	0.036	0.358	0.409	0.031	0.469	0.039	0.011	<0.01
Sodium	TOT	mg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	44.6	46.6
Sulfur	TOT	mg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.4	8.5
Thallium	TOT	µg/L	0.0077	<0.002	0.0045	<0.002	0.0053	<0.002	<0.002	<0.002	0.0043	0.0152	0.009	<0.002	0.0145	0.0029	0.0046	<0.002
Tin	TOT	µg/L	2.14	0.33	0.87	0.33	0.88	0.3	0.49	0.54	0.72	1.71	1.31	0.82	1.68	0.64	0.8	0.45
Tributyltin	TOT	µg/L	---	---	<0.001	<0.001	---	---	<0.001	<0.001	---	---	<0.01	<0.01	---	---	0.003	<0.001
Tributyltin Chloride	TOT	µg/L	---	---	<0.001	<0.001	---	---	<0.001	<0.001	---	---	<0.01	<0.01	---	---	0.004	<0.001
Zinc	TOT	µg/L	137	45.4	94.9	42.2	110	44	49.9	49.9	42.7	155	172	37.3	174	34.3	109	24.3
1,1,1,2-Tetrachloroethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Dichlorodifluoromethane	TOT	µg/L	---	---	<2	<2	---	---	<2	<2	---	---	<2	<2	---	---	<2	<2
Nitrobenzene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25

Appendix B4, cont'd

			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
Parameter			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
NNDMA	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	---	---
N-nitrosodimethylamine	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
N-Nitrosodi-N-Propylamine	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Benzene	TOT	µg/L	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Ethylbenzene	TOT	µg/L	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Toluene	TOT	µg/L	---	---	0.45	<0.4	---	---	0.68	0.56	---	---	2.3	0.46	---	---	1.8	<0.4
Xylenes	TOT	µg/L	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
1,2,3,4-Tetrachlorobenzene	TOT	ng/L	---	---	---	<0.214	---	---	<0.223	<0.261	---	---	---	<0.244	---	---	---	<0.215
1,3,5-Trichlorobenzene	TOT	ng/L	---	---	---	<0.214	---	---	<0.223	<0.261	---	---	---	<0.244	---	---	---	<0.215
1,4-Dioxane	TOT	µg/L	---	---	0.18	0.26	---	---	0.12	0.26	---	---	0.17	0.32	---	---	0.24	0.35
1,7-Dimethylxanthine	TOT	ng/L	---	---	46200	<59	---	---	52200	216	---	---	---	439	---	---	---	2,760
Acrolein	TOT	µg/L	---	---	<2.8	<2.8	---	---	<2.8	<2.8	---	---	<2.8	<2.8	---	---	<2.8	<2.8
Acrylonitrile	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Delta-Hch Or Delta-Bhc	TOT	ng/L	---	---	---	<0.109	---	---	<0.112	<0.131	---	---	---	<0.158	---	---	---	<0.428
Dibromomethane	TOT	µg/L	---	---	<2	<2	---	---	<2	<2	---	---	<2	<2	---	---	<2	<2
Pentachlorobenzene	TOT	ng/L	---	---	---	<0.0214	---	---	0.099	0.046	---	---	---	0.033	---	---	---	0.023
Perfluorobutanoic acid	TOT	ng/L	---	---	2.23	3.09	---	---	28.6	13.5	---	---	2.4	2.03	---	---	---	5.65
Tetrachloromethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trans-Chlordane	TOT	ng/L	---	---	---	<0.0429	---	---	0.212	0.136	---	---	---	<0.0488	---	---	---	0.086
Trans-Nonachlor	TOT	ng/L	---	---	---	<0.0429	---	---	0.23	0.095	---	---	---	<0.0488	---	---	---	0.066
Tribromomethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Trichloromethane	TOT	µg/L	---	---	12	4.2	---	---	3.2	1.4	---	---	2.6	1	---	---	2.3	<1
1,2-diphenylhydrazine	TOT	µg/L	---	---	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05
2,4-dinitrotoluene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
2,6-dinitrotoluene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
3,3-dichlorobenzidine	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
4-Bromophenyl Phenyl Ether	TOT	µg/L	---	---	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05
4-Chlorophenyl Phenyl Ether	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachlorocyclopentadiene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachloroethane	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Alpha-Terpineol	TOT	µg/L	---	---	6	<5	---	---	10.5	<5	---	---	11.4	<5	---	---	6.6	<5
1,1,1-trichloroethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1,2,2-tetrachloroethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1,2-trichloroethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1-dichloroethene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2,3-Trichlorobenzene	TOT	ng/L	---	---	---	<0.214	---	---	<0.223	<0.261	---	---	---	<0.2	---	---	---	<0.2
1,2,4,5-/1,2,3,5-Tetrachlorobenzene	TOT	ng/L	---	---	---	<0.214	---	---	<0.223	<0.261	---	---	---	<0.2	---	---	---	<0.2
1,2,4-trichlorobenzene	TOT	µg/L	---	---	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2
1,2-dibromoethane	TOT	µg/L	---	---	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2
1,2-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2-dichlorobenzene	TOT	ng/L	---	---	---	0.671	---	---	1.82	1.35	---	---	---	0.311	---	---	---	0.345
1,2-dichloroethane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2-dichloropropane	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,3-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,3-dichlorobenzene	TOT	ng/L	---	---	---	<0.214	---	---	277	58.6	---	---	---	<0.2	---	---	---	2.36
1,4-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,4-dichlorobenzene	TOT	ng/L	---	---	---	26.7	---	---	9.9	2.21	---	---	---	34.4	---	---	---	19.5
Bromodichloromethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Bromomethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Chlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Chlorodibromomethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Chloroethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Chloroethene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Chloromethane	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Cis-1,2-Dichloroethene	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
cis-1,3-dichloropropene	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Hexachlorobutadiene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachlorobutadiene	TOT	ng/L	---	---	---	0.224	---	---	0.232	0.366	---	---	---	---	---	---	---	---
M & P Xylenes	TOT	µg/L	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Methyl Ethyl Ketone	TOT	µg/L	---	---	<50	<50	---	---	<50	<50	---	---	<50	<50	---	---	<50	<50
Methyl Tertiary Butyl Ether	TOT	µg/L	---	---	<4	<4	---	---	<4	<4	---	---	<4	<4	---	---	<4	<4
O-Xylene	TOT	µg/L	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Styrene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Tetrachloroethene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trans-1,2-Dichloroethene	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
trans-1,3-dichloropropene	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Trichloroethene	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trichlorofluoromethane	TOT	µg/L	---	---	<4	<4	---	---	<4	<4	---	---	<4	<4	---	---	<4	<4
17 alpha-Dihydroequilin	TOT	ng/L	---	---	<2.27	<1.97	---	---	<1.94	<1.95	---	---	<1.98	<1.98	---	---	---	1.95
17 alpha-Estradiol	TOT	ng/L	---	---	<7.92	<7.79	---	---	10.7	7.95	---	---	17	<7.91	---	---	---	7.78
17 alpha-Ethinyl-Estradiol	TOT	ng/L	---	---	<5.59	<4.92	---	---	<7.17	<4.87	---	---	<6.59	<4.94	---	---	---	4.86
17 beta-Estradiol	TOT	ng/L	---	---	11.3	<3.93	---	---	36.1	<3.89	---	---	10.6	<7.91	---	---	---	3.89
Equilenin	TOT	ng/L	---	---	<2.4	<0.481	---	---	2.72	1.14	---	---	2.1	<0.396	---	---	---	0.396
Equilin	TOT	ng/L	---	---	<2	<1.97	---	---	4.51	<1.95	---	---	<1.98	<1.98	---	---	---	1.95
Estriol	TOT	ng/L	---	---	225	<19.3	---	---	287	19.5	---	---	204	<21.2	---	---	---	34.4
Estrone	TOT	ng/L	---	---	33.4	<1.97	---	---	21.9	2.29	---	---	63.1	<3.16	---	---	---	44.8
4-Nitrophenol	TOT	µg/L	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
4-n-Octylphenol	TOT	ng/L	---	---	<3.97	<1.68	---	---	<3.08	1.31	---	---	5.64	<1.78	---	---	<2.82	2.25
4-Nonylphenol Diethoxylates	TOT	ng/L	---	---	717	<12.7	---	---	533	7.86	---	---	3690	524	---	---	2110	<2.95
4-Nonylphenol Monoethoxylates	TOT	ng/L	---	---	3290	96.2	---	---	5470	965	---	---	10900	292	---	---	9310	536
NP	TOT	ng/L	---	---	915	15.4	---	---	1460	145	---	---	3560	97	---	---	2210	78.1
1-Methylphenanthrene	TOT	ng/L	---	---	8.86	0.557	---	---	10.9	0.697	---	---	---	1.04	---	---	---	7.17
2,3,5-trimethylnaphthalene	TOT	ng/L	---	---	24.4	0.83	---	---	15.4	1.31	---	---	---	2.3	---	---	---	50.7
2,6-dimethylnaphthalene	TOT	ng/L	---	---	63.9	0.821	---	---	46.1	1.29	---	---	---	1.73	---	---	---	14.2
2-Chloronaphthalene	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
2-Methylnaphthalene	TOT	µg/L	---	---	0.12	0.025	---	---	0.33	0.011	---	---	0.16	<0.01	---	---	0.053	0.017
2-Methylnaphthalene	TOT	ng/L	---	---	57.4	1.68	---	---	19.3	5.6	---	---	---	3.97	---	---	---	6.11
Acenaphthene	TOT	µg/L	---	---	0.071	0.02	---	---	0.023	<0.01	---	---	0.084	<0.01	---	---	0.046	0.035
Acenaphthene	TOT	ng/L	---	---	9.27	0.847	---	---	32.9	3.05	---	---	---	4.97	---	---	---	44.8
Acenaphthylene	TOT	µg/L	---	---	0.33	<0.01	---	---	0.047	<0.01	---	---	0.065	0.013	---	---	<0.01	<0.01
Acenaphthylene	TOT	ng/L	---	---	0.998	0.276	---	---	0.864	0.257	---	---	---	0.343	---	---	---	0.931
Anthracene	TOT	µg/L	---	---	<0.01	0.031	---	---	0.035	0.027	---	---	0.027	<0.01	---	---	0.015	<0.01
Anthracene	TOT	ng/L	---	---	3.89	<0.301	---	---	6.15	0.207	---	---	---	<0.1	---	---	---	<0.687
Benzo(B)Fluoranthene + Benzo(J)Fluoranthene	TOT	µg/L	---	---	0.023	<0.01			0.023	<0.01			0.055	<0.01			0.033	<0.01
Benzo(K)Fluoranthene	TOT	µg/L	---	---	<0.01	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01
Benzo[a]anthracene	TOT	µg/L	---	---	<0.01	0.015	---	---	<0.01	<0.01	---	---	0.014	<0.01	---	---	<0.01	<0.01
Benzo[a]anthracene	TOT	ng/L	---	---	5.8	0.216	---	---	4.59	0.604	---	---	---	0.396	---	---	---	0.469
Benzo[a]pyrene	TOT	µg/L	---	---	0.008	<0.005	---	---	<0.005	<0.005	---	---	0.037	<0.005	---	---	<0.005	<0.005
Benzo[a]pyrene	TOT	ng/L	---	---	3.81	<0.4	---	---	2.96	0.509	---	---	---	0.427	---	---	---	<0.229
Benzo[b]fluoranthene	TOT	µg/L	---	---	<0.023	<0.01	---	---	<0.01	<0.01	---	---	0.055	<0.01	---	---	0.02	<0.01
Benzo[b]fluoranthene	TOT	ng/L	---	---	4.56	<0.249	---	---	3.65	<0.195	---	---	---	0.348	---	---	---	<0.158
Benzo[e]pyrene	TOT	ng/L	---	---	5.1	<0.381	---	---	4.38	0.475	---	---	---	0.353	---	---	---	<0.217

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Benzo[ghi]perylene	TOT	µg/L	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
Benzo[ghi]perylene	TOT	ng/L	---	---	3.46	<0.192	---	---	<4.18	0.543	---	---	---	0.402	---	---	---	0.229
Benzo[J,K]Fluoranthenes	TOT	ng/L	---	---	4.06	<0.267	---	---	3.9	0.664	---	---	---	<0.123	---	---	---	<0.178
Chrysene	TOT	µg/L	---	---	0.08	0.015	---	---	<0.01	0.015	---	---	0.065	<0.01	---	---	<0.01	<0.01
Chrysene	TOT	ng/L	---	---	5.99	0.628	---	---	6.67	1.02	---	---	---	1.11	---	---	---	1.05
dibenzo(a,h)anthracene	TOT	µg/L	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
dibenzo(a,h)anthracene	TOT	ng/L	---	---	6.4	<0.233	---	---	<7.75	<0.275	---	---	---	<0.418	---	---	---	<0.148
Dibenzothiophene	TOT	ng/L	---	---	20.9	0.943	---	---	12.9	1.3	---	---	---	1.06	---	---	---	5.91
Fluoranthene	TOT	µg/L	---	---	0.03	0.058	---	---	0.044	0.014	---	---	0.08	<0.01	---	---	0.061	0.013
Fluoranthene	TOT	ng/L	---	---	34.8	2.46	---	---	50.3	4.85	---	---	---	---	---	---	---	---
Fluorene	TOT	µg/L	---	---	0.013	0.028	---	---	0.053	0.014	---	---	0.11	<0.01	---	---	0.082	0.023
Fluorene	TOT	ng/L	---	---	17.7	1.78	---	---	23.8	3.42	---	---	---	---	---	---	---	---
High Molecular Weight PAH`s	TOT	µg/L	---	---	0.16	0.12	---	---	0.087	0.041	---	---	0.31	<0.02	---	---	0.13	0.024
Indeno(1,2,3-C,D)Pyrene	TOT	µg/L	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
Indeno(1,2,3-C,D)Pyrene	TOT	ng/L	---	---	6.39	<0.229	---	---	6.31	0.485	---	---	---	---	---	---	---	---
Low Molecular Weight PAH`s	TOT	µg/L	---	---	0.76	0.31	---	---	0.7	0.084	---	---	0.84	0.052	---	---	0.49	0.17
Naphthalene	TOT	µg/L	---	---	0.065	0.052	---	---	0.081	0.014	---	---	0.14	<0.01	---	---	0.095	0.012
Naphthalene	TOT	ng/L	---	---	59.6	4.53	---	---	90.4	8.08	---	---	---	---	---	---	---	---
Perylene	TOT	ng/L	---	---	<1.77	<0.365	---	---	<2.41	<0.283	---	---	---	---	---	---	---	---
Phenanthrene	TOT	µg/L	---	---	0.12	0.13	---	---	0.12	0.032	---	---	0.2	0.039	---	---	0.18	0.065
Phenanthrene	TOT	ng/L	---	---	102	6.68	---	---	132	12.5	---	---	---	---	---	---	---	---
Pyrene	TOT	µg/L	---	---	0.019	0.034	---	---	0.021	0.013	---	---	0.058	<0.01	---	---	0.04	0.011
Pyrene	TOT	ng/L	---	---	19.9	2.33	---	---	26.9	3.5	---	---	---	---	---	---	---	---
Total PAH	TOT	µg/L	---	---	0.92	0.43	---	---	0.79	0.12	---	---	1.2	0.052	---	---	0.62	0.19
Pbde 7	TOT	pg/L	---	---	---	<3.34	---	---	3.11	<2.98	---	---	---	<1.72	---	---	---	<1.37
Pbde 8/11	TOT	pg/L	---	---	---	<2.54	---	---	4.5	<2.38	---	---	---	<1.72	---	---	---	<1.37
Pbde 10	TOT	pg/L	---	---	---	<3.8	---	---	<1.42	<3.2	---	---	---	3.74	---	---	---	<1.37
Pbde 12/13	TOT	pg/L	---	---	---	<2.28	---	---	3.39	<2.11	---	---	---	<1.72	---	---	---	<1.37
Pbde 15	TOT	pg/L	---	---	---	1.99	---	---	23.8	2.59	---	---	---	3.56	---	---	---	2.87
Pbde 17/25	TOT	pg/L	---	---	---	18	---	---	154	23.5	---	---	---	25.5	---	---	---	12.3
Pbde 28/33	TOT	pg/L	---	---	---	28.4	---	---	530	63.5	---	---	---	66.6	---	---	---	27
Pbde 30	TOT	pg/L	---	---	---	<1.35	---	---	<3.98	<2.44	---	---	---	<1.72	---	---	---	<1.37
Pbde 32	TOT	pg/L	---	---	---	<1.35	---	---	<3.17	<1.94	---	---	---	<1.72	---	---	---	<1.37
Pbde 35	TOT	pg/L	---	---	---	<1.35	---	---	<3	<1.84	---	---	---	<1.72	---	---	---	<1.37
Pbde 37	TOT	pg/L	---	---	---	2.96	---	---	10.8	5.42	---	---	---	5.03	---	---	---	1.51
Pbde 47	TOT	pg/L	---	---	---	1190	---	---	22700	3430	---	---	---	3,690	---	---	---	961
Pbde 49	TOT	pg/L	---	---	---	28.8	---	---	680	71	---	---	---	84.6	---	---	---	27.9
Pbde 51	TOT	pg/L	---	---	---	3.96	---	---	108	10.1	---	---	---	10.1	---	---	---	4.61
Pbde 66	TOT	pg/L	---	---	---	19.5	---	---	229	50	---	---	---	65.5	---	---	---	22.7
Pbde 71	TOT	pg/L	---	---	---	6.68	---	---	137	12	---	---	---	10.9	---	---	---	5.96
Pbde 75	TOT	pg/L	---	---	---	2.29	---	---	<1.42	5.69	---	---	---	5.41	---	---	---	2.07
Pbde 77	TOT	pg/L	---	---	---	<1.35	---	---	<1.42	<1.66	---	---	---	<1.72	---	---	---	<1.37
Pbde 79	TOT	pg/L	---	---	---	27	---	---	47.1	37.9	---	---	---	27.8	---	---	---	23.8
Pbde 85	TOT	pg/L	---	---	---	41.6	---	---	960	156	---	---	---	55.2	---	---	---	35.8
Pbde 99	TOT	pg/L	---	---	---	1000	---	---	22600	3570	---	---	---	3,290	---	---	---	898
Pbde 100	TOT	pg/L	---	---	---	212	---	---	4330	724	---	---	---	690	---	---	---	183
Pbde 105	TOT	pg/L	---	---	---	<2.32	---	---	<117	<10.2	---	---	---	<3.32	---	---	---	<2.21
Pbde 116	TOT	pg/L	---	---	---	<2.99	---	---	<135	<11.9	---	---	---	423	---	---	---	<2.85
Pbde 119/120	TOT	pg/L	---	---	---	2.6	---	---	<96.5	9.3	---	---	---	46.6	---	---	---	2.26
Pbde 126	TOT	pg/L	---	---	---	<1.35	---	---	<60.8	<5.43	---	---	---	<1.81	---	---	---	<1.37
Pbde 128	TOT	pg/L	---	---	---	<2.69	---	---	<32.1	<3.57	---	---	---	2.95	---	---	---	<4.44

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Pbde 138/166	TOT	pg/L	---	---	---	7.61	---	---	123	36.8	---	---	---	32.9	---	---	---	10.2
Pbde 140	TOT	pg/L	---	---	---	3.18	---	---	76.9	11.6	---	---	---	10.3	---	---	---	3.71
Pbde 153	TOT	pg/L	---	---	---	77.9	---	---	1980	324	---	---	---	302	---	---	---	79.6
Pbde 154	TOT	pg/L	---	---	---	64.7	---	---	1450	252	---	---	---	239	---	---	---	63.8
Pbde 155	TOT	pg/L	---	---	---	5.53	---	---	114	17.2	---	---	---	18.2	---	---	---	7.68
Pbde 181	TOT	pg/L	---	---	---	<1.35	---	---	22.9	<2.74	---	---	---	<1.96	---	---	---	<1.37
Pbde 183	TOT	pg/L	---	---	---	12.1	---	---	418	41.8	---	---	---	80	---	---	---	13.6
Pbde 190	TOT	pg/L	---	---	---	<1.69	---	---	81.8	6.57	---	---	---	6.7	---	---	---	3.04
Pbde 203	TOT	pg/L	---	---	---	14.6	---	---	289	50.1	---	---	---	38.2	---	---	---	13.9
Pbde 206	TOT	pg/L	---	---	---	121	---	---	2700	367	---	---	---	385	---	---	---	54.2
Pbde 207	TOT	pg/L	---	---	---	176	---	---	2830	473	---	---	---	448	---	---	---	60.6
Pbde 208	TOT	pg/L	---	---	---	125	---	---	1780	344	---	---	---	234	---	---	---	44.6
Pbde 209	TOT	pg/L	---	---	---	1310	---	---	72100	4770	---	---	---	2,860	---	---	---	768
Decachloro Biphenyl	TOT	pg/L	---	---	---	1.89	---	---	13.8	4.41	---	---	10.3	---	---	---	---	2.65
Pcb 1	TOT	pg/L	---	---	---	4.05	---	---	16.6	4.8	---	---	8.62	4.27	---	---	---	7.37
Pcb 2	TOT	pg/L	---	---	---	1.32	---	---	5.29	1.67	---	---	4.98	2.63	---	---	---	4.83
Pcb 3	TOT	pg/L	---	---	---	2.57	---	---	18.2	7.35	---	---	13	3.97	---	---	---	6.93
Pcb 4	TOT	pg/L	---	---	---	6.19	---	---	42.9	19.5	---	---	14.2	7.2	---	---	---	6.43
Pcb 5	TOT	pg/L	---	---	---	<1.8	---	---	3.49	0	---	---	2.55	<2.31	---	---	---	0.96
Pcb 6	TOT	pg/L	---	---	---	<1.6	---	---	27.2	4.31	---	---	16.5	2.16	---	---	---	3.28
Pcb 7	TOT	pg/L	---	---	---	<1.65	---	---	7.66	34.2	---	---	<2.23	2.3	---	---	---	2.55
Pcb 8	TOT	pg/L	---	---	---	7.3	---	---	95.4	11.8	---	---	37.3	5.56	---	---	---	9.4
Pcb 9	TOT	pg/L	---	---	---	<1.59	---	---	7.37	<4.72	---	---	<2.17	<2.04	---	---	---	1.22
Pcb 10	TOT	pg/L	---	---	---	<1.62	---	---	1.77	<4.74	---	---	<2.22	<2.09	---	---	---	0.687
Pcb 11	TOT	pg/L	---	---	---	30.7	---	---	335	62.3	---	---	257	47.9	---	---	---	52
Pcb 12/13	TOT	pg/L	---	---	---	<1.75	---	---	12.7	<5.4	---	---	9.03	2.32	---	---	---	2.7
Pcb 14	TOT	pg/L	---	---	---	<1.67	---	---	<1.33	<4.9	---	---	<2.16	<2.03	---	---	---	0.714
Pcb 15	TOT	pg/L	---	---	---	5.59	---	---	53	13.7	---	---	23.7	3.65	---	---	---	7.99
Pcb 16	TOT	pg/L	---	---	---	3.73	---	---	67.7	18.9	---	---	27	7.92	---	---	---	5.31
Pcb 17	TOT	pg/L	---	---	---	3.38	---	---	58.4	16.2	---	---	23	6.11	---	---	---	4.9
Pcb 18/30	TOT	pg/L	---	---	---	8.59	---	---	115	39.1	---	---	36.9	10.9	---	---	---	10.5
Pcb 19	TOT	pg/L	---	---	---	2.27	---	---	14.3	5.62	---	---	6.6	1.7	---	---	---	1.9
Pcb 20/28	TOT	pg/L	---	---	---	9.84	---	---	195	45.9	---	---	98	16.9	---	---	---	19.1
Pcb 21/33	TOT	pg/L	---	---	---	4.64	---	---	116	17.6	---	---	53.8	5.92	---	---	---	9.09
Pcb 22	TOT	pg/L	---	---	---	4.17	---	---	77.2	17.8	---	---	38.9	6.52	---	---	---	7.61
Pcb 23	TOT	pg/L	---	---	---	<0.705	---	---	<0.716	<1.25	---	---	<0.971	<0.861	---	---	---	0.687
Pcb 24	TOT	pg/L	---	---	---	<0.676	---	---	2.16	<0.829	---	---	<0.962	<0.914	---	---	---	0.687
Pcb 25	TOT	pg/L	---	---	---	0.683	---	---	13.9	2.91	---	---	5.51	1.25	---	---	---	1.5
Pcb 26/29	TOT	pg/L	---	---	---	1.33	---	---	31.7	8	---	---	14.3	3	---	---	---	3.06
Pcb 27	TOT	pg/L	---	---	---	<0.676	---	---	7.71	2.89	---	---	2.87	<0.884	---	---	---	0.732
Pcb 31	TOT	pg/L	---	---	---	9.2	---	---	170	37.8	---	---	81.2	15.8	---	---	---	15.8
Pcb 32	TOT	pg/L	---	---	---	2.28	---	---	33.5	9.95	---	---	14.2	3.19	---	---	---	3.49
Pcb 34	TOT	pg/L	---	---	---	<0.694	---	---	<0.712	<1.28	---	---	<0.938	<0.861	---	---	---	0.687
Pcb 35	TOT	pg/L	---	---	---	<0.687	---	---	14.9	1.94	---	---	11	1.33	---	---	---	1.03
Pcb 36	TOT	pg/L	---	---	---	<0.676	---	---	3.17	<1.2	---	---	2.66	<0.861	---	---	---	0.687
Pcb 37	TOT	pg/L	---	---	---	3.33	---	---	57.9	12.9	---	---	29.2	4.33	---	---	---	5.15
Pcb 38	TOT	pg/L	---	---	---	<0.688	---	---	<0.712	<1.17	---	---	<0.947	<0.861	---	---	---	0.687
Pcb 39	TOT	pg/L	---	---	---	<0.679	---	---	1.79	<1.18	---	---	<0.882	<0.861	---	---	---	0.687
Pcb 40/41/71	TOT	pg/L	---	---	---	4.48	---	---	75.8	16.7	---	---	52.9	9.98	---	---	---	7.62
Pcb 42	TOT	pg/L	---	---	---	2.37	---	---	38.3	8.52	---	---	21.5	4.99	---	---	---	2.9
Pcb 43	TOT	pg/L	---	---	---	0.696	---	---	6.16	2.21	---	---	3.28	<1.79	---	---	---	0.877

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Pcb 44/47/65	TOT	pg/L	---	---	---	29	---	---	275	82.2	---	---	201	66.7	---	---	---	21.1
Pcb 45/51	TOT	pg/L	---	---	---	4.48	---	---	46.9	11	---	---	31.9	9.98	---	---	---	4.08
Pcb 46	TOT	pg/L	---	---	---	<0.676	---	---	8.71	2.25	---	---	6.77	1.65	---	---	---	1.06
Pcb 48	TOT	pg/L	---	---	---	1.98	---	---	34.8	8.83	---	---	19.8	2.51	---	---	---	2.19
Pcb 49/69	TOT	pg/L	---	---	---	3.83	---	---	86.3	18	---	---	57.3	9.25	---	---	---	8.52
Pcb 50/53	TOT	pg/L	---	---	---	0.747	---	---	19.8	4.86	---	---	8.61	1.91	---	---	---	1.93
Pcb 52	TOT	pg/L	---	---	---	12.4	---	---	229	40.1	---	---	159	29.4	---	---	---	18.7
Pcb 54	TOT	pg/L	---	---	---	<0.676	---	---	<0.712	<0.945	---	---	<1.27	<1.21	---	---	---	<0.687
Pcb 55	TOT	pg/L	---	---	---	<0.697	---	---	3.12	1.79	---	---	1.7	<1.41	---	---	---	<0.969
Pcb 56	TOT	pg/L	---	---	---	2.77	---	---	64.3	13.5	---	---	38.3	7.45	---	---	---	3.37
Pcb 57	TOT	pg/L	---	---	---	<0.676	---	---	<2.21	<1.75	---	---	<1.44	<1.3	---	---	---	<0.894
Pcb 58	TOT	pg/L	---	---	---	<0.676	---	---	<2.58	<1.86	---	---	<1.5	<1.36	---	---	---	<0.916
Pcb 59/62/75	TOT	pg/L	---	---	---	0.898	---	---	13.1	3.56	---	---	6.68	2.01	---	---	---	1.05
Pcb 60	TOT	pg/L	---	---	---	1.44	---	---	41.5	8.25	---	---	23.8	4.18	---	---	---	2.25
Pcb 61/70/74/76	TOT	pg/L	---	---	---	14	---	---	290	50.4	---	---	191	30.8	---	---	---	20.7
Pcb 63	TOT	pg/L	---	---	---	<0.676	---	---	5.31	<1.69	---	---	2.82	<1.28	---	---	---	<0.893
Pcb 64	TOT	pg/L	---	---	---	3.19	---	---	66.4	15.6	---	---	44.3	8.24	---	---	---	5.6
Pcb 66	TOT	pg/L	---	---	---	5.44	---	---	125	24.8	---	---	71.1	11.3	---	---	---	10.9
Pcb 67	TOT	pg/L	---	---	---	<0.676	---	---	4.69	<1.47	---	---	2.23	<1.16	---	---	---	<0.81
Pcb 68	TOT	pg/L	---	---	---	1.61	---	---	21.4	4.63	---	---	14.9	4.77	---	---	---	1.15
Pcb 72	TOT	pg/L	---	---	---	<0.676	---	---	<2.17	1.98	---	---	2.39	1.69	---	---	---	<0.854
Pcb 73	TOT	pg/L	---	---	---	<0.676	---	---	1.69	0.821	---	---	1.26	<1.01	---	---	---	<0.687
Pcb 77	TOT	pg/L	---	---	---	1.01	---	---	14.1	2.09	---	---	8.05	<1.52	---	---	---	<0.929
Pcb 78	TOT	pg/L	---	---	---	<0.676	---	---	<2.28	<1.78	---	---	<1.5	<1.36	---	---	---	<0.926
Pcb 79	TOT	pg/L	---	---	---	<0.676	---	---	3.26	<1.46	---	---	2.74	<1.15	---	---	---	<0.778
Pcb 80	TOT	pg/L	---	---	---	<0.676	---	---	<2.03	<1.67	---	---	<1.34	<1.21	---	---	---	<0.843
Pcb 81	TOT	pg/L	---	---	---	<0.676	---	---	<2.53	<1.9	---	---	<1.67	<1.53	---	---	---	<0.9
Pcb 82	TOT	pg/L	---	---	---	<1.1	---	---	21	3.49	---	---	16.5	2.99	---	---	---	1.59
Pcb 83/99	TOT	pg/L	---	---	---	6.14	---	---	119	17.3	---	---	98	17	---	---	---	13.4
Pcb 84	TOT	pg/L	---	---	---	2.19	---	---	57.8	9.09	---	---	46.6	8.88	---	---	---	3.72
Pcb 85/116/117	TOT	pg/L	---	---	---	1.84	---	---	33.9	5.26	---	---	28.7	4.5	---	---	---	4.06
Pcb 86/87/97/108/119/125	TOT	pg/L	---	---	---	7.7	---	---	141	21.3	---	---	115	21.8	---	---	---	14.9
Pcb 88/91	TOT	pg/L	---	---	---	1.06	---	---	30.3	4.29	---	---	23.7	4.5	---	---	---	2.59
Pcb 89	TOT	pg/L	---	---	---	<1.06	---	---	<1.85	<1.67	---	---	<1.98	<1.59	---	---	---	<1.47
Pcb 90/101/113	TOT	pg/L	---	---	---	10.6	---	---	221	29.1	---	---	175	27.6	---	---	---	19.1
Pcb 92	TOT	pg/L	---	---	---	2.03	---	---	37.9	4.91	---	---	24.8	4.73	---	---	---	3.77
Pcb 93/95/98/100/102	TOT	pg/L	---	---	---	11.4	---	---	195	25.3	---	---	151	31.5	---	---	---	16.5
Pcb 94	TOT	pg/L	---	---	---	<1.06	---	---	<1.95	<1.71	---	---	<2.06	<1.65	---	---	---	<1.45
Pcb 96	TOT	pg/L	---	---	---	<0.676	---	---	1.74	<0.829	---	---	<1.26	<0.994	---	---	---	<1.04
Pcb 103	TOT	pg/L	---	---	---	<0.847	---	---	<1.6	<1.42	---	---	<1.65	<1.32	---	---	---	<1.19
Pcb 104	TOT	pg/L	---	---	---	<0.676	---	---	1.01	<0.829	---	---	<1.53	<1.07	---	---	---	<0.971
Pcb 105	TOT	pg/L	---	---	---	3.97	---	---	58.4	8.33	---	---	49.6	9.09	---	---	---	7.13
Pcb 106	TOT	pg/L	---	---	---	<0.786	---	---	<2.64	<1.35	---	---	<1.43	<1.5	---	---	---	<1.2
Pcb 107/124	TOT	pg/L	---	---	---	<0.783	---	---	5.97	1.04	---	---	4.56	<1.55	---	---	---	<1.28
Pcb 109	TOT	pg/L	---	---	---	<0.74	---	---	9.52	1.59	---	---	6.75	<1.33	---	---	---	1.44
Pcb 110/115	TOT	pg/L	---	---	---	11	---	---	201	28.4	---	---	156	26.6	---	---	---	22.7
Pcb 111	TOT	pg/L	---	---	---	<0.756	---	---	<1.34	<1.2	---	---	<1.4	<1.12	---	---	---	<1.03
Pcb 112	TOT	pg/L	---	---	---	<0.713	---	---	<1.37	<1.16	---	---	<1.34	<1.08	---	---	---	<0.958
Pcb 114	TOT	pg/L	---	---	---	<0.843	---	---	4.63	<1.56	---	---	5.56	<1.69	---	---	---	<1.28
Pcb 118	TOT	pg/L	---	---	---	9.8	---	---	155	23	---	---	130	24.2	---	---	---	20.8
Pcb 120	TOT	pg/L	---	---	---	<0.707	---	---	<1.26	<1.13	---	---	<1.29	<1.04	---	---	---	<0.955

Appendix B4, cont'd

			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
Parameter			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Pcb 121	TOT	pg/L	---	---	---	<0.762	---	---	2.4	<1.23	---	---	1.43	<1.12	---	---	---	<1.05
Pcb 122	TOT	pg/L	---	---	---	<0.832	---	---	<3.08	<1.7	---	---	<1.52	<1.59	---	---	---	<1.34
Pcb 123	TOT	pg/L	---	---	---	<0.872	---	---	9.6	1.09	---	---	7.36	<1.78	---	---	---	<1.4
Pcb 126	TOT	pg/L	---	---	---	<0.827	---	---	<3.37	<1.78	---	---	<1.66	<1.78	---	---	---	<1.31
Pcb 127	TOT	pg/L	---	---	---	<0.756	---	---	<2.91	<1.53	---	---	<1.42	<1.48	---	---	---	<1.25
Pcb 128/166	TOT	pg/L	---	---	---	1.23	---	---	18.2	3.23	---	---	16.1	3.06	---	---	---	2.16
Pcb 129/138/160/163	TOT	pg/L	---	---	---	8.8	---	---	172	24.4	---	---	153	23.9	---	---	---	18.5
Pcb 130	TOT	pg/L	---	---	---	<0.835	---	---	8.96	1.79	---	---	8.18	1.74	---	---	---	<1.88
Pcb 131	TOT	pg/L	---	---	---	<0.77	---	---	2.94	<1.03	---	---	2.92	<1.64	---	---	---	<1.89
Pcb 132	TOT	pg/L	---	---	---	2.42	---	---	51.5	8.94	---	---	47.9	6.35	---	---	---	5.12
Pcb 133	TOT	pg/L	---	---	---	<0.75	---	---	2.44	<0.977	---	---	2.31	<1.53	---	---	---	<1.79
Pcb 134/143	TOT	pg/L	---	---	---	<0.768	---	---	8.33	1.59	---	---	7.52	<1.58	---	---	---	<1.85
Pcb 135/151/154	TOT	pg/L	---	---	---	2.64	---	---	53.1	7.39	---	---	44.4	8.09	---	---	---	5.09
Pcb 136	TOT	pg/L	---	---	---	1.05	---	---	25.5	3.1	---	---	20.7	3.59	---	---	---	1.39
Pcb 137	TOT	pg/L	---	---	---	<0.81	---	---	8.63	1.49	---	---	10.1	<1.57	---	---	---	<1.8
Pcb 139/140	TOT	pg/L	---	---	---	<0.696	---	---	5.24	0.889	---	---	6.48	<1.44	---	---	---	<1.66
Pcb 141	TOT	pg/L	---	---	---	<0.699	---	---	27.1	4.07	---	---	20.3	4.32	---	---	---	3.36
Pcb 142	TOT	pg/L	---	---	---	<0.775	---	---	<1.51	<0.97	---	---	<1.88	<1.64	---	---	---	<1.78
Pcb 144	TOT	pg/L	---	---	---	<0.676	---	---	8.92	1.43	---	---	7.32	<1.53	---	---	---	<1.16
Pcb 145	TOT	pg/L	---	---	---	<0.676	---	---	<0.712	0	---	---	<1.53	<1.27	---	---	---	<0.964
Pcb 146	TOT	pg/L	---	---	---	1.09	---	---	22.9	3.99	---	---	20.2	5.15	---	---	---	2.97
Pcb 147/149	TOT	pg/L	---	---	---	5.12	---	---	123	16.2	---	---	112	17	---	---	---	11.9
Pcb 148	TOT	pg/L	---	---	---	<0.676	---	---	1.75	<0.829	---	---	<1.92	<1.6	---	---	---	<1.22
Pcb 150	TOT	pg/L	---	---	---	<0.676	---	---	1.44	<0.829	---	---	<1.47	<1.23	---	---	---	<0.913
Pcb 152	TOT	pg/L	---	---	---	<0.676	---	---	<0.712	<0.829	---	---	<1.41	<1.17	---	---	---	<0.884
Pcb 153/168	TOT	pg/L	---	---	---	9.04	---	---	158	25.6	---	---	157	22.6	---	---	---	17.3
Pcb 155	TOT	pg/L	---	---	---	0.777	---	---	21.3	2.83	---	---	20.2	2.42	---	---	---	1.17
Pcb 156/157	TOT	pg/L	---	---	---	1.58	---	---	26.4	4.16	---	---	24.9	4.39	---	---	---	1.83
Pcb 158	TOT	pg/L	---	---	---	0.998	---	---	14.3	2.23	---	---	11.2	2.48	---	---	---	1.67
Pcb 159	TOT	pg/L	---	---	---	<0.676	---	---	<1.05	<0.829	---	---	<1.26	<1.1	---	---	---	<1.27
Pcb 161	TOT	pg/L	---	---	---	<0.676	---	---	<1.02	<0.829	---	---	<1.31	<1.14	---	---	---	<1.22
Pcb 162	TOT	pg/L	---	---	---	<0.676	---	---	<1.07	<0.829	---	---	<1.3	<1.13	---	---	---	<1.36
Pcb 164	TOT	pg/L	---	---	---	<0.676	---	---	8.21	1.17	---	---	6.7	1.41	---	---	---	<1.28
Pcb 165	TOT	pg/L	---	---	---	<0.676	---	---	<1.18	<0.829	---	---	<1.44	<1.26	---	---	---	<1.46
Pcb 167	TOT	pg/L	---	---	---	<0.676	---	---	7.34	1.12	---	---	5.34	<1.2	---	---	---	<1.25
Pcb 169	TOT	pg/L	---	---	---	<0.676	---	---	<1.29	<0.844	---	---	<1.4	<1.23	---	---	---	<1.3
Pcb 170	TOT	pg/L	---	---	---	2.04	---	---	33.3	4.57	---	---	35.2	5.21	---	---	---	2.18
Pcb 171/173	TOT	pg/L	---	---	---	1.2	---	---	8.25	1.74	---	---	8.18	<1.71	---	---	---	0.958
Pcb 172	TOT	pg/L	---	---	---	<0.76	---	---	3.26	1.44	---	---	4.27	<1.74	---	---	---	0.778
Pcb 174	TOT	pg/L	---	---	---	2.36	---	---	23	4.64	---	---	24.3	4.99	---	---	---	1.93
Pcb 184	TOT	pg/L	---	---	---	1.27	---	---	31.6	4.7	---	---	18.5	3.4	---	---	---	<0.687
Pcb 175	TOT	pg/L	---	---	---	<0.676	---	---	1.62	<0.829	---	---	1.92	<1.57	---	---	---	<0.687
Pcb 176	TOT	pg/L	---	---	---	<0.676	---	---	4.33	<0.829	---	---	3.64	<1.17	---	---	---	1.09
Pcb 177	TOT	pg/L	---	---	---	0.911	---	---	13.1	3.04	---	---	15.1	3.53	---	---	---	<0.687
Pcb 178	TOT	pg/L	---	---	---	<0.704	---	---	10.6	1.59	---	---	14.1	<1.66	---	---	---	0.861
Pcb 179	TOT	pg/L	---	---	---	0.763	---	---	14.9	2.4	---	---	13.7	2.94	---	---	---	7.81
Pcb 180/193	TOT	pg/L	---	---	---	4.29	---	---	101	15.3	---	---	<1.81	15.4	---	---	---	<0.687
Pcb 181	TOT	pg/L	---	---	---	<0.714	---	---	<1.26	<0.829	---	---	<1.83	<1.65	---	---	---	<0.687
Pcb 182	TOT	pg/L	---	---	---	<0.676	---	---	<1.2	<0.829	---	---	<1.69	<1.53	---	---	---	1.71
Pcb 183/185	TOT	pg/L	---	---	---	1.43	---	---	21.8	3.4	---	---	24.1	3.25	---	---	---	1.54
Pcb 186	TOT	pg/L	---	---	---	<0.676	---	---	<0.992	<0.829	---	---	<1.38	<1.25	---	---	---	<0.687

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Pcb 187	TOT	pg/L	---	---	---	3.3	---	---	46.8	8.68	---	---	49.1	7.6	---	---	---	4.27
Pcb 188	TOT	pg/L	---	---	---	<0.676	---	---	<0.969	<0.829	---	---	<1.31	<1.23	---	---	---	0.687
Pcb 189	TOT	pg/L	---	---	---	<0.676	---	---	<4.34	<0.829	---	---	<1.62	<1.18	---	---	---	0.692
Pcb 190	TOT	pg/L	---	---	---	<0.676	---	---	6.02	1.13	---	---	6.13	<1.28	---	---	---	0.687
Pcb 191	TOT	pg/L	---	---	---	<0.676	---	---	<0.984	<0.829	---	---	<1.38	<1.24	---	---	---	0.687
Pcb 192	TOT	pg/L	---	---	---	<0.676	---	---	<1.09	<0.829	---	---	<1.51	<1.37	---	---	---	0.687
Pcb 194	TOT	pg/L	---	---	---	1.38	---	---	17.8	2.62	---	---	21.1	2.74	---	---	---	1.25
Pcb 195	TOT	pg/L	---	---	---	<0.676	---	---	5.43	<0.829	---	---	4.59	<1.38	---	---	---	0.687
Pcb 196	TOT	pg/L	---	---	---	0.973	---	---	7.16	1.46	---	---	5.24	<1.62	---	---	---	0.811
Pcb 197/200	TOT	pg/L	---	---	---	<0.676	---	---	4.65	0.882	---	---	4.33	<1.22	---	---	---	0.687
Pcb 198/199	TOT	pg/L	---	---	---	<0.739	---	---	23.6	3.83	---	---	25.2	4.24	---	---	---	2
Pcb 201	TOT	pg/L	---	---	---	<0.676	---	---	2.7	<0.829	---	---	2.14	<1.18	---	---	---	0.687
Pcb 202	TOT	pg/L	---	---	---	<0.676	---	---	6.27	1.34	---	---	8	<1.33	---	---	---	0.687
Pcb 203	TOT	pg/L	---	---	---	<0.681	---	---	12.5	2.32	---	---	13.6	<1.53	---	---	---	1.2
Pcb 204	TOT	pg/L	---	---	---	<0.676	---	---	1.56	<0.829	---	---	<1.58	<1.18	---	---	---	0.687
Pcb 205	TOT	pg/L	---	---	---	<0.676	---	---	<0.712	<0.829	---	---	<1.81	<1.17	---	---	---	0.687
Pcb 206	TOT	pg/L	---	---	---	<1.28	---	---	11.6	<3.12	---	---	<7.5	<7.69	---	---	---	0.768
Pcb 207	TOT	pg/L	---	---	---	<0.908	---	---	1.81	<2.1	---	---	<4.98	<5.05	---	---	---	0.687
Pcb 208	TOT	pg/L	---	---	---	<0.987	---	---	4.02	<2.24	---	---	<5.26	<5.27	---	---	---	0.687
Pcb 209	TOT	pg/L	---	---	---	1.89	---	---	13.8	4.41	---	---	10.3	<2.03	---	---	---	2.65
Tota Hexachloro Biphenyls	TOT	pg/L	---	---	---	32.3	---	---	776	93.7	---	---	574	82.4	---	---	---	71.1
Total Dichloro Biphenyls	TOT	pg/L	---	---	---	49.8	---	---	586	126	---	---	335	50.2	---	---	---	86.5
Total Heptachloro Biphenyls	TOT	pg/L	---	---	---	14	---	---	281	44.1	---	---	120	20.4	---	---	---	20.7
Total Monochloro Biphenyls	TOT	pg/L	---	---	---	7.94	---	---	40.1	6.07	---	---	26.6	3.97	---	---	---	19.1
Total Nonachloro Biphenyls	TOT	pg/L	---	---	---	<-999	---	---	15.6	<-999	---	---	<-999	<-999	---	---	---	0.768
Total Octachloro Biphenyls	TOT	pg/L	---	---	---	<-999	---	---	80.1	7.78	---	---	58.8	<-999	---	---	---	3.26
Total Pentachloro Biphenyls	TOT	pg/L	---	---	---	58.2	---	---	1300	158	---	---	1010	157	---	---	---	132
Total Tetrachloro Biphenyls	TOT	pg/L	---	---	---	85.3	---	---	1470	312	---	---	899	130	---	---	---	114
Total Trichloro Biphenyls	TOT	pg/L	---	---	---	44.1	---	---	979	233	---	---	423	52.8	---	---	---	89.2
Pcb Teq 3	TOT	pg/L	---	---	---	0.0112	---	---	0.131	0.00447	---	---	0.111	0.0963	---	---	---	0.00371
Pcb Teq 4	TOT	pg/L	---	---	---	0.968	---	---	1.08	1.13	---	---	1.03	1.12	---	---	---	0.948
PCBs Total	TOT	pg/L	---	---	---	293	---	---	5540	935	---	---	3460	497	---	---	---	539
1,2,3,4,6,7,8-HPCDD	TOT	pg/L	---	---	---	1.08	---	---	10.5	1.88	---	---	10.6	1.46	---	---	---	<0.561
1,2,3,4,6,7,8-HPCDF	TOT	pg/L	---	---	---	<0.568	---	---	2.03	<0.657	---	---	1.33	<0.626	---	---	---	<0.561
1,2,3,4,7,8,9-HPCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,4,7,8-HXCDD	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,4,7,8-HXCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,6,7,8-HXCDD	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	0.552	<0.626	---	---	---	<0.561
1,2,3,6,7,8-HXCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,7,8,9-HXCDD	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,7,8,9-HXCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	0.807	---	---	---	<0.561
1,2,3,7,8-PECDD	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
1,2,3,7,8-PECDF	TOT	pg/L	---	---	---	0.579	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
2,3,4,6,7,8-HXCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
2,3,4,7,8-PECDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
2,3,7,8-TCDD	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
2,3,7,8-TCDF	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
OCDD	TOT	pg/L	---	---	---	3.88	---	---	59	6.89	---	---	54.2	8.69	---	---	---	2.39
OCDF	TOT	pg/L	---	---	---	<0.568	---	---	2.25	0.653	---	---	1.5	0.899	---	---	---	<0.561
TOTAL HEPTA-DIOXINS	TOT	pg/L	---	---	---	1.08	---	---	17.5	0.691	---	---	18.6	1.46	---	---	---	<0.561
TOTAL HEPTA-FURANS	TOT	pg/L	---	---	---	<0.568	---	---	2.03	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
TOTAL HEXA-DIOXINS	TOT	pg/L	---	---	---	<0.568	---	---	2.43	<0.657	---	---	1.84	<0.626	---	---	---	<0.561
TOTAL HEXA-FURANS	TOT	pg/L	---	---	---	<0.568	---	---	0.755	<0.657	---	---	<0.545	0.807	---	---	---	<0.561
TOTAL PENTA-DIOXINS	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
TOTAL PENTA-FURANS	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
TOTAL TETRA-DIOXINS	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
TOTAL TETRA-FURANS	TOT	pg/L	---	---	---	<0.568	---	---	<0.563	<0.657	---	---	<0.545	<0.626	---	---	---	<0.561
2,4-DDD	TOT	ng/L	---	---	---	0.058	---	---	0.241	<0.223	---	---	---	<0.0696	---	---	---	0.21
2,4-DDE	TOT	ng/L	---	---	---	<0.0429	---	---	<0.0568	<0.0768	---	---	---	<0.0488	---	---	---	<0.0429
2,4-DDT	TOT	ng/L	---	---	---	<0.0678	---	---	<0.201	<0.33	---	---	---	<0.0986	---	---	---	<0.396
4,4-DDD	TOT	ng/L	---	---	---	<0.0576	---	---	<0.161	<0.257	---	---	---	<0.087	---	---	---	<0.252
4,4-DDE	TOT	ng/L	---	---	---	0.06	---	---	0.716	0.117	---	---	---	0.082	---	---	---	0.138
4,4-DDT	TOT	ng/L	---	---	---	<0.0776	---	---	<0.239	<0.359	---	---	---	<0.113	---	---	---	<0.443
ABHC	TOT	ng/L	---	---	---	0.044	---	---	<0.07	<0.075	---	---	---	<0.0488	---	---	---	<0.0888
Aldrin	TOT	ng/L	---	---	---	<0.0429	---	---	<0.0447	<0.0523	---	---	---	<0.0488	---	---	---	<0.0429
Alpha Chlordane	TOT	ng/L	---	---	---	<0.0429	---	---	0.167	0.1	---	---	---	<0.0488	---	---	---	<0.0429
Alpha-Endosulfan	TOT	ng/L	---	---	---	0.13	---	---	0.295	0.351	---	---	---	0.201	---	---	---	0.272
Beta-Endosulfan	TOT	ng/L	---	---	---	0.341	---	---	<0.112	0.731	---	---	---	0.746	---	---	---	0.286
Beta-HCH Or Beta-BHC	TOT	ng/L	---	---	---	<0.0578	---	---	<0.157	<0.167	---	---	---	0.062	---	---	---	<0.153
Bis(2-Chloroethoxy)Methane	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.37	<0.25
Bis(2-Chloroethyl)Ether	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Bis(2-Chloroisopropyl)Ether	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Cis-Nonachlor	TOT	ng/L	---	---	---	0.049	---	---	0.047	0.107	---	---	---	<0.0488	---	---	---	<0.0429
Dieldrin	TOT	ng/L	---	---	---	0.143	---	---	0.401	0.138	---	---	---	0.18	---	---	---	<0.107
Endosulfan Sulfate	TOT	ng/L	---	---	---	0.171	---	---	<0.112	<0.131	---	---	---	0.153	---	---	---	<0.107
Endrin	TOT	ng/L	---	---	---	<0.109	---	---	<0.112	<0.131	---	---	---	<0.135	---	---	---	<0.107
Endrin Aldehyde	TOT	ng/L	---	---	---	<0.109	---	---	<0.547	<0.384	---	---	---	<0.775	---	---	---	<1.07
Hch, Gamma	TOT	ng/L	---	---	---	0.085	---	---	16.5	0.318	---	---	---	0.119	---	---	---	0.13
Heptachlor	TOT	ng/L	---	---	---	<0.0429	---	---	-999	0.057	---	---	---	<0.0488	---	---	---	0.137
Heptachlor Epoxide	TOT	ng/L	---	---	---	<0.109	---	---	<0.112	<0.131	---	---	---	<0.135	---	---	---	<0.107
Hexachlorobenzene	TOT	ng/L	---	---	---	0.055	---	---	0.238	0.092	---	---	---	0.035	---	---	---	0.03
Methoxyclor	TOT	ng/L	---	---	---	<0.217	---	---	<0.223	<0.261	---	---	---	0.326	---	---	---	<0.215
Mirex	TOT	ng/L	---	---	---	<0.0429	---	---	<0.0447	<0.0523	---	---	---	<0.0488	---	---	---	<0.0429
Octachlorostyrene	TOT	ng/L	---	---	---	<0.0021	---	---	0.012	0.015	---	---	---	<0.006	---	---	---	0.005
Oxychlordane	TOT	ng/L	---	---	---	<0.0429	---	---	0.11	0.078	---	---	---	<0.0488	---	---	---	0.061
Perfluoroheptanoic Acid (PFHpA)	TOT	ng/L	---	---	1.29	3.07	---	---	1.68	2.35	---	---	0.873	0.963	---	---	---	1.85
Perfluorohexanoic Acid (PFHxA)	TOT	ng/L	---	---	4.15	12.4	---	---	7.52	12.9	---	---	2.97	7.72	---	---	---	10.3
Perfluorononanoic Acid (PFNA)	TOT	ng/L	---	---	0.648	1.32	---	---	0.724	1.57	---	---	0.517	0.861	---	---	---	0.591
Perfluorooctane Sulfonamide (PFOSA)	TOT	ng/L	---	---	<0.395	0.461	---	---	<0.417	0.683	---	---	<0.422	2.32	---	---	---	<0.395
Perfluorooctanesulfonic acid (PFOS)	TOT	ng/L	---	---	10.7	5.04	---	---	6.05	2.85	---	---	3.29	1.96	---	---	---	2.94
Perfluorooctanoic acid (PFOA)	TOT	ng/L	---	---	3.14	8.78	---	---	3.16	6.69	---	---	2.13	4.35	---	---	---	3.36
Perfluoropentanoic Acid (PFPeA)	TOT	ng/L	---	---	2.58	19.2	---	---	12.8	19	---	---	2.91	10.9	---	---	---	10.2
PFBS	TOT	ng/L	---	---	3.95	3.65	---	---	2.54	1.81	---	---	2.85	1.87	---	---	---	2.46
PFDoA	TOT	ng/L	---	---	<0.395	<0.4	---	---	<0.417	<0.474	---	---	<0.422	<0.449	---	---	---	<0.395
PFHxS	TOT	ng/L	---	---	5.18	4.61	---	---	2.84	2.97	---	---	2.28	2.89	---	---	---	3.63
PFUnA	TOT	ng/L	---	---	<0.395	<0.4	---	---	<0.417	<0.474	---	---	<0.422	<0.449	---	---	---	<0.395
Bis(2-Ethylhexyl)Phthalate	TOT	µg/L	---	---	5.8	<5	---	---	7.3	<5	---	---	9.4	<5	---	---	5.9	<5
Butylbenzyl Phthalate	TOT	µg/L	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
Diethyl Phthalate	TOT	µg/L	---	---	1.42	0.36	---	---	0.45	0.51	---	---	0.9	<0.25	---	---	0.28	<0.25
Dimethyl Phthalate	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Di-N-Butyl Phthalate	TOT	µg/L	---	---	<2.5	<2.5	---	---	2.7	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
Di-N-Octyl Phthalate	TOT	µg/L	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25

Appendix B4, cont'd

			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
Parameter			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
2-Hydroxy-Ibuprofen	TOT	ng/L	---	---	24,500	91.7	---	---	38,700	10,400	---	---	34,800	2,110	---	---	12300	691
Acetaminophen	TOT	ng/L	---	---	256,000	<14.7	---	---	201000	15	---	---	---	26.8	---	---	---	<14.6
Azithromycin	TOT	ng/L	---	---	553	281	---	---	261	586	---	---	---	593	---	---	---	492
Bisphenol A	TOT	ng/L	---	---	128	54.5	---	---	213	109	---	---	169	253	---	---	275	175
Caffeine	TOT	ng/L	---	---	117,000	<14.7	---	---	129,000	159	---	---	---	233	---	---	---	2,910
Carbadox	TOT	ng/L	---	---	<5.2	<1.47	---	---	<18	<4.81	---	---	---	<5.86	---	---	---	<3.54
Carbamazepine	TOT	ng/L	---	---	451	607	---	---	608	660	---	---	---	963	---	---	---	721
Cefotaxime	TOT	ng/L	---	---	-999	-999	---	---	<70	0	---	---	---	<5.93	---	---	---	<17.6
Ciprofloxacin	TOT	ng/L	---	---	788	235	---	---	416	292	---	---	---	394	---	---	---	191
Clarithromycin	TOT	ng/L	---	---	1110	415	---	---	262	427	---	---	---	830	---	---	---	386
Clinafloxacin	TOT	ng/L	---	---	<55.5	<20.9	---	---	<5.81	<15	---	---	---	<29.8	---	---	---	<17.8
Cloxacillin	TOT	ng/L	---	---	<13.6	<22	---	---	<25.9	<4.75	---	---	---	100	---	---	---	<9.73
Dehydronifedipine	TOT	ng/L	---	---	4.95	11.4	---	---	<9.36	13.8	---	---	---	34	---	---	---	25.2
Digoxigenin	TOT	ng/L	---	---	<160	<164	---	---	<143	<58.7	---	---	---	<10.6	---	---	---	<17
Digoxin	TOT	ng/L	---	---	36.7	<5.9	---	---	59.1	<7.95	---	---	---	<5.93	---	---	---	<5.84
Diltiazem	TOT	ng/L	---	---	603	297	---	---	858	680	---	---	---	1,000	---	---	---	642
Diphenhydramine	TOT	ng/L	---	---	1330	265	---	---	881	927	---	---	---	1,060	---	---	---	751
Enrofloxacin	TOT	ng/L	---	---	<8.44	<3.18	---	---	<2.9	<3.07	---	---	---	<2.97	---	---	---	<2.92
Erythromycin-H2O	TOT	ng/L	---	---	93.4	89.7	---	---	6.42	7.95	---	---	---	68.9	---	---	---	82.6
Flumequine	TOT	ng/L	---	---	<3.75	<1.87	---	---	<6.19	<2.58	---	---	---	<2.59	---	---	---	<1.79
Fluoxetine	TOT	ng/L	---	---	76.1	44.1	---	---	45.2	60.6	---	---	---	44.3	---	---	---	28.9
Furosemide	TOT	ng/L	---	---	1310	1000	---	---	1830	1950	---	---	1,340	1,440	---	---	1,360	542
Gemfibrozil	TOT	ng/L	---	---	72.9	20.9	---	---	15.6	23.7	---	---	12.7	18.5	---	---	128	82.6
Glipizide	TOT	ng/L	---	---	<2.4	<0.786	---	---	<3.87	<2.34	---	---	<2.38	<2.37	---	---	<0.762	<0.778
Glyburide	TOT	ng/L	---	---	<2.4	1.97	---	---	2.59	3.22	---	---	3.15	3.58	---	---	2.36	2.43
Hydrochlorothiazide	TOT	ng/L	---	---	2350	1870	---	---	2,650	2,900	---	---	2,300	2,330	---	---	2,230	2,210
Ibuprofen	TOT	ng/L	---	---	14,600	11.7	---	---	17,700	2,800	---	---	15,100	378	---	---	19,700	141
Lincomycin	TOT	ng/L	---	---	<3	<2.95	---	---	<2.9	<2.92	---	---	---	<2.97	---	---	---	<2.92
Lomefloxacin	TOT	ng/L	---	---	<3	<2.95	---	---	<5.13	<5.6	---	---	---	<3.09	---	---	---	<2.92
Miconazole	TOT	ng/L	---	---	29	2.2	---	---	<5.5	3.9	---	---	---	5.22	---	---	---	1.68
Naproxen	TOT	ng/L	---	---	10,400	256	---	---	12,000	251	---	---	13,100	1,260	---	---	9,590	589
Norfloxacin	TOT	ng/L	---	---	<74.3	<14.7	---	---	<86.8	<27.7	---	---	---	<96.2	---	---	---	<23.5
Norgestimate	TOT	ng/L	---	---	<22.2	<22.4	---	---	<50.6	<6.85	---	---	---	<2.97	---	---	---	<2.92
Ofloxacin	TOT	ng/L	---	---	<5.03	3.81	---	---	<2.53	15.8	---	---	---	7.72	---	---	---	15.1
Ormetoprim	TOT	ng/L	---	---	<2	<1.97	---	---	<1.74	<0.78	---	---	---	<0.593	---	---	---	1.99
Oxacillin	TOT	ng/L	---	---	<5.13	<4.13	---	---	<4.35	<2.92	---	---	---	<2.97	---	---	---	<3.82
Oxolinic Acid	TOT	ng/L	---	---	<4.77	<2.3	---	---	<7.83	<3.99	---	---	---	<5.02	---	---	---	<2.07
Penicillin G	TOT	ng/L	---	---	3.22	<2.95	---	---	<6.11	<2.92	---	---	---	<9.89	---	---	---	<2.92
Penicillin V	TOT	ng/L	---	---	<3.42	<2.95	---	---	<3.44	<3.3	---	---	---	<2.97	---	---	---	<2.92
Roxithromycin	TOT	ng/L	---	---	<1.72	<1.7	---	---	<1.47	<1.14	---	---	---	<0.412	---	---	---	<0.306
Sarafloxacin	TOT	ng/L	---	---	<24.8	<14.7	---	---	<14.5	<14.6	---	---	---	<14.8	---	---	---	<14.6
Sulfachloropyridazine	TOT	ng/L	---	---	<1.5	<2.18	---	---	<5.56	<3.57	---	---	---	<1.48	---	---	---	<1.46
Sulfadiazine	TOT	ng/L	---	---	<2.01	<1.47	---	---	<4.71	<2.38	---	---	---	<1.62	---	---	---	<1.46
Sulfadimethoxine	TOT	ng/L	---	---	4.16	<0.902	---	---	11.3	2.82	---	---	---	38.7	---	---	---	<1.46
Sulfamerazine	TOT	ng/L	---	---	82.7	56.2	---	---	<3.57	<2.73	---	---	---	<1.42	---	---	---	<0.937
Sulfamethazine	TOT	ng/L	---	---	<9.7	<1.94	---	---	<9.29	<4.99	---	---	---	<3.79	---	---	---	<1.31
Sulfamethizole	TOT	ng/L	---	---	<5.34	<0.93	---	---	<0.581	<0.584	---	---	---	<0.593	---	---	---	<0.679
Sulfamethoxazole	TOT	ng/L	---	---	1850	1080	---	---	2110	746	---	---	---	624	---	---	---	234
Sulfanilamide	TOT	ng/L	---	---	<15	85.7	---	---	20.4	53.5	---	---	---	28.2	---	---	---	29.5
Sulfathiazole	TOT	ng/L	---	---	<2.84	<1.47	---	---	<3.24	<1.76	---	---	---	<1.54	---	---	---	<1.46
Thiabendazole	TOT	ng/L	---	---	22.3	19	---	---	33.3	31.2	---	---	---	31.4	---	---	---	17.4

Appendix B4, cont'd

Parameter			Jan. 19 2021		Jan. 20 2021		Jan. 21 2021		Apr. 15 2021		Jul. 14 2021		Jul. 15 2021		Jul. 16 2021		Oct. 7 2021	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Triclocarban	TOT	ng/L	---	---	6.27	0.508	---	---	6.28	1.94	---	---	5.45	<1.19	---	---	2.43	0.785
Triclosan	TOT	ng/L	---	---	86.8	12.9	---	---	126	30.2	---	---	135	42.4	---	---	63.7	23.8
Trimethoprim	TOT	ng/L	---	---	434	485	---	---	410	468	---	---	---	432	---	---	---	404
Tylosin	TOT	ng/L	---	---	38.5	11.8	---	---	<15	25.3	---	---	---	237	---	---	---	22.3
Virginiamycin	TOT	ng/L	---	---	<3	<2.95	---	---	<58.3	<13.3	---	---	---	<5.63	---	---	---	<7.59
Warfarin	TOT	ng/L	---	---	7.11	4.64	---	---	8.25	9.1	---	---	7.66	7.38	---	---	6.84	6.33
17 beta-Estradiol 3-benzoate	TOT	ng/L	---	---	<1.12	<0.786	---	---	1.1	<0.779	---	---	<0.908	<0.791	---	---	---	<0.778
Allyl Trenbolone	TOT	ng/L	---	---	<3.39	<0.663	---	---	<1.66	<0.718	---	---	<4.46	<0.737	---	---	---	<0.394
Androstenedione	TOT	ng/L	---	---	56.4	3.46	---	---	56	1.06	---	---	-999	4.03	---	---	---	10.6
Androsterone	TOT	ng/L	---	---	-999	<92.5	---	---	-999	-999	---	---	-999	<72	---	---	---	<145
Desogestrel	TOT	ng/L	---	---	<133	<40.9	---	---	<63.8	<40.5	---	---	<206	<41.1	---	---	---	49.6
Mestranol	TOT	ng/L	---	---	-999	<19.7	---	---	<180	<19.5	---	---	<429	<28	---	---	---	<27.6
Norethindrone	TOT	ng/L	---	---	<4.65	<0.983	---	---	<2.56	<0.974	---	---	<9.18	<3.4	---	---	---	<1.53
norgestrel	TOT	ng/L	---	---	<19.4	<2.1	---	---	<30.7	<2.45	---	---	<16.1	<2.2	---	---	---	<3.09
Progesterone	TOT	ng/L	---	---	<2.35	<0.393	---	---	4.25	<0.389	---	---	48.1	<0.467	---	---	---	<0.389
Testosterone	TOT	ng/L	---	---	28.4	<0.415	---	---	86.1	<0.399	---	---	75.5	<0.72	---	---	---	<0.643
2,4 + 2,5 Dichlorophenol	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
2-Chlorophenol	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
4-Chloro-3-Methylphenol	TOT	µg/L	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1	---	---	<1	<1
Pentachlorophenol	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
2,4-dimethylphenol	TOT	µg/L	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
2,4-dinitrophenol	TOT	µg/L	---	---	<6.5	<6.5	---	---	<6.5	<6.5	---	---	<6.5	<6.5	---	---	<6.5	<6.5
2-Methyl-4,6-Dinitrophenol	TOT	µg/L	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
2-Nitrophenol	TOT	µg/L	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
Phenol	TOT	µg/L	---	---	14.5	<2.5	---	---	3.5	<2.5	---	---	21.3	<2.5	---	---	10.9	<2.5
Phenolic Compounds	TOT	mg/L	---	---	0.053	0.0048	---	---	0.063	0.0066	---	---	0.068	<0.0075	---	---	0.057	0.0027
2,4,6-trichlorophenol	TOT	µg/L	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5

Notes:
--- data not available

APPENDIX C

Surface Water / IDZ Monitoring

Appendix C1 SPTP Surface Water Stations

		Latitude	Longitude
Surface Water Stations	Outfall	48°37.3978	-123°23.1511'
	100N	48°37.4302	-123°23.1511'
	100S	48°37.3654	-123°23.1506'
	200NE	48°37.4440	-123°23.8221'
	200NW	48°37.4433	-123°23.2202'
	200SE	48°37.3522	-123°23.8160'
	200SW	48°37.3522	-123°23.2195'
	400E	48°37.3983	-123°22.5556'
	400N	48°37.5274	-123°23.1518'
	400S	48°37.2682	-123°23.1500'
	400W	48°37.3972	-123°23.3462'
	800N	48°38.5701	-123°23.1529'
	800S	48°37.1391	-123°23.1488'
	800W	48°37.3965	-123°23.5417'
	Reference 2	48°38.5496	-123°19.1139'
IDZ Stations	SP02	48°37.7179	-123°23.1816'
	SP03	48°37.6930	-123°23.1431'
	SP04	48°37.6576	-123°23.1365'
	SP05	48°37.6272	-123°23.1647'
	SP06	48°37.6137	-123°23.2149'
	SP07	48°37.6052	-123°23.2682'
	SP08	48°37.6088	-123°23.3218'
	SP09	48°37.6337	-123°23.3602'
	SP10	48°37.6691	-123°23.3668'
	SP11	48°37.6995	-123°23.3386'
	SP12	48°37.7130	-123°23.2884'
	SP13	48°37.7215	-123°23.2351'

Appendix C2 SPTP IDZ Sites Extended Sampling Results (one sampling day each season) 2021

		Aluminum (mg/L)		Antimony (mg/L)		Arsenic (mg/L)		Barium (mg/L)		Beryllium (mg/L)		Boron (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Cobalt (mg/L)		Copper (mg/L)		Iron (mg/L)		Lead (mg/L)		Magnesium (mg/L)	
		Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
WQ Guidelines						0.0125 mg/L *+#						1.2 mg/L		0.00012 mg/L (max) *						0.002 mg/L (mean of 5 samples) or 0.14 mg/L (max) *							
Station 1	Top	0.038	0.013	<0.001	<0.001	0.0017	0.0014	0.009	0.009	<0.0005	<0.0005	4.36	3.94	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	0.00052	0.048	0.017	0.0003	<0.00005	1,020	1,140
	Middle	0.041	0.041	<0.001	<0.001	0.0015	0.0016	0.009	0.009	<0.0005	<0.0005	4.51	3.87	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.054	0.056	0.0001	0.0001	980	1,230
	Bottom	0.051	0.032	<0.001	<0.001	0.0017	0.0016	0.009	0.010	<0.0005	<0.0005	4.49	3.8	0.0001	0.0001	<0.0005	<0.0005	0.000052	<0.00005	<0.0005	<0.0005	0.063	0.042	0.0001	0.0001	1,320	1,270
Station 2	Top	0.041	0.017	<0.001	<0.001	0.0016	0.0015	0.009	0.009	<0.0005	<0.0005	4.55	3.75	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.051	0.02	0.0001	<0.00005	1,240	1,180
	Middle	0.040	0.045	<0.001	<0.001	0.0015	0.0015	0.008	0.009	<0.0005	<0.0005	4.48	3.78	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	0.0023	0.055	0.06	0.0001	0.0001	1,210	1,220
	Bottom	0.051	0.042	<0.001	<0.001	0.0017	0.0015	0.009	0.009	<0.0005	<0.0005	4.47	3.74	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.063	0.057	0.0002	0.0001	1,280	1,220
Station 3	Top	0.072	0.019	<0.001	<0.001	0.0016	0.0015	0.009	0.009	<0.0005	<0.0005	4.57	3.6	0.0001	0.0001	<0.0005	<0.0005	0.000057	<0.00005	<0.0005	<0.0005	0.09	0.023	0.0002	0.0001	1,260	1,150
	Middle	0.048	0.042	<0.001	<0.001	0.0015	0.0015	0.009	0.009	<0.0005	<0.0005	2.8	3.8	0.0001	0.0001	0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.064	0.058	0.0001	0.0001	1,070	1,230
	Bottom	0.039	0.050	<0.001	<0.001	0.0015	0.0016	0.009	0.009	<0.0005	<0.0005	3.23	3.91	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.051	0.071	0.0001	0.0001	1,070	1,190
Station 4	Top	0.035	0.023	<0.001	<0.001	0.0015	0.0015	0.009	0.010	<0.0005	<0.0005	2.89	3.52	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.048	0.031	0.0002	0.0001	1,040	1,160
	Middle	0.050	0.041	<0.001	<0.001	0.0016	0.0016	0.009	0.009	<0.0005	<0.0005	2.86	3.7	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.069	0.054	0.0001	0.0001	1,070	1,200
	Bottom	0.055	0.061	<0.001	<0.001	0.0015	0.0016	0.009	0.009	<0.0005	<0.0005	2.88	3.69	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	0.00662	<0.0005	0.074	0.067	0.0013	0.0001	1,060	1,210
Reference 2	Top	0.022	0.027	<0.001	<0.001	0.0015	0.0016	0.009	0.010	<0.0005	<0.0005	2.82	3.57	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.028	0.052	0.0002	0.0001	1,040	1,190
	Middle	0.028	0.051	<0.001	<0.001	0.0016	0.0016	0.009	0.009	<0.0005	<0.0005	3.17	3.76	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	0.038	0.068	0.0001	0.0002	1,060	1,240
	Bottom	0.029	0.067	<0.001	<0.001	0.0016	0.0016	0.009	0.009	<0.0005	<0.0005	2.86	3.76	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	0.00062	0.036	0.084	0.0001	0.0016	1,030	1,240
Average IDZ Stations	Top	0.047	0.018	<0.001	<0.001	0.0016	0.0015	0.009	0.009	<0.0005	<0.0005	4.09	3.70	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	0.0003	0.059	0.023	0.0002	0.0001	1,140	1,158
	Middle	0.045	0.042	<0.001	<0.001	0.0015	0.0016	0.009	0.009	<0.0005	<0.0005	3.66	3.79	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	<0.0005	0.0008	0.061	0.057	0.0001	0.0001	1,083	1,220
	Bottom	0.049	0.046	<0.001	<0.001	0.0016	0.0016	0.009	0.009	<0.0005	<0.0005	3.77	3.79	0.0001	0.0001	<0.0005	<0.0005	<0.00005	<0.00005	0.0018	<0.0005	0.063	0.059	0.0004	0.0001	1,183	1,223

Notes:
Shaded cells indicate exceedance to BC WQG (see Appendix C2)
* = BC Approved Water Quality Guideline
+ = BC Working Water Quality Guideline
# = CCME Water Quality Guideline for the Protection of Aquatic Life

Appendix C2, continued

		Manganese (mg/L)		Mercury (mg/L)		Molybdenum (mg/L)		Nickel (mg/L)		Potassium (mg/L)		Selenium (mg/L)		Silver (mg/L)		Strontium (mg/L)		Tin (mg/L)		Titanium (mg/L)		Uranium (mg/L)		Zinc (mg/L)	
		Winter	summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
WQ Guidelines								0.0071 mg/L *				0.002 mg/L *		0.0015 mg/L (mean of 5 samples) or 0.003 mg/L (max) *										0.01 mg/L (mean of 5 samples) *	
Station 1	Top	0.003	0.003	0.002	<0.0019	0.01	0.01	<0.0005	<0.0005	392	370	<0.0005	<0.0005	<0.0001	<0.0001	7.1	6.51	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Middle	0.003	0.004	0.003	<0.0019	0.01	0.01	<0.0005	<0.0005	373	407	<0.0005	<0.0005	<0.0001	<0.0001	7.14	6.92	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Bottom	0.003	0.004	<0.0019	<0.0019	0.01	0.01	<0.0005	0.00085	405	424	<0.0005	<0.0005	<0.0001	<0.0001	6.84	7.03	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
Station 2	Top	0.003	0.003	0.003	<0.0019	0.01	0.01	<0.0005	<0.0005	392	392	<0.0005	<0.0005	<0.0001	<0.0001	6.67	6.81	<0.001	<0.001	<0.005	<0.005	0.002	0.002	<0.003	<0.003
	Middle	0.003	0.003	0.003	<0.0019	0.01	0.01	<0.0005	0.00053	384	403	<0.0005	<0.0005	<0.0001	<0.0001	6.56	7.08	<0.001	<0.001	<0.005	<0.005	0.002	0.003	<0.003	<0.003
	Bottom	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	<0.0005	416	407	<0.0005	<0.0005	<0.0001	<0.0001	7.03	6.86	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
Station 3	Top	0.003	0.003	0.003	<0.0019	0.01	0.01	<0.0005	<0.0005	419	383	<0.0005	<0.0005	<0.0001	<0.0001	6.91	6.65	<0.001	<0.001	<0.005	<0.005	0.003	0.002	0.0052	<0.003
	Middle	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	<0.0005	378	409	<0.0005	<0.0005	<0.0001	<0.0001	6.07	6.94	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Bottom	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	0.0005	377	384	<0.0005	<0.0005	<0.0001	<0.0001	6.28	6.85	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
Station 4	Top	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	<0.0005	376	392	<0.0005	<0.0005	<0.0001	<0.0001	6.04	6.59	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Middle	0.003	0.003	0.002	<0.0019	0.01	0.01	<0.0005	<0.0005	392	406	<0.0005	<0.0005	<0.0001	<0.0001	6.08	7.03	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Bottom	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	0.00054	384	406	<0.0005	<0.0005	<0.0001	<0.0001	6.16	7.04	<0.001	<0.001	<0.005	<0.005	0.003	0.002	0.008	<0.003
Reference 2	Top	0.003	0.003	<0.0019	<0.0019	0.01	0.01	<0.0005	<0.0005	382	399	<0.0005	<0.0005	<0.0001	<0.0001	6.03	6.9	<0.001	<0.001	<0.005	<0.005	0.002	0.002	<0.003	<0.003
	Middle	0.003	0.003	<0.0019	<0.0019	0.01	0.01	<0.0005	<0.0005	385	419	<0.0005	<0.0005	<0.0001	<0.0001	6.14	7.17	<0.001	<0.001	<0.005	<0.005	0.003	0.003	<0.003	<0.003
	Bottom	0.003	0.003	<0.0019	<0.0019	0.01	0.01	<0.0005	<0.0005	382	427	<0.0005	<0.0005	<0.0001	<0.0001	6.23	7.17	<0.001	<0.001	<0.005	<0.005	0.002	0.002	0.0032	0.0052
Average IDZ Stations	Top	0.003	0.003	0.003	<0.0019	0.01	0.01	<0.0005	<0.0005	395	384	<0.0005	<0.0005	<0.0001	<0.0001	6.68	6.64	<0.001	<0.001	<0.005	<0.005	0.003	0.002	0.0024	<0.003
	Middle	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	0.00015	382	406	<0.0005	<0.0005	<0.0001	<0.0001	6.46	6.99	<0.001	<0.001	<0.005	<0.005	0.003	0.002	<0.003	<0.003
	Bottom	0.003	0.004	0.002	<0.0019	0.01	0.01	<0.0005	0.00048	396	405	<0.0005	<0.0005	<0.0001	<0.0001	6.58	6.95	<0.001	<0.001	<0.005	<0.005	0.003	0.002	0.0031	<0.003

Notes:
Shaded cells indicate exceedance to BC WQG (see Appendix C2)
* = BC Approved Water Quality Guideline
+ = BC Working Water Quality Guideline
# = CCME Water Quality Guideline for the Protection of Aquatic Life

Appendix C3 SPTP IDZ Sites Nutrient Monitoring Results (1st to 5th day of sampling) 2021

NH3 mg/L – 2021							
	BC Approved WQG = 23-33 mg/L N (average over 5 samples) or 3.4-5.0 mg/L N (maximum)						
		Winter					Average
Reference	Top	0.076	0.066	0.075	0.068	0.072	0.071
	Middle	0.074	0.054	0.078	0.068	0.067	0.068
	Bottom	0.079	0.060	0.069	0.074	0.059	0.068
Station 1	Top	0.046	0.063	0.050	0.076	0.067	0.060
	Middle	0.041	0.069	0.076	0.069	0.066	0.064
	Bottom	0.036	0.055	0.050	0.081	0.067	0.058
Station 2	Top	0.037	0.072	0.053	0.082	0.067	0.062
	Middle	0.034	0.070	0.058	0.071	0.069	0.060
	Bottom	0.039	0.066	0.058	0.069	0.063	0.059
Station 3	Top	0.043	0.069	0.075	0.073	0.065	0.065
	Middle	0.037	0.060	0.067	0.080	0.070	0.063
	Bottom	0.037	0.076	0.074	0.082	0.076	0.069
Station 4	Top	0.036	0.070	0.077	0.081	0.067	0.066
	Middle	0.044	0.069	0.078	0.071	0.074	0.067
	Bottom	0.032	0.063	0.056	0.069	0.056	0.055
		Summer					Average
Reference	Top	0.096	0.160	0.086	0.096	0.073	0.102
	Middle	0.083	0.062	0.099	0.089	0.089	0.084
	Bottom	0.088	0.063	0.085	0.093	0.100	0.086
Station 1	Top	0.100	0.096	0.100	0.082	0.076	0.091
	Middle	0.092	0.083	0.092	0.110	0.087	0.093
	Bottom	0.093	0.080	0.093	0.097	0.110	0.095
Station 2	Top	0.095	0.096	0.094	0.087	0.085	0.091
	Middle	0.084	0.082	0.098	0.099	0.095	0.092
	Bottom	0.098	0.088	0.094	0.100	0.120	0.100
Station 3	Top	0.084	0.090	0.097	0.080	0.082	0.087
	Middle	0.085	0.086	0.092	0.091	0.100	0.091
	Bottom	0.095	0.089	0.110	0.091	0.110	0.099
Station 4	Top	0.090	0.100	0.080	0.083	0.089	0.088
	Middle	0.087	0.077	0.097	0.100	0.090	0.090
	Bottom	0.089	0.083	0.110	0.100	0.100	0.096

Notes:

WQG calculated from BC Approved Water Quality Guidelines Summary Report, Table 26E (long-term/average) and Table 26F (short-term acute/maximum). Values used for calculations are 30ppt salinity, 10°C, and pH of 8

Appendix C3, continued

PO_4 Phosphate Total mg/L – 2021							
		Winter					Average
Reference	Top	1.400	0.053	0.046	0.054	0.050	0.321
	Middle	0.064	0.055	0.047	0.043	0.052	0.052
	Bottom	0.056	0.053	0.051	0.047	0.048	0.051
Station 1	Top	0.060	0.045	0.050	0.044	0.030	0.046
	Middle	0.047	0.050	0.052	0.048	0.042	0.048
	Bottom	0.061	0.046	0.045	0.049	0.048	0.050
Station 2	Top	0.061	0.052	0.057	0.048	0.048	0.053
	Middle	0.060	0.054	0.054	0.042	0.048	0.052
	Bottom	0.061	0.055	0.046	0.033	0.044	0.048
Station 3	Top	0.062	0.043	0.050	0.044	0.049	0.050
	Middle	0.058	0.042	0.046	0.038	0.052	0.047
	Bottom	0.061	0.053	0.045	0.045	0.045	0.050
Station 4	Top	0.061	0.049	0.050	0.043	0.054	0.051
	Middle	0.059	0.058	0.045	0.054	0.055	0.054
	Bottom	0.061	0.045	0.048	0.042	0.042	0.048
		Summer					Average
Reference	Top	0.033	0.050	0.044	0.036	0.026	0.038
	Middle	0.046	0.060	0.055	0.047	0.049	0.051
	Bottom	0.033	0.057	0.047	0.041	0.049	0.045
Station 1	Top	0.028	0.039	0.046	0.034	0.021	0.034
	Middle	0.008	0.052	0.055	0.042	0.022	0.036
	Bottom	0.052	0.047	0.052	0.040	0.048	0.048
Station 2	Top	0.035	0.034	0.054	0.045	0.024	0.038
	Middle	0.042	0.045	0.055	0.047	0.027	0.043
	Bottom	0.044	0.053	0.055	0.042	0.048	0.048
Station 3	Top	0.028	0.045	0.053	0.044	0.017	0.037
	Middle	0.042	0.058	0.063	0.042	0.029	0.047
	Bottom	0.050	0.055	0.059	0.043	0.044	0.050
Station 4	Top	0.033	0.044	0.051	0.041	0.039	0.042
	Middle	0.042	0.055	0.053	0.043	0.044	0.047
	Bottom	0.043	0.058	0.057	0.040	0.027	0.045

Appendix C3, continued

Total Suspended Solids mg/L – 2021							
		Winter					Average
Reference	Top	8.8	9.2	8.0	15.0	2.8	8.76
	Middle	38.0	4.0	5.6	24.0	2.8	14.88
	Bottom	42.0	2.8	6.4	16.0	4.0	14.24
Station 1	Top	<1	14.0	<1	20.0	4.0	7.80
	Middle	<1	36.0	1.2	15.0	7.2	11.98
	Bottom	4.8	29.0	<1	18.0	3.6	11.18
Station 2	Top	2.0	39.0	1.2	21.0	3.6	13.36
	Middle	9.2	39.0	2.4	15.0	4.8	14.08
	Bottom	5.6	7.6	1.6	15.0	3.2	6.60
Station 3	Top	8.0	<1	1.2	31.0	2.8	8.70
	Middle	1.6	3.2	1.6	25.0	3.2	6.92
	Bottom	<1	24.0	1.2	18.0	4.0	9.54
Station 4	Top	<1	4.4	<1	26.0	<1	6.38
	Middle	<1	1.6	1.2	22.0	2.4	5.54
	Bottom	<1	5.2	<1	20.0	6.0	6.44
		Summer					Average
Reference	Top	6.4	2.4	1.6	50.0	33.0	18.68
	Middle	<1	3.6	5.2	51.0	30.0	18.06
	Bottom	4.0	2.4	4.0	45.0	32.0	17.48
Station 1	Top	3.6	4.0	24.0	48.0	32.0	22.32
	Middle	7.2	2.4	6.0	40.0	54.0	21.92
	Bottom	12.0	3.6	7.6	33.0	46.0	20.44
Station 2	Top	3.6	2.0	6.0	39.0	46.0	19.32
	Middle	8.8	2.8	2.8	35.0	44.0	18.68
	Bottom	9.2	15.0	9.6	26.0	28.0	17.56
Station 3	Top	6.4	3.2	2.4	18.0	51.0	16.20
	Middle	2.4	2.0	2.0	22.0	42.0	14.08
	Bottom	1.6	3.6	4.0	29.0	24.0	12.44
Station 4	Top	<1	2.4	3.2	25.0	32.0	12.62
	Middle	3.2	2.4	4.8	26.0	28.0	12.88
	Bottom	3.2	1.6	4.0	22.0	48.0	15.76

Appendix C3, continued

TKN mg/L – 2021							
		Winter					Average
Reference	Top	0.148	<0.2	0.069	0.115	0.109	0.108
	Middle	0.141	<0.02	0.054	0.113	0.078	0.079
	Bottom	0.163	<0.2	0.051	0.114	0.091	0.104
Station 1	Top	0.082	<0.2	0.029	0.110	0.102	0.085
	Middle	0.098	<0.2	0.056	0.096	0.070	0.084
	Bottom	<0.2	<0.02	0.036	0.138	0.115	0.080
Station 2	Top	<0.2	<0.2	0.026	0.143	0.068	0.087
	Middle	<0.2	<0.02	0.030	0.146	0.136	0.084
	Bottom	0.059	0.035	0.031	0.112	0.085	0.064
Station 3	Top	<0.2	<0.02	0.052	0.120	0.105	0.077
	Middle	0.140	<0.02	0.031	0.136	0.082	0.080
	Bottom	0.068	<0.02	0.047	0.132	0.095	0.070
Station 4	Top	0.082	<0.2	0.056	0.121	0.101	0.092
	Middle	<0.2	<0.2	0.074	0.137	0.092	0.101
	Bottom	0.066	0.023	0.023	0.166	0.111	0.078
		Summer					**Average**
Reference	Top	0.182	0.156	0.202	0.173	0.095	0.162
	Middle	0.181	0.098	0.190	0.166	0.086	0.144
	Bottom	0.169	0.100	0.213	0.145	0.081	0.142
Station 1	Top	0.302	0.182	0.181	0.172	0.119	0.191
	Middle	0.182	0.179	0.233	0.134	0.089	0.163
	Bottom	0.196	0.171	0.215	0.136	0.106	0.165
Station 2	Top	0.208	0.158	0.194	0.234	0.147	0.188
	Middle	0.142	0.138	0.151	0.316	0.114	0.172
	Bottom	0.147	0.133	0.131	0.551	0.099	0.212
Station 3	Top	0.178	0.162	0.155	0.934	0.131	0.312
	Middle	0.176	0.111	0.135	0.236	0.117	0.155
	Bottom	0.248	0.121	0.139	0.187	0.107	0.160
Station 4	Top	0.176	0.132	0.167	0.235	0.193	0.181
	Middle	0.132	0.086	0.136	0.217	0.214	0.157
	Bottom	0.232	0.118	0.161	0.194	0.086	0.158

Appendix C3, continued

Sulphate mg/L – 2021							
		Winter					**Average**
Reference	Top	2,200	2,400	2,000	2,400	2,500	2,300
	Middle	2,300	2,400	2,100	2,400	2,500	2,340
	Bottom	2,300	2,400	2,300	2,300	2,700	2,400
Station 1	Top	2,300	2,800	2,100	2,300	2,600	2,420
	Middle	2,300	2,400	2,100	2,400	2,300	2,300
	Bottom	2,300	2,400	2,100	2,400	2,500	2,340
Station 2	Top	2,300	2,300	2,100	2,300	2,300	2,260
	Middle	2,300	2,800	2,000	2,400	2,400	2,380
	Bottom	2,300	2,400	2,200	2,400	2,400	2,340
Station 3	Top	2,300	2,400	2,200	2,400	2,700	2,400
	Middle	2,300	2,400	2,100	2,400	2,300	2,300
	Bottom	2,300	2,400	2,000	2,500	2,300	2,300
Station 4	Top	2,300	2,400	2,100	2,300	2,700	2,360
	Middle	2,300	2,400	1,900	2,400	2,400	2,280
	Bottom	2,300	2,300	2,100	2,300	2,800	2,360
		Summer					**Average**
Reference	Top	2,200	2,900	2,600	2,700	2,400	2,560
	Middle	2,500	3,100	2,300	2,300	2,400	2,520
	Bottom	2,300	2,700	2,600	2,100	2,600	2,460
Station 1	Top	2,800	2,300	2,300	2,100	2,400	2,380
	Middle	2,700	2,500	2,000	2,400	2,300	2,380
	Bottom	2,700	2,200	2,400	2,400	2,100	2,360
Station 2	Top	2,700	2,800	2,100	2,100	2,300	2,400
	Middle	2,300	2,800	2,600	2,100	2,100	2,380
	Bottom	2,300	2,700	2,500	2,200	2,300	2,400
Station 3	Top	2,000	2,200	2,500	2,500	2,100	2,260
	Middle	2,000	2,000	2,300	2,400	2,400	2,220
	Bottom	2,000	2,200	2,200	2,100	2,200	2,140
Station 4	Top	2,400	2,400	2,100	2,000	2,300	2,240
	Middle	2,800	3,000	2,600	2,100	2,500	2,600
	Bottom	2,400	2,600	2,400	2,400	2,200	2,400

Appendix C3, continued

Nitrate Nitrogen mg/L – 2021							
	BC Approved WQG = 3.7 mg/L (average over 5 samples)						
		Winter					Average
Reference	Top	0.322	0.407	0.332	0.284	0.320	0.333
	Middle	0.335	0.412	0.378	0.283	0.325	0.347
	Bottom	0.341	0.408	0.396	0.279	0.328	0.350
Station 1	Top	0.362	0.399	0.376	0.288	0.310	0.347
	Middle	0.335	0.412	0.374	0.295	0.318	0.347
	Bottom	0.360	0.405	0.381	0.274	0.321	0.348
Station 2	Top	0.347	0.397	0.428	0.245	0.314	0.346
	Middle	0.365	0.406	0.401	0.241	0.293	0.341
	Bottom	0.365	0.405	0.389	0.291	0.324	0.355
Station 3	Top	0.354	0.398	0.406	0.269	0.316	0.349
	Middle	0.350	0.409	0.396	0.259	0.321	0.347
	Bottom	0.356	0.410	0.374	0.276	0.323	0.348
Station 4	Top	0.358	0.403	0.353	0.277	0.304	0.339
	Middle	0.354	0.404	0.362	0.287	0.319	0.345
	Bottom	0.357	0.406	0.389	0.282	0.299	0.347
		Summer					Average
Reference	Top	0.127	0.178	0.134	0.190	0.129	0.152
	Middle	0.195	0.290	0.214	0.244	0.214	0.231
	Bottom	0.186	0.293	0.219	0.291	0.239	0.246
Station 1	Top	0.105	0.120	0.141	0.141	0.079	0.117
	Middle	0.183	0.218	0.193	0.188	0.159	0.188
	Bottom	0.184	0.216	0.209	0.195	0.169	0.195
Station 2	Top	0.109	0.160	0.131	0.133	0.077	0.122
	Middle	0.209	0.259	0.196	0.205	0.129	0.200
	Bottom	0.194	0.250	0.201	0.195	0.198	0.208
Station 3	Top	0.110	0.152	0.159	0.143	0.079	0.129
	Middle	0.180	0.268	0.215	0.183	0.167	0.203
	Bottom	0.215	0.266	0.197	0.205	0.178	0.212
Station 4	Top	0.093	0.148	0.143	0.134	0.045	0.113
	Middle	0.199	0.274	0.202	0.184	0.150	0.202
	Bottom	0.203	0.273	0.207	0.190	0.177	0.210

Appendix C3, continued

Nitrite Nitrogen mg/L – 2021							
	BC Approved WQG = 3.7 mg/L (average over 5 samples)						
		Winter					Average
Reference	Top	0.002	0.002	0.003	0.003	0.003	0.002
	Middle	0.002	0.003	0.002	<0.002	0.002	0.002
	Bottom	0.002	0.002	0.002	0.003	0.002	0.002
Station 1	Top	0.003	0.003	0.002	0.002	0.002	0.003
	Middle	0.002	0.003	0.003	0.003	0.002	0.003
	Bottom	0.002	0.003	0.002	0.003	<0.002	0.002
Station 2	Top	<0.002	<0.002	0.003	0.003	0.003	0.002
	Middle	<0.002	0.003	0.003	0.002	0.002	0.002
	Bottom	0.002	0.002	0.003	0.003	<0.002	0.002
Station 3	Top	0.002	0.003	0.002	0.003	0.002	0.003
	Middle	<0.002	<0.002	0.003	0.002	<0.002	0.002
	Bottom	0.002	0.003	0.003	0.004	<0.002	0.002
Station 4	Top	0.002	0.002	0.002	0.003	0.003	0.002
	Middle	<0.002	<0.002	0.002	0.003	<0.002	0.002
	Bottom	0.002	0.003	0.003	0.002	0.003	0.002
		Summer					Average
Reference	Top	<0.002	0.002	<0.002	0.003	0.004	0.002
	Middle	0.003	<0.002	<0.002	0.002	0.004	0.002
	Bottom	0.003	0.004	<0.002	<0.002	0.005	0.003
Station 1	Top	0.002	<0.002	0.003	0.002	0.003	0.002
	Middle	0.003	0.003	0.003	0.007	0.004	0.004
	Bottom	0.003	0.002	0.003	0.003	0.004	0.003
Station 2	Top	0.003	0.004	0.002	0.003	0.003	0.003
	Middle	0.005	0.004	0.002	0.009	0.004	0.005
	Bottom	0.003	0.004	0.002	0.003	0.006	0.004
Station 3	Top	0.003	0.004	<0.002	0.002	0.002	0.002
	Middle	0.004	0.003	0.006	0.003	0.003	0.004
	Bottom	0.005	0.003	0.002	0.003	0.005	0.003
Station 4	Top	0.003	0.003	<0.002	0.002	0.002	0.002
	Middle	0.004	0.003	0.002	0.002	0.004	0.003
	Bottom	0.004	0.004	0.005	0.004	0.007	0.005

Appendix C3, continued

Salinity – 2021							
		Winter					Average
Reference	Top	29.0	30.0	29.0	30.0	30.0	29.6
	Middle	30.0	30.0	30.0	30.0	30.0	30.0
	Bottom	30.0	30.0	30.0	30.0	31.0	30.2
Station 1	Top	29.0	30.0	30.0	30.0	30.0	29.8
	Middle	30.0	30.0	30.0	30.0	30.0	30.0
	Bottom	30.0	30.0	30.0	30.0	30.0	30.0
Station 2	Top	30.0	30.0	30.0	30.0	30.0	30.0
	Middle	30.0	30.0	30.0	30.0	30.0	30.0
	Bottom	30.0	30.0	30.0	30.0	30.0	30.0
Station 3	Top	30.0	30.0	30.0	30.0	30.0	30.0
	Middle	30.0	30.0	30.0	30.0	30.0	30.0
	Bottom	30.0	30.0	30.0	30.0	30.0	30.0
Station 4	Top	30.0	30.0	29.0	30.0	30.0	29.8
	Middle	30.0	30.0	29.0	30.0	30.0	29.8
	Bottom	30.0	30.0	30.0	30.0	30.0	30.0
		Summer					Average
Reference	Top	28.9	29.6	29.6	29.2	28.1	29.1
	Middle	29.2	31.4	30.5	30.1	29.4	30.1
	Bottom	29.3	31.0	30.5	30.5	29.7	30.2
Station 1	Top	28.6	29.5	30.0	29.2	28.2	29.1
	Middle	29.2	30.4	30.2	29.7	29.2	29.7
	Bottom	29.4	30.6	30.2	29.9	29.4	29.9
Station 2	Top	28.7	29.5	30.0	28.9	28.2	29.1
	Middle	29.4	30.5	30.4	29.9	28.8	29.8
	Bottom	29.5	30.4	30.3	29.7	29.5	29.9
Station 3	Top	28.8	29.6	30.0	29.1	28.2	29.1
	Middle	29.4	30.5	30.2	29.9	29.1	29.8
	Bottom	29.4	30.5	30.2	29.9	29.4	29.9
Station 4	Top	28.7	29.5	30.0	29.2	28.5	29.2
	Middle	29.5	30.4	30.3	29.8	29.0	29.8
	Bottom	29.5	30.6	30.3	30.0	29.3	29.9

Appendix C3, continued

N Nitrogen Total mg/L – 2021							
		Winter					Average
Reference	Top	0.472	0.460	0.404	0.402	0.432	0.434
	Middle	0.477	0.435	0.434	0.396	0.404	0.429
	Bottom	0.506	0.460	0.449	0.395	0.421	0.446
Station 1	Top	0.447	0.310	0.408	0.400	0.414	0.396
	Middle	0.436	0.480	0.433	0.394	0.391	0.427
	Bottom	0.370	0.423	0.419	0.415	0.436	0.413
Station 2	Top	0.370	0.480	0.457	0.391	0.384	0.416
	Middle	0.370	0.403	0.433	0.390	0.432	0.406
	Bottom	0.426	0.442	0.423	0.406	0.408	0.421
Station 3	Top	0.410	0.401	0.460	0.392	0.423	0.417
	Middle	0.490	0.419	0.430	0.398	0.402	0.428
	Bottom	0.426	0.414	0.423	0.411	0.418	0.418
Station 4	Top	0.441	0.490	0.411	0.401	0.408	0.430
	Middle	0.420	0.510	0.438	0.427	0.411	0.441
	Bottom	0.425	0.432	0.414	0.451	0.412	0.427
		Summer					Average
Reference	Top	0.309	0.337	0.336	0.365	0.228	0.315
	Middle	0.379	0.388	0.403	0.413	0.304	0.377
	Bottom	0.359	0.397	0.431	0.436	0.325	0.390
Station 1	Top	0.409	0.303	0.325	0.315	0.200	0.310
	Middle	0.368	0.399	0.430	0.330	0.253	0.356
	Bottom	0.383	0.389	0.428	0.334	0.279	0.363
Station 2	Top	0.319	0.321	0.327	0.370	0.227	0.313
	Middle	0.356	0.402	0.349	0.529	0.247	0.377
	Bottom	0.345	0.387	0.335	0.748	0.303	0.424
Station 3	Top	0.290	0.317	0.314	1.080	0.213	0.443
	Middle	0.359	0.382	0.356	0.421	0.287	0.361
	Bottom	0.467	0.390	0.338	0.395	0.289	0.376
Station 4	Top	0.271	0.284	0.310	0.371	0.241	0.295
	Middle	0.334	0.363	0.340	0.403	0.367	0.361
	Bottom	0.439	0.395	0.373	0.387	0.270	0.373

Appendix C3, continued

Sulfide mg/L – 2021							
		Winter					Average
Reference	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 1	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	0.0046	<0.0018	0.002
Station 2	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 3	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 4	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
		Summer					Average
Reference	Top	<0.0018	<0.0018	<0.0018	<0.0018	0.022	0.005
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 1	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 2	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	0.004	<0.0018	0.002
	Bottom	<0.0018	<0.0018	0.002	<0.0018	<0.0018	0.001
Station 3	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 4	Top	<0.0018	<0.0018	<0.0018	<0.0018	0.003	0.001
	Middle	<0.0018	<0.0018	0.017	<0.0018	<0.0018	0.004
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018

Appendix C3, continued

Total Organic Carbon mg/L – 2021							
		Winter					Average
Reference	Top	73	74	55	64	72	68
	Middle	72	93	63	70	71	74
	Bottom	73	73	64	76	78	73
Station 1	Top	96	88	68	57	80	78
	Middle	100	76	69	59	79	77
	Bottom	100	70	65	67	66	74
Station 2	Top	95	88	66	61	63	75
	Middle	100	84	66	59	73	76
	Bottom	99	88	61	68	72	78
Station 3	Top	95	77	51	57	71	70
	Middle	91	68	57	66	76	72
	Bottom	91	98	55	69	72	77
Station 4	Top	92	99	61	71	67	78
	Middle	93	73	64	68	70	74
	Bottom	96	70	65	65	69	73
		Summer					Average
Reference	Top	<200	430	140	240	150	212
	Middle	<200	<50	<50	290	<50	93
	Bottom	<200	450	100	280	170	220
Station 1	Top	<200	470	190	270	<50	211
	Middle	<200	410	820	280	<50	327
	Bottom	220	<50	<50	270	180	144
Station 2	Top	<200	230	<50	260	<50	128
	Middle	<200	450	240	280	180	250
	Bottom	<200	440	810	280	<50	331
Station 3	Top	<200	500	720	260	160	348
	Middle	<200	490	<50	310	170	219
	Bottom	<200	420	<50	250	<50	164
Station 4	Top	<200	180	<50	290	<50	124
	Middle	<200	490	<50	310	<50	190
	Bottom	<200	460	<50	290	<50	180