Supporting Document 1-4

Surface Water Quality Existing Conditions Report

Eastern Ontario Waste Handling Facility Future Development Environmental Assessment

GFL Environmental Inc.

Moose Creek, Ontario

October 11, 2022

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Part A

2019 and 2020

GFL Eastern Ontario Waste Handling Facility Expansion - Surface Water Existing Conditions Report

Prepared for

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Submitted by
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Executive Summary

CanDetec Inc. (CanDetec) was contracted by GFL Environmental Inc. (GFL) initially in 2018, to assist with the surface water monitoring program for the existing landfill operation and to develop a monitoring program for characterizing baseline aquatic quality and quantity based on data from 2019 and 2020 for the future expansion of the Eastern Ontario Waste Handling Facility (EOWHF). The proposed 240 ha landfill "expansion site" is immediately to the east of the existing landfill and is bounded by Concession Road 7 to the north, Highway 138 to the east, Laflèche Road to the south, and the Fraser Drain to the west. An Environmental Assessment (EA) study is being completed in support of the proposed landfill expansion. Establishing the existing surface water conditions at the site is required as part of the EA study in order to investigate the potential impacts of the development on the receiving surface drainage systems.

Phase 1 of the existing landfill generates leachate which is recovered and treated on site for discharge to Fraser Drain approximately 600 m upstream of the confluence with Moose Creek. The Phase 2 expansion of the existing landfill will result in the increased production of landfill leachate. The availability of the leachate treatment infrastructure at the existing EOWHF site will be utilized for treatment of leachate from the "expansion site" and consequently, the surface water study area is defined as the Moose Creek and Fraser Drain watersheds as well as the Upper-Tayside drain that feeds into the Scotch River watershed.

Water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow information for the water courses. The initial review of the historical data demonstrated that:

i. Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near EOWHF;

ii. Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any overlap with periodic treated effluent discharge events in Fraser Drain and Moose Creek;

iii. Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018; and

iv. Since May 2019, in part in response to the need for baseline condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters and the potential effect of the Phase 2 of the existing landfill, water quality and quantity monitoring in the receiving waters was enhanced in 2019 and again in 2020.

The purpose of this report is therefore to characterize existing conditions of the surface waters with respect to quality in the vicinity of the existing landfill and the expansion site. All sampling locations on Fraser Drain upstream of the effluent discharge location were considered as existing conditions for the period of record of data. Similarly, Moose Creek sites upstream of the confluence with Fraser Drain were considered as existing conditions including the Albert Fahey Award Drain site as well as the Legault-Tayside drain. The Fraser Drain downstream of the effluent discharge location and Moose Creek below the confluence with Fraser Drain were considered in three periods to assess trends or changes as a result of the effluent discharge. These periods are pre-discharge (1996 to 2007), early discharge without an emphasis on alignment with discharge events monitoring (2007 to 2018) and 2019 and 2020 monitoring intended to be synoptic monitoring with treated effluent discharge events.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in impacts on water quality in these water courses and an altered hydrology which have significantly affected existing conditions *vis a vis* natural or historic conditions. Historic conditions will not be emphasized in this report.

General time trends for upstream Fraser Drain stations SWFD4, SWFD3, and SWFD2 for the period of record show increased concentrations for sulphate (SO_4), chloride (Cl), iron (Fe), sodium (Na), ammonia as nitrogen (NH_3-N) and total phosphorus (TP) at most of the sample locations. The high variability over time for concentrations with these samples is likely associated with flow but there are insufficient data to assess the effects of low and high flows on water quality. However, data from two sampling periods were considered; Group A represents the early data prior to May 22, 2019 while Group B represents the most recent subset of samples collected from May 23, 2019 to Dec. 9, 2020. Median concentrations for SWFD4 (the most upstream station) compared for Group A and for the most recent Group B samples have doubled for boron (B) (0.010 for Group A to 0.020 mg/L for Group B), tripled for nitrate (NO_3-N) (0.885 to 2.245 mg/L for Group A and B, respectively) and increased by 10 mg/L for Cl (17.5 to 27.0 mg/L for Group A and B respectively) but have decreased slightly for NH_3-N and TP.

In general, median concentrations for SWFD3 Group B (2019-05-23 to 2020-12-09) have increased noticeably for Cl (17.0 to 31.0 mg/L for Group A and B respectively) and have increased for Na (12.0 to 17.0 mg/L for Group A and B respectively), NO_3-N (0.96 to 1.98 mg/L for Group A and B, respectively), TP (0.050 to 0.060 for Group A and B, respectively) and SO_4 (33.0 to 55.0 for Group A and B, respectively).

The concentration trend described here for stations that are considered to be unaffected by the existing landfill (i.e. on Fraser Drain but upstream of the landfill) may be the result of the changes in the sampling regime that occurred as of May 23, 2019 and or typify actual water quality degradation over the 24 years of record. The 2019 and 2020 sampling was conducted more frequently and included representative high flow events. Baseline median concentrations in Fraser Drain for the period of record exceed Provincial Water Quality Objectives (PWQO) for Fe and TP while the 90th percentiles exceeded the Canadian Water Quality Guideline (CWQG) for NO_3-N and the PWQO for Fe and TP.

Three stations were selected for evaluation of baseline or background conditions in Moose Creek including SWMC1 above the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1,500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek, and SWMC3 downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1. SWMC3 has been sampled only since May 2019. It was observed that there is little change in quality between SWMC3 and SWMC2 for Group B samples (i.e., data from 2019-05-23 to 2020-12-09). Aggregated data generally show little change between the two sampling periods (pre- and post- 2020-05-23) at SWMC1 whereas at SWMC2 (upstream) all variables are similar between the two time periods except for NO_3-N which increased in Group B (post 2020-05-23) while TP was significantly lower in Group B than in the earlier data set. The patterns noted for NO_3-N and TP are not present downstream at SWMC1. Detailed time series plots for key variables for the three Moose Creek background stations indicate that SO_4 shows a rising trend both for the past two years at SWMC3 and for the past 14 years at SWMC2 and SWMC1. Concentrations are now of the order of 80 to 100 mg/L as background. Cl, Na, B and NO_3-N all show a slight upward trend over the period of record.

The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables show no trends for the last 20 months. SWAF1 median and 90th percentile water quality statistics were compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain. It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH_3-N and TP especially relative to samples from the last 20 months of monitoring. B, Fe and TP are an order of magnitude higher than SWMC2 for the period May 23, 2019 to Dec. 9, 2020. Observations have indicated that the continuous flow at SWAF1 is largely associated with drainage waters from the peat and natural forested areas which are more representative

of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO_3-N and SO_4 than the Albert-Fahey Award Drain. Median concentrations for SWAF1 exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e., pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert-Fahey Award Drain with higher concentrations of B, Fe, Na, NH_3-N and TP and lower concentrations of Cl, NO_3-N and SO_4 than is currently typical of Moose Creek.

Changes in surface water quality medians for the data from May 23, 2019 to Dec. 9, 2020 at SW1 relative to upstream Moose Creek quality (SWMC2) that indicate the effect of the input of Fraser Drain and the treated effluent discharged to Fraser Drain can be summarized as follows:

- Boron – median increases from 0.050 to 0.680 mg/L;
- Chloride – median increases from 19 to 101 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.570 to 0.670 mg/L;
- Sodium – median increases from 13 to 110 mg/L;
- Ammonia – median increases slightly from 0.120 to 0.170 mg/L;
- Nitrate – median increases from 2.64 to 29.80 mg/L;
- Phosphorus Total – median increases from 0.056 to 0.090 mg/L; and,
- Sulphate – median increases from 43 to 111 mg/L.

The Upper-Tayside drain is on the western edge of the proposed landfill expansion. It has a large catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17, 2020. Based on the mean concentrations, SWLTD1 concentrations for 2020 of Na, NH_3-N, NO_3-N and TP were double those of SWFD3 for both 2019 and 2020 and B was higher. Other variables were similar to or lower than SWFD3 concentrations. Median concentrations of Fe and TP exceeded the PWQO and median NO_3-N exceeded the CWQG.

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1. Introduction

1.1 Background

CanDetec Inc. (CanDetec) was contracted by GFL Environmental Inc. (GFL) initially in 2018 to assist with the surface water monitoring program for the existing landfill operation and to develop a monitoring program for characterizing baseline aquatic quality and quantity based on data from 2019 and 2020 for the future expansion of the Eastern Ontario Waste Handling Facility (EOWHF). The existing EOWHF which includes the landfill site, is located within the Township of North Stormont, approximately 5 km north-northwest of the village of Moose Creek, Ontario, and 5 km east of the village of Casselman, Ontario (Figure 1). The landfill, which is one of several services offered on the site, occupies approximately 112 hectares (ha) of the entire 189 ha licenced property (HDR, 2018).

The proposed 240 ha landfill "expansion site" is immediately to the east of the existing landfill and is bounded by Concession Road 7 to the north, Highway 138 to the east, Laflèche Road to the south, and the Fraser Drain to the west. An Environmental Assessment (EA) study is being completed in support of the proposed landfill expansion. Establishing the existing surface water quality conditions at the site is required as part of the EA study in order to investigate the potential impacts of the development on the affected surface drainage systems.

The existing EOWHF landfill was initially approved under the Ontario Environmental Assessment Act (EAA) in 1999 and is operated by GFL under the Ministry of Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) A420018. The development of the EOWHF landfill was proposed to occur in two phases through four stages. The total capacity of the landfill was designed to be 11.6 million m³ when fully developed. Phase 1 was approved in 1999, including Stages 1 to 3A, with a total capacity of 7.4 million m³. Phase 2 was approved in 2019, including Stages 3B and 4, providing 4.2 million m³ of landfill disposal capacity. Landfilling commenced within Stage 3B in the latter part of 2019. Based upon the historical and forecasted filling rate at the existing landfill, GFL estimates that the landfill will reach its approved capacity by late 2025. The purpose of this EA is to provide additional landfill disposal capacity once the existing approved capacity is reached.

The proposed undertaking will occur on land currently owned by GFL to the east of the EOWHF, including an area in the northeast corner of the existing EOWHF. The existing EOWHF is located on the western half of Lot 16 and Lots 17 and 18, Concession 10, Township of North Stormont, United Counties of Stormont, Dundas and Glengarry, near the intersection of Highway 417 and Highway 138. The municipal street address for the facility is 17125 Lafleche Road, Moose Creek, Ontario. The lands to the east of the existing EOWHF being considered for future development include the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10.

Water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow

information for the water courses with dedicated baseline condition assessment commencing in May 2019.[1] The initial review of the data assembled prior to May 23, 2019 demonstrated that:

i. Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near EOWHF;

ii. Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any sampling overlap for stations in Fraser Drain and Moose Creek affected by periodic treated effluent discharge events;

iii. Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018; and.

iv. Since May 23, 2019, in part in response to the need for baseline condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters, water quality and quantity monitoring in the receiving waters was enhanced in 2019 and continuing through 2020.

The purpose of this report is therefore to characterize existing conditions of the surface waters with respect to quality in the vicinity of the existing landfill and the expansion site. Existing conditions for all watercourses upstream of the effluent discharge location to Fraser Drain will be considered as existing background conditions including Moose Creek (upstream of the confluence with Fraser Drain), Fraser Drain upstream of the effluent discharge location including other drains and tributaries as well as the Upper-Tayside drain. Due to the change in sampling regime that occurred with the dedicated baseline condition monitoring on May 23, 2019 (quarterly monitoring versus monthly or more frequent monitoring after May 23, 2019), the two periods are treated discreetly as statistical water quality differences may be the result of increased sampling frequency rather than a true change in water quality.

The Fraser Drain downstream of the effluent discharge location, and Moose Creek below the confluence with Fraser Drain; however, will be considered in three periods to assess trends or changes as a result of the effluent discharge. These periods are pre-discharge (1996 to 2007), early discharge without an emphasis on treated effluent effects monitoring (2007 to May 8, 2019), and current discharge with an emphasis on treated effluent effects monitoring since May 23, 2019.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in impacts on water quality in these water courses and an altered hydrology which have significantly affected existing conditions *vis a vis* natural or historic conditions. Historic conditions will not be emphasized in this report.

[1] *The baseline condition assessment monitoring that commenced on May 23, 2019, is described in detail in Section 3 of this report.*

1.2 Study Area Delineation

The expansion project site or "expansion site" is located on Lots 13, 14, 15, and the eastern half of Lot 16, Concession 10, Township of North Stormont, in the United Counties of Stormont, Dundas and Glengarry. The land is currently owned by GFL and is leased and used mainly as a sod farm with a smaller area for crop production (HDR 2020). The proposed expansion site currently drains to the two municipal drains that are located within the proposed development (Figure 1):

- Fraser Municipal Drain: in addition to surface and subsurface drainage directly to Fraser Drain which runs along the western border of the site, the Fraser Drain also receives water from a perimeter drain along the north side of the fields via surface flow and field drains. Fraser Drain turns west at the 7th Line Road and eventually joins Moose Creek; and
- Upper-Tayside Municipal Drain: receives drainage from surface and subsurface flow and a roadside ditch along the south side of Laflèche Road. The Upper-Tayside drain crosses through the southeast corner of the site and then runs towards the northeast, ultimately discharging to the Scotch River.

The Roxborough-Plantagenet Boundary Drain flows along the north border of the site. However, based on site inspection, flows from the expansion site are captured along a perimeter channel directly south of the Roxborough-Plantagenet Boundary Drain. This perimeter drain joins the Fraser Drain upstream of its confluence with the Roxborough-Plantagenet Boundary Drain after which it flows westward along the 7th Line Road to Moose Creek.

An unnamed drain on the south side of Laflèche Road, which forms the south border of the site, also conveys flows through a series of culverts towards the Fraser Drain and Upper-Tayside Drain. However, this drain does not appear to have direct connections with the expansion site, rather it receives drainage from fields to the south which are used for sod farming.

Thus, the study area is located within the Moose Creek and Scotch River subwatersheds, both of which are part of the Lower South Nation River watershed. The Moose Creek and Scotch River watersheds are situated in both the United Counties of Stormont, Dundas and Glengarry, and the United Counties of Prescott and Russell.

The existing Eastern Ontario Waste Handling Facility (EOWHF) is located on the western half of Lot 16 and Lots 17 and 18, Concession 10, Township of North Stormont, United Counties of Stormont, Dundas and Glengarry, near the intersection of Highway 417 and Highway 138. The municipal street address for the EOWHF is 17125 Laflèche Road, Moose Creek, Ontario.

The EOWHF encompasses a site area of 189 ha which includes waste management related activities and services. The property limits are constrained by the following boundaries:

- To the North: Fraser Drain which outlets into Moose Creek;
- To the West: Private drain and municipal road allowance;
- To the East: Fraser Drain; and,
- To the South: Albert-Fahey Award Drain.

A minimum 50 m separation distance is maintained from the north, east and west property boundaries and 120 m from the south property boundary and the peatland and woodlot area to the south.

The majority of the EOWHF site is zoned Waste Disposal, supporting the operation of the landfill. The existing adjacent lands are predominantly agricultural. The land is primarily flat with a system of surface and sub-surface agricultural drains surrounding the existing EOWHF site. The setting within the Moose Creek and Fraser Drain watersheds is shown in Figure 2.

Land uses adjacent to the existing landfill site and the expansion site boundaries are as follows:

- To the North: the land is owned by others and currently used for agricultural purposes (cash crops); beyond that is Highway 417;
- Expansion Site to the East of Existing Site: the land is owned by GFL and is currently leased and used as a sod farm with both surface and subsurface drains;
- To the South of the Existing Site: the land is owned by GFL and is currently leased and used for peat extraction as well as containing a naturally forested area;
- To the South of the expansion site: the land is owned by GFL and is currently leased and used as a sod farm with both surface and subsurface drains: and
- To the West of the Existing Site: the land is owned by others and currently used for peat extraction and primarily for agricultural purposes (cash crops) extending to Moose Creek.

The study areas identified for the EA, which will also be the basis for this study, included the existing EOWHF site encompassing an area of 189 ha plus the 240 ha expansion site as well as potentially affected and contributing surface water areas.

1.3 Objective of this Project

The objective of this report is to summarize available baseline water quality and quantity data to support the EA for the expansion of the EOWHF to the "expansion site". In order to fulfill this objective, the report reviews the existing baseline water quality and quantity data for areas outside of the expansion site including reaches of Fraser Drain and Moose Creek that are downstream of the treated effluent discharge from the existing EOWHF. The report will consider both the historical data available for the study area that dates back to 1996, prior to construction of the EOWHF, and will also summarize the data since May 23, 2019 that has focused particularly on the available synoptic data directly in association with treated effluent discharge events and the eastern drainage from the proposed expansion site that is part of the Upper-Tayside Drain. Reference also will be made to the Surface Water Quantity Existing Conditions Report (HDR, 2020).

1.3.1 Leachate Treatment Facility

The Leachate Treatment Facility (LTF) for the current operation is located at the northwest end of the site and has been operational since 2007. The LTF is reviewed here briefly as it discharges into the Fraser Drain 60 m upstream of SW2 and ultimately to Moose Creek upstream of SW1. With

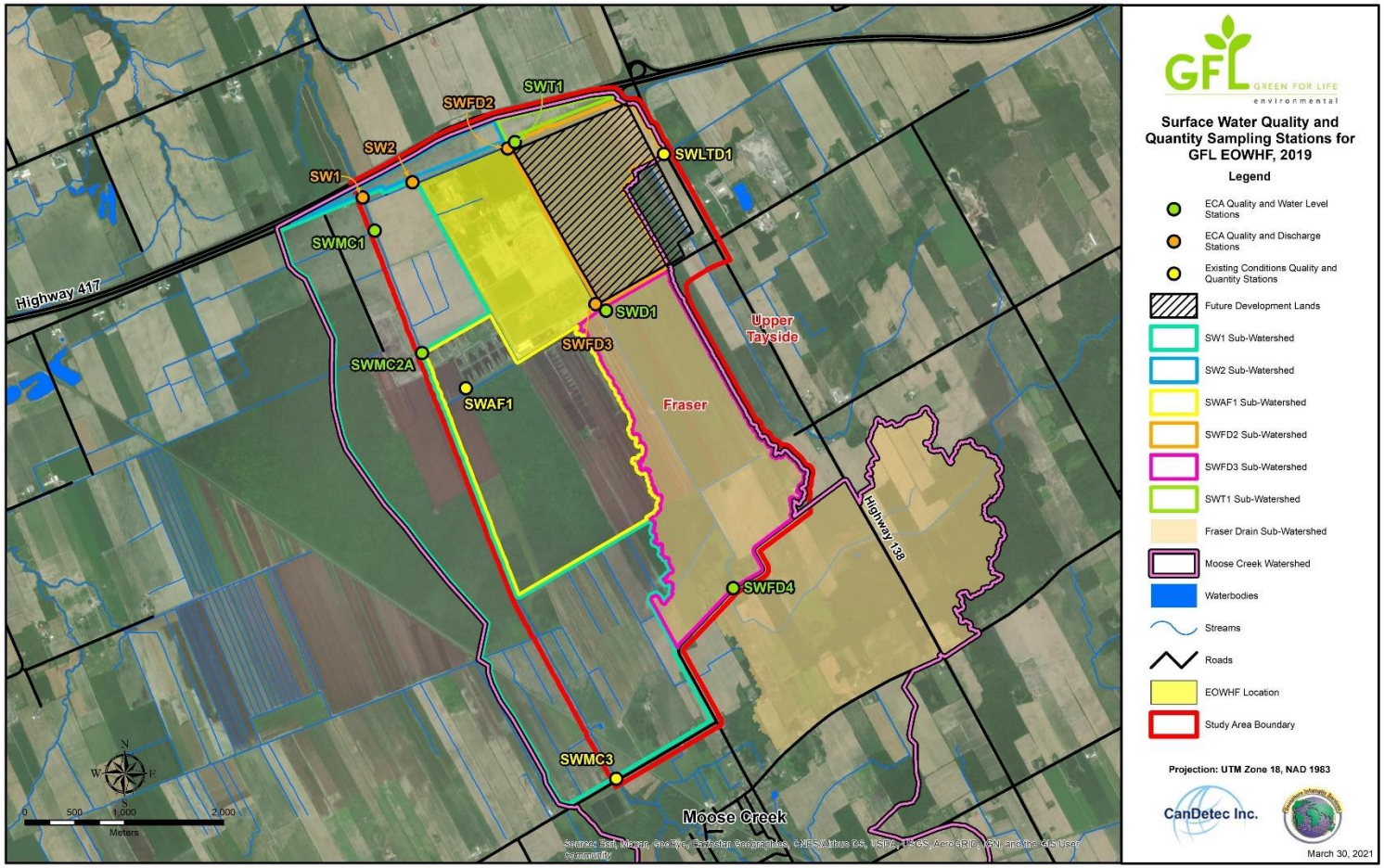
respect to certain key water quality variables that are present in the leachate and not mitigated in the LTF, there is a marked signature from the effluent in the receiving waters. As the landfill for the expansion site will utilize this LTF, potentially pending further upgrades, it is necessary to review the conditions in the stream reaches downstream of the LTF discharge, to understand existing conditions as affected by the treated effluent discharge in the affected portions of Fraser Drain and Moose Creek.

The existing LTF is operated under the Industrial Sewage Works Environmental Compliance Approval (ECA No. 2592-B83KSN, dated March 27, 2019). It has a rated capacity of 833 m^3/day and is approved to discharge up to 200,000 m^3 of treated effluent per year. Treatment consists of suspended media biological reactors, coagulation/flocculation tank, dissolved air flotation, and tertiary filtration. Prior to May 2019, treated effluent was discharged from the Effluent Holding Ponds (EHPs) to the Fraser Drain by batch discharge and a common pump rate of 50 L/sec over a pump time of approximately 30 hours providing a total discharge volume of the order of 5,000 to 6,000 m^3 per batch. Batch discharges occurred approximately every other week or 26 times per year. Since May 2019, effluent has been discharged on a batch basis but at variable discharge rates depending on the rate prescribed by MECP. During the dry season of 2019, a Draft Provincial Officers Order (POO) Number 0157-BGRN6S prescribed a discharge rate of 10 L/sec until 2019-10-31. In 2020, as directed by the MECP, an effluent discharge rate managed relative to the natural flow volume in Moose Creek was prescribed based on a 12 hour average Moose Creek flow such that a minimum dilution ratio of 5:1 (stream to effluent) was maintained during the low flow period from May 15 to October 31, 2020. No discharge was permitted if Moose Creek flows averaged less than 60 L/sec during this period and the maximum effluent discharge rate could not exceed 50 L/sec (MECP Memo, March 27, 2020).

1.3.2 Stormwater Management

The approved stormwater management (SWM) facilities are not being altered as part of the proposed change in the volume of treated leachate discharge and as a result, stormwater is not considered directly as part of the existing conditions report. Recently, stormwater from the EOWHF has not been discharged to the receiving water of Fraser Drain. As a result, there is not a direct effect of the stormwater on the quality or quantity of the receiving waters. However, the elimination of this volume of water from baseflow impacts on the hydrology of Fraser Drain which in turn can have an effect on water quality.

Figure 1 Location Map - Moose Creek, Fraser Drain and Upper Tayside Drain Watersheds and Sampling Locations



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2. Leachate Generation and Management

2.1 Leachate Management and Treatment

Treated effluent leachate only affects a small part of the receiving surface water system but it can have a dominant effect and must be reviewed to provide an understanding of the existing conditions for the sampling locations affected by the effluent (Stations SW1 and SW2). Consequently, the leachate and management system and monitoring requirements are summarized here.

Leachate is collected from sumps (leachate collection system {LCS}) and pumped to two aeration ponds located adjacent to the composting facilities at the south end of the facility. From the aeration ponds, leachate is pumped to the tertiary wastewater treatment facility (LTF). Treated effluent is pumped to two effluent storage ponds where it is sampled and confirmed to meet effluent discharge limits before discharge to the Fraser Drain.

The LTF, located at the northwest end of the site, has been operational since August 1, 2007. The LTF operates under Industrial Sewage Works Amended Environmental Compliance Approval (ECA) No. 2592-B83KSN, dated March 27, 2019. These works were significantly upgraded as of 2016 based on works approved as of March 16, 2015 (under ECA no. 4299-9U8PV6). The upgraded LTF included three suspended Media BioReactor (SMBR) units operating in series, a coagulation tank discharging to a dissolved air flotation system that discharges effluent to an existing effluent storage tank and discharging sludge to a sludge storage tank. Final effluent is discharged to the effluent holding ponds (EHPs). The ECA allows for the LTF to have an ultimate rated hydraulic capacity of 833 m^3 per day. The treated effluent is directed to two EHPs each with a functional storage capacity of approximately 6,600 m^3.

The EHPs have a common outlet structure supplied by two (2) 150 mm diameter high density polyethylene (HDPE) discharge pipes and one single discharge pump. The treated effluent is discharged to the Fraser Drain by batch when volumes require discharge and effluent quality is compliant with the ECA effluent limits (Table 1). From 2016 through to April 2019, batch discharge events occurred approximately every two weeks. Subsequently, batch discharges have been at variable rates as directed by the Ministry of Environment, Conservation and Parks (MECP) for 2019 (Appendices A through C). Discharge of treated effluent throughout 2020 was in accordance with direction in a memorandum from the MECP dated March 27, 2020 (see Appendices D and E). In summary, for 2020, effluent discharge during the dry season was in accordance with flow in Moose Creek measured continuously at SW1 with treated effluent occurring only when the 12-hour average flow in Moose Creek was in excess of 60 L/sec exclusive of the effluent discharge. Throughout 2020, effluent discharge ranged from 12 to 50 L/sec depending on the flow in Moose Creek with the objective of maintaining a 5:1 ratio of flow at SW1 (exclusive of the effluent volume) compared to the actual effluent discharge volume for the period of May through the end of October.

2.2 Effluent Limits

The approved effluent quality limits for the LTF are provided in Table 1. Under the ECA, the owner shall collect samples from the EHP to be discharged and analyse for the parameters outlined in Condition 6 (1) of the ECA (Table 1) prior to any direct effluent discharge from any EHP to Fraser

Drain. With the exception of $CBOD_5$ and effluent toxicity, the monitoring results must meet the requirements of the approved effluent quality limits prior to allowing the discharge of effluent from the EHP to Fraser Drain. If any of the parameters listed under Condition 6 (1) fail to comply with its respective effluent limit, further treatment and testing will be provided to the contents of the EHP prior to discharge. If monitoring results for $CBOD_5$ and or toxicity fail to meet the effluent limits[2], the Owner shall ensure that potential cause(s) of the non-compliance incident are identified and proper remedial actions are implemented to achieve compliance with the effluent limit. These actions are to be documented in a report submitted to the MECP District Manager.

Table 1 Effluent Limits for Discharge from Effluent Holding Ponds (ECA No. ECA No. 2592-B83KSN, dated March 27, 2019)

Effluent Parameter	Concentration Limit
$CBOD_5$ (mg/L)	10.0
Total Suspended Solids (mg/L)	10.0
Total Phosphorus (mg/L)	0.3
Total Ammonia Nitrogen (TAN) (mg/L)	1.0
Dissolved Oxygen (mg/L)	≥ 4.0
Iron (mg/L)	1.0
Copper (mg/L)	0.2
Zinc (mg/L)	0.2
Phenols (mg/L)	0.005
pH	≥ 6.0 to ≤ 8.5

Non-compliance with the effluent limits of the ECA is considered as follows:

i. Non-compliance with respect to a Concentration Limit is deemed to have occurred when any single sample analysed for a parameter, with the exception of Dissolved Oxygen, pH and CBOD5, is greater than the corresponding maximum concentration set out in Table 1;

ii. Non-compliance with respect to Dissolved Oxygen is deemed to have occurred when any single measurement is lower than the corresponding minimum concentration level of 4 mg/L;

iii. Non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range set out in Table 1;

iv. Non-compliance with respect to $CBOD_5$ is deemed to have occurred when a laboratory result obtained after each effluent batch discharge is greater than 10 mg/L; and,

v. Non-compliance with respect to toxicity occurs if there is a mortality of 50 % or more of any of the test organisms (Rainbow Trout or *Daphnia magna*) in the undiluted effluent;

[2] *These results are received after discharge commences but this exception is provided so as not to delay discharge based on the years of testing that demonstrate that $CBOD_5$ consistently meets the effluent quality limit and at no time in the past have the samples demonstrated toxicity to the test organisms.*

The rate of discharge to the Fraser Drain from the effluent ponds will be controlled such that erosion and/or flooding does not occur in the receiver downstream, up to a maximum flow rate of 50 litres per second.

2.3 Leachate Generation

For comparison purposes, the average total leachate treatment discharges from the existing landfill for each year from 2013 through 2020 are presented in Table 2 and range from 74,779 m^3 to 193,138 m^3 for 2015 and 2018, respectively, reflecting a gradual increase in leachate volume as the current landfill progresses. Although discharge during any one year is largely dependent on precipitation volume., the decrease in total discharge volume in 2019 is a result of the moratorium imposed by MECP on effluent discharge from June 27 to October 31, 2019, as discussed in Section 2.1. As a result, some treated effluent was stored in 2019.

Table 2 Estimated Historical Treated Leachate Discharge from Annual Reports (2013 – 2020)

Year	Total Estimated Discharge Volume (m^3/year)	Average Daily Treatment Rate (365 days) (m^3/day)
2013	83,313	228
2014	92,218	253
2015	74,779	205
2016*	132,282	361
2017	165,518	454
2018	193,138	529
2019	149,075	408
2020*	166,380	455

*Calculated for 366 days

2.4 Leachate Quality

Leachate quality since 2016 when the LTF was upgraded for key water quality variables is summarized in Table 3. Treated effluent quality details are contained in annual reports and in Appendix I. In general, quality of the effluent has improved over the course of the five years of

Table 3 Summary Water Quality Data for Treated Effluent (2016 – 2020)

Water Quality Variable	Effluent Limit as per ECA	PWQO or CCME / BCMOE Guideline	2020: Mean ± Standard Deviation (n = 17) [max]	2019: Mean ± Standard Deviation (n = 30) [max]	2018: Mean ± Standard Deviation (n=33) [max]	2017: Mean ± Standard Deviation (n=23) [max]	2016: Mean ± Standard Deviation (n=29) [max]
Boron (mg/L)		1.200	3.839 ± 0.778 [6.15]	4.755 ± 0.986 [6.410]	6.044 ± 0.510 [7.06]	5.998 ± 1.014 [7.300]	8.235 ± 0.825 [9.40]
Chloride		120	583 ± 133 [906]	767 ± 143 [931]	797 ± 135 [1000]	589 ± 134 [713]	860 ± 289 [1119]
Copper (mg/L)	0.2	<0.002	0.003 ± 0.002 [0.007]	0.004 ± 0.006 [0.036]	0.006 ± 0.003 [0.013]	0.010 ± 0.004 [0.018]	<0.01 ± N/A
Iron (mg/L)	1.0	0.30	0.066 ± 0.025 [0.127]	0.128 ± 0.006 [0.195]	0.105 ± 0.044 [0.19]	0.057 ± 0.031 [0.120]	<0.3 ± N/A
Sodium (mg/L)		180	614 ± 131 [888]	808 ± 157 [973]	870 ± 92 [1014]	816 ± 90 [994]	1214 ± 154 [1479]
NH_3 -N(mg/L)	1.0		0.221 ± 0.077 [0.460]	0.215 ± 0.136 [0.690]	0.328 ± 0.141 [0.780]	0.281 ± 0.387 [1.680]	0.635 ± 0.625 [2.53]
NO_3-N (mg/L)		3.0	251 ± 74 [413]	316 ± 62 [378]	234 ± 54 [332]	193 ± 43 [260]	362 ± 49 [394]
CBOD5 (mg/L)	10		3.0 ± NA [1 > DL]	<DL	<3 ± (N/A)	2.20 ± 1.17 [4.00]	2.10 ± 0.83 [4]
TSS* (mg/L)	10		3.6 ± 0.62 [5]	5.0 ± 3.6 [17]	6.6 ± 2.1 [10]	7.7 ± 5.0 [24]	6.9 ± 4.5 [17]
TP (mg/L)	0.3	0.03	0.074 ± 0.019 [0.100]	0.15 ± 0.165 [0.310]	0.108 ± 0.022 [0.17]	0.108 ± 0.030 [0.190]	0.158 ± 0.075 [0.37]
SO_4		429	236 ± 44 [319]	323 ± 171 [263]	712 ± 221 [1010]	558 ± 195 [936]	499 ± 169 [761]
Zinc (mg/L)	0.2	0.03	0.057 ± 0.020 [0.093]	0.089 ± 0.0004 [0.110]	0.100 ± 0.015 [0.124]	0.056 ± 0.019 [0.093]	0.133 ± 0.047 [0.200]
Phenols# (mg/L)	0.005	0.001	0.004 ± NA [1 sample >DL]	0.002 ± 0.018 [0.109]	0.014 ± 0.007 [0.026]	0.003 ± 0.001 [0.005]	0.002 ± 0.0015 [0.007]
DO (mg/L)**	≥ 4	4	12.4 ± 1.5 [10.4]	11.7 ± 2.5 [7.93]	11.4 ± 1.7 [8.14]	10.8 ± 2.6 [6.2]	10.5 ± 1.9 [7.16]
pH Range (pH units) (at all times)	6.0 - 8.5		7.8 ± 0.41 [8.41]	7.9 ± 0.40 [8.42]	7.8 ± 0.3 [8.4]	7.9 ± 0.2 [8.3]	7.9 ± 0.4 [8.8]

*TSS = Total Dissolved Solids, ** DO = field dissolved oxygen, [minimum] #Phenols at <0.002 mg/L taken as 0.002 mg/L

operation for B, Cl, Cu, Na, total suspended solids (TSS), TP, SO_4, and zinc (Zn) with essentially no real change for Fe, NH_3-N, NO_3-N, 5 day carbonaceous-biological oxygen demand ($CBOD_5$), phenols, dissolved oxygen (DO) and pH. None of these key water quality variables show a consistent increase over time in the effluent.

2.4.1 Potential Toxicity of Treated Effluent to Aquatic Life of Receiving Waters

2.4.1.1 Un-ionized Ammonia in Treated Effluent

Un-ionized ammonia in the treated effluent can be acutely toxic to aquatic organisms if the concentration in the receiving waters is in excess of 0.02 mg/L (MOEE, 1994a). Calculated un-ionized ammonia data from detailed chemical analysis for the treated effluent prior to discharge to the Fraser Drain, and upstream and downstream of the effluent discharge location (SW2 and SWFD3 respectively) are available in the annual reports for 2016 through 2020 (Tetra Tech, 2017, 2018, 2019 and 2020). These include calculated un-ionized ammonia concentrations except when field data or NH_3-N data were not available. These data, for discharge events where calculated effluent concentrations exceed the PWQO, are summarized in Table 4.

The treated effluent exceeded the PWQO in 2016 on two occasions - 2016-07-11 (0.0478 mg/L) and 2016-10-27 (0.0515 mg/L). On both of these dates the NH_3-N exceeded the treated effluent limit at 1.18 and 2.17 mg/L, respectively. The treated effluent limit for NH_3-N was also exceeded on 2016-03-15 (2.53 mg/L) but the un-ionized ammonia PWQO was not exceeded. The mean ± standard deviation for calculated effluent concentrations for un-ionized ammonia for 2016 were 0.0131 ± 0.012 mg/L on 29 samples.

In 2017, the treated effluent exceeded the PWQO for un-ionized ammonia on three dates as shown in Table 4. On each of these dates, the NH_3-N in the treated effluent was in compliance with the effluent limit. The treated effluent limit for NH_3-N was exceeded twice in 2017 (2017-04-06 and 2017-05-26 at 1.19 and 1.68 mg/L, respectively) but un-ionized ammonia did not exceed the PWQO on these dates. The un-ionized ammonia mean and standard deviation for 2017 were 0.010 ± 0.010 with 23 samples. Receiving water data were not available on the three dates shown in Table 4.

In 2018, seven samples of the treated effluent exceeded the PWQO for calculated un-ionized ammonia as shown in Table 4. The mean ± standard deviation [n] = 0.011 ± 0.013 mg/L [n = 33]. The concentration of un-ionized ammonia at SW2 exceed the PWQO on 2018-07-10 and 2018-08-15&16. These exceedances coincided with effluent discharge. SWFD3 was below the PWQO on these two dates.

In 2019, the calculated un-ionized ammonia in the effluent exceeded 0.020 mg/L on a total of eight occasions as per Table 4. Of these, the concentration at SW2 exceeded the PWQO only on August 27, 2019 and August 30, 2019 although the discharge event continued essentially continuously from August 21 to September 12. SWFD3 met the PWQO in 2019 when it was sampled.

The 2020 data for treated effluent had no exceedances of the PWQO with no exceedances of the ECA limit for NH_3-N. The mean and standard deviation [number of samples] for 2020 for un-ionized ammonia in the effluent was 0.0035 ± 0.0034 [n = 18].

Identification of treated effluent concentrations that exceed the PWQO was to discriminate discharge events that might impact the receiving water with respect to un-ionized ammonia as the effluent limits do not reference this analyte. However, it is the concentrations of un-ionized ammonia in the receiving water that are relevant to the PWQO, in this case SW2. Un-ionized ammonia

concentrations at SW2 that exceeded the PWQO are identified in red in Table 4. In 2019, none of the samples from SWFD3 exceeded the PWQO. During 2020, only one sample (2020-08-04) exceeded the PWQO at SW2 with an un-ionized ammonia concentration 0.046 mg/L, an effluent discharge rate of 50 L/sec and a total instream flow including the effluent of 360 L/sec. However, it must be noted that un-ionized ammonia concentrations upstream of the discharge location at SWFD2 and SWFD3 were 0.043 and 0.018 mg/L, respectively, on this same date. Treated effluent un-ionized ammonia concentrations, as noted above, did not exceed the PWQO throughout 2020, indicating that this was an upstream surface water problem not associated with the treated effluent discharge. From time to time, existing condition concentrations of un-ionized ammonia in the Fraser Drain may exceed the PWQO un-related to the effluent discharge from the EOWHF.

Table 4 Comparison of Un-ionized Ammonia Concentrations in Effluent, Downstream of Discharge at SW2 and Upstream at SWFD3 (Note: red numbers indicate concentrations exceed the PWQO; some receiving water sampling dates do not coincide with effluent quality sampling dates)

Date	Concentration of Effluent (mg/L)	Concentration at SW2 - downstream (mg/L)	Concentration at SWFD3 – upstream (mg/L)
2016-07-11	0.0478	0.0232	0.0154
2016-10-27*	0.0515	NA	NA
2017-06-22*	0.0352	NA	NA
2017-08-03*	0.0352	NA	NA
2017-09-14*	0.0251	NA	NA
2018-06-28&29	0.0301	NA	NA
2018-07-10	0.0583	0.0553	0.0052
2018-07-26&27	0.0251	NA	NA
2018-08-09*	0.0290	NA	NA
2018-08-15&16	0.0242	0.0333	0.0015
2018-08-27&28	0.0253	NA	NA
2018-09-12&13	0.0271	NA	NA
2019-05-6&7	0.0338	0.0015	<0.2
2019-05-23&24*	0.0212	NA	NA
2019-06-17&18	0.0349	0.0015	0.0006
2019-08-23	0.0439	0.0184	0.0005
2019-08-27	0.0255	0.0262	0.0075
2019-08-30	0.0320	0.0312	0.0008
2019-09-03	0.0301	0.0186	0.0004
2019-10-31	0.0209	0.0030	0.0003

* These sample dates, as far as can be determined, did not coincide with receiver sampling as related un-ionized ammonia concentrations in Fraser Drain are not reported (NA = not available).

The effluent limit is nevertheless based on total ammonia at 1 mg/L rather than un-ionized ammonia. During 2016 and 2017, total ammonia in the effluent exceeded the effluent limit on four occasions in 2016 (March 15, 2016 [2.63 mg/L], May 24, 2016 [1.30 mg/L], July 11, 2016 [1.18 mg/L] and October 27, 2016 [2.17 mg/L]). Only on July 11 and October 27 did the un-ionized ammonia in the effluent exceed the PWQO. On two occasions in 2017 (April 6, 2017 [1.19 mg/L] and May 26, 2017 [1.68 mg/L]), the effluent exceeded the limit for total ammonia but the PWQO was only exceeded on May 26 in the effluent. The effluent consistently met the effluent limit for total ammonia in 2018, 2019 and 2020. In general, exceedance of the effluent guideline for total ammonia is not a good indicator of the concentration of un-ionized ammonia either in the effluent or the receiving waters of Fraser Drain. As noted above, Fraser Drain exceeds the PWQO for un-ionized ammonia downstream of the effluent discharge apparently in response to discharge and both the quality of the effluent as well as conditions upstream of the effluent discharge.

3. Surface Water and Receiver Monitoring Background

3.1 Effluent and Surface Water Receiver Monitoring

3.1.1 Receiver Monitoring Prior to May 2019[3]

Samples were collected from the designated sampling locations (Figure 1) and at the frequency and sample type specified and analysed for the parameters listed in Table 2. Historically, amended ECA No. 2592-B83KSN set surface water receiver monitoring requirements for Stations SW2 (downstream of discharge) and SWFD3 (upstream of discharge). Sampling was required during every fourth discharge event based on periodic discharges when the effluent ponds were full and met discharge requirements. The consolidated ECA no. A420018 (Condition 54.0), Schedule "C" also required water quality samples to be collected during the prescribed periods of the year (spring, summer, fall and winter) at Stations SW1, SW2, SWFD3 and SWFD4. Noteworthy is the fact that these samples, historically, were not required to be collected at times of effluent discharge and as a result, represent seasonal existing conditions in the watercourses.

3.1.2 Sampling Station Naming Development

This monitoring program was modified in 2019 as outlined in Section 3.1.3. This realignment resulted in the discontinuation and addition of monitoring stations and necessitated a re-identification of the monitoring stations to avoid duplication and confusion. The surface water receiver monitoring station nomenclature effective as of May 2019 incorporates FD for Fraser Drain, MC for Moose Creek, AF for Albert-Fahey Award Drain and LT for Upper-Tayside Drain. Un-named drains are simply noted as Drains (D). The exception for this naming procedure were stations SW1 and SW2 which have not been re-named for continuity. The historic sampling location name and the corresponding new station names are provided in Table 5. This comparison is provided so that historic data references, which may include the pre-2019 identification can be linked to the current station abbreviated name. Photographs of some of these stations are provided below and are identified in Table 5.

[3] *Receiver sampling was enhanced in the spring of 2019 and again in 2020 as a result of directions from MECP or as a result of GFL expanding their monitoring program especially with respect to toxicity testing. These modifications are discussed below.*

Table 5 Surface Water Receiver Monitoring Station Naming Nomenclature for Pre- and Post-May 2019

Historic Site Name	2019 / 2020 Site Name	Photograph Identification	Site Description
SW1	SW1	Photograph 10	Moose Creek, downstream of bridge at Road 7 (note that the water quantity station is upstream of the bridge)
SW2	SW2	Photographs 4, 5 and 6	Fraser Drain, approximately 20 m east (downstream) of twin culverts and 60 m downstream of effluent discharge location
SW3	SWFD3	Photographs 2 and 3	Fraser Drain approximately 20 m north (downstream) of Laflèche Road
SW4	SWFD4	Photograph 1	Fraser Drain downstream of Norman Drive
SW2-3A	SWFD2	NA	Fraser Drain upstream of 90º bend at north east corner of landfill at Road 7 and downstream of field drain from the east
SWT1	SWT1	NA	Roadside ditch on south side of Road 7 entering Fraser Drain at northeast corner of landfill (requested by MECP)
NA*	SWMC1	Photograph 9	Moose Creek approximately 60 m upstream of confluence of Fraser Drain
NA	SWMC2A	Photograph 8	Moose Creek approximately 560 m downstream of confluence of Albert-Fahey Drain and Moose Creek and approximately 4700 m downstream of SWMC3
NA	SWMC3	Photograph 7	Moose Creek at No. 8 Road, downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1
NA	SWLTD1	NA	Upper-Tayside Drain at Highway 138 (only since 2020-03-17)
NA	SWAF1	NA	Albert – Fahey Award Drain approximately 200 m upstream of confluence with Moose Creek

*NA = not applicable

3.1.3 Effluent and Receiver Monitoring Since May 2019

As of May 2019, GFL proposed enhanced water quality and quantity sampling as a result of recommendations made in the first version of the Surface Water Impact Assessment Report (CanDetec, 2019). Shortly thereafter, further direction was received by correspondence from the MECP, dated June 27, 2019 which stated that:

> *"Treated effluent discharges during low flow conditions (May 15 to October 31) must be discontinued immediately, unless GFL provides analytical reports to demonstrate that treated effluent quality -including the parameters of*

concern identified in the memo- adheres to the aquatic protection values stipulated in the attached memo (CCME/PWQO/CWQG)."

This direction (Appendix A) precluded further discharges for the summer of 2019 until a draft Provincial Officers Order (POO) (Order No. 7622-BF3PGH) directed a discharge of treated effluent from the Site to Fraser Drain that would not exceed an effluent discharge rate of 20 L/sec extending for a three-week period (see Appendix B). This order required receiver water sampling as well as Acute Toxicity Testing on rainbow trout and *Daphnia Magna* on a weekly basis from the effluent outfall as well as SW1 locations.

A second draft POO was issued on October 11, 2019, directing GFL to commence discharging treated effluent as soon as possible and terminating discharge on October 31, 2019, at a rate not to exceed 10 L/sec (Appendix C). Among other requirements, sampling of the receiving waters was required as under Item no. 2 of this order and detailed in the "Response to GFL October 2019 Effluent Discharge Proposal" prepared by the MECP on October 4, 2019 (Appendix D). On November 1, 2019, GFL resumed effluent discharge operations as per conditions listed in ECA No. 2592-B83KSN. Compliance with these orders significantly affected the work undertaken in 2019 as sampling both for existing conditions in Moose Creek and Fraser Drain upstream of the discharge location ceased as well.

MECP comments, dated March 27, 2020, further altered discharge operations for the 2020 season (Appendix E). Specifically:

"In order to ensure some level of operational capacity for GFL through the low flow period of 2020 while ensuring some degree of protection of the aquatic environment, I recommend the following be implemented as an interim measure only:

- *Until such time that site-specific water quality criteria are developed and accepted by the Ministry, a minimum dilution ratio of 5:1 (stream flow to effluent) should be maintained during the low flow period (May 15 - Oct. 31). Effluent discharge shall continue to be to the Fraser Drain.*

- *No discharge of treated effluent should be permitted where streamflow in Moose Creek (without influence of effluent) is less than 60 L/sec.*

- *Streamflow should be calculated based on 12-hour running average water level in Moose Creek (measured by continuous level loggers). If continuous level loggers are not equipped with real-time data transmission, water level must be measured at least twice daily during discharge using a staff gauge (staff gauges must be co-located with level loggers, installed and surveyed in-to place by a QP).*

- *Given the 'preliminary' status of the rating curves for the receiving watercourses, calculation of streamflow must be carried out using the most accurate method available (as per the opinion of a QP).*

Instantaneous stream discharge measurement should continue at least twice monthly to support de-velopment of stage versus discharge rating curves.

Documentation to be maintained during discharge must include, but is not necessarily limited to:

- *Source of effluent, time of start and end of discharge, time of effluent sample collection, and rate of effluent discharge.*
- *Date and time of water quality sampling in receiving waters, name of per-son collecting samples and water level at the time of sampling either from staff gauge or level logger.*
- *Calculated and/or measured streamflow at the time of sample collection and data used to calculate streamflow where applicable (i.e. water level at the time of sample collection, rating curve used to determine stream-flow).*

Receiving water monitoring should be undertaken as proposed by GFL (as mandated in the site's ECAs, with recommended supplemental sampling / parameters, and as proposed in the 3-year surface water assessment program).

For clarity, regular monitoring locations are SW3 (aka SWFD3), SW4 (aka SWFD4), SWMC1, SWMC2, SWT1 and SW2_3A (background), and SW2 (aka SWFD2), SW1 (downstream). I have also recommended an additional monitoring location be established downstream of SW1 to evaluate attenuation of effluent parameters with distance."

During discharge, samples must be collected from background stations SWFD3 and SWMC1, and from downstream stations SW2, SW1 and the newly established station downstream of SW1, hereafter referred to as SWMC5. Chronic toxicity samples (proposed by GFL) should be collected from SW1, SW2 and effluent during discharge at low flows. Toxicity sampling must correspond to water quality sampling. GFL must ensure that all samples collected 'during dis-charge' are collected in a manner that captures representative conditions in the receiver during that discharge event.

Accordingly, the sampling program for 2019 and 2020, that forms the basis for this existing conditions report, was expanded in consultation with MECP to comply with the requirements of these directions, to the extent possible. The monitoring requirements for the revised sampling regime are summarized in Table 6. Water quality, quantity and field measurement events for 2019 and 2020 are listed in Table 7. Sampling generally occured monthly (rather than quarterly as previously done) when treated effluent discharge was occurring and instream flow was present.

Table 6 Surface Water Receiver Monitoring Requirements

Locations	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD1, SWT1, SWMC1, SWMC2A, SWAF1, SWLTD1
Frequency	Monthly for general water chemistry, metals and phenols coinciding with the sampling of treated leachate from the Effluent Holding Ponds and quarterly for organics
Sample Type	Grab
Parameters	General (monthly): Alkalinity, CBOD5, Calcium, Chemical Oxygen Demand (COD), Chloride, Conductivity, Dissolved Organic Carbon (DOC), Dissolved Oxygen (DO), Magnesium, Nitrate Nitrogen, Nitrite Nitrogen, Potassium, pH, Sodium, Sulphate, Temperature, Total Ammonia Nitrogen, Total Dissolved Solids, Total Kjeldahl Nitrogen, Total Phosphorus, Dissolved Phosphorus (lab filtered), Total Suspended Solids
	Metals (monthly): Aluminum (filtered in field), Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Selenium, Silver, Zinc
	Organics (monthly): Phenols Organics (quarterly): Benzene, 1,4-Dichlorobenzene, Dichloromethane, Toluene, Vinyl Chloride
Field Parameters (all samples)	Dissolved Oxygen (DO), pH, Temperature, Specific Conductance (Note: calibration required to be demonstrated)

The field measurements, temperature, pH and dissolved oxygen at the receiver sites were determined in the field at the time of sampling of Total Ammonia Nitrogen (TAN). The concentration of un-ionized ammonia was to be calculated using the TAN concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized) (MOEE, 1994a).

The 2019 and 2020 sampling was conducted for water quality including field measurements for the dates and stations identified in Table 7. Samples were collected by staff of SLR Consulting (Canada) Ltd. (SLR) and/or staff of GFL. Also shown in Table 7 are the dates and stations where water quantity measurements were taken as well as field duplicate samples for quality control assessments. These are discussed below. Note that while the monitoring program required sampling at the sites identified, flow measurements and quality sampling was not always possible due to dry or stagnant conditions at a specific location.

Table 7 Water Quality and Quantity Sampling In the Study Area in 2019 and 2020

2019	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2019-3-11	SW2, SWFD3,		SW2, SWFD3	
2019-5-8	SW2, SWFD3,		SW2, SWFD3	
2019-5-23	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD2, SWFD4, SWD2, SWMC1, SWMC2, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW4
2019-6-6	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SWFD3
2019-6-19	SWFD3, SWFD2, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-7-10		SW1, SW2, SWAF1, SWFD3,	SW1, SW2, SWFD3, SWAF1	
2019-7-12	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC4
2019-8-8	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD3, SWFD2, SWD2, SWMC1, SWMC2A, SWND3, SWMC3, SWAF1,	
2019-8-23	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-8-27	SW1, SW2, SWFD3, SWMC1,		SW1, SW2, SWFD3, SWMC1,	
2019-8-30	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-3	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-4		SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	
2019-9-6	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-10	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-23	SWFD3, SWFD2, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWFD4, SWFD3, SWMC3,	SWFD3, SWFD2, SWFD4, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-10-10	SW1, SW2, SWFD3, SWFD4, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-10-15	SW1, SW2, SWFD3, SWMC1,		SW1, SW2, SWFD3,*	

2019	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2019-10-18	SW1, SW2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC1*, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC4
2019-10-22	SW1, SW2, SWFD3, SWMC1,		SWFD3*, SWMC1*	
2019-10-25	SW1, SW2, SWFD3, SWMC1,	SW1, SW2, SWFD3,	SWFD3*, SWMC1*,	
2019-10-29	SW1, SW2, SWFD3, SWMC1,		SWFD3*, SWMC1*	
2019-10-31	SW1, SW2, SWFD3, SWMC1,	SW1, SW2, SWFD3	SWFD3*, SWMC1*	
2019-11-6	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4 SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SWMC1
2019-12-11	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	SWMC3
2020	**Quality Stations**	**Quantity Stations**	**Field Measurements**	**Field Duplicate Station**
2020-01-10	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1,	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1,	SW1
2020-01-22	SW2		SW2	
2020-02-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1,	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3,	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1,	SW1
2020-03-16	SW2, SWFD3		SW2, SWFD3	
2020-03-17	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1
2020-04-07	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWD2, SWT1, SWAF1, SWMC3, SWAF1, SWLTD1	SWMC1
2020-05-02	SW2, SWFD3		SW2, SWFD3	

2020	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2020-05-08	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SWMC5[4]
2020-05-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2020-07-30	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWMC5
2020-08-04	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2019-08-26	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2020-10-13	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWFD4
2020-11-03	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWMC2A
2020-12-08	SW2, SWFD3		SW2, SWFD3	
2020-12-09	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1

[4] *SWMC5 is a new station required by MECP as of the summer of 2020. It is located downstream of SW1 and accordingly is outside of the study area for the existing conditions report. However, any QA/QC data collected at this location has been included in this report.*

3.2 Field Procedures and Quality Assurance/Quality Control (QA/QC)

3.2.1 Field Procedures – Water Quality

At each sampling location, grab samples were taken upstream by SLR or GFL field personnel by submerging a bottle (provided by the laboratory) and filling it by moving it through the water column. If the parameter bottle contained a preservative, a separate, clean and empty bottle was used to fill the preserved bottle(s). The surface water samples were collected, prepared, and preserved in the field as follows:

- One plastic bottle sample, unfiltered and unpreserved for analysis of general chemistry parameters including BOD5, TDS, TSS, conductivity, and pH; and for filtering in the laboratory for analysis of dissolved aluminum (clay free sample) and dissolved phosphorus;
- One amber glass bottle sample with H2SO4 preservative, unfiltered, for analysis of phenols;
- One amber glass bottle sample with H2SO4 preservative, unfiltered, for analysis of COD;
- One plastic bottle sample with H2SO4 preservative, unfiltered for analysis of the following nutrients: TKN, ammonia, and total phosphorus;
- One plastic bottle sample with HNO_3 preservative, unfiltered for analysis of metals (total); and
- One amber glass bottle sample with HCl preservative, unfiltered for analysis of mercury (total).

All collected surface water samples were placed in appropriate laboratory-supplied, clean sample bottles and labelled with the project name, date, and sample location identification. All surface water samples were placed in ice-filled insulated coolers to be maintained at 4ºC and were taken to Eurofins laboratory in Ottawa, Ontario under a Chain of Custody. All samples were submitted to the laboratory within the holding times for each parameter to be analyzed.

Field parameters, specifically, water temperature, pH, dissolved oxygen (DO), and conductivity, were collected at each location. Conductivity and pH were recorded using a Hanna Pen and temperature and DO were recording using a YSI DO meter provided by SLR Consulting and Maxim Environmental Inc., respectively. Both instruments were calibrated before each site visit.
Observations such as turbidity, evidence of groundwater indicators (surface sheen, vegetation), presence of ice, and presence or evidence of aquatic life and human/animal use were noted.

3.2.2 Field Procedures – Water Quantity

Streamflow measurements by SLR Consulting were made using standard velocity-area methods using a Hach Flo-Mate (FH-950) MF Pro and wading rod. The wetted width of the stream was measured, and the length was divided into an even number of intervals. Depth (metres) and velocity (metres/second) were recorded at each interval beginning at the left bank and moving towards the right bank. For the purposes of this investigation, “left bank” was the bank situated on the left while facing upstream. Any important information that may have impacted velocity outcome (obstructions, boulders, shallow water, etc.) was also recorded. Measurements were not attempted under no flow or stagnant water conditions.

A Solinst™ water level logger was installed in a well fixed to the bridge across Moose Creek at SW1 in May 2020. This logger recorded water levels every 15 minutes and transmitted levels to a custom-built on-line interface that plotted "continuous" flows and calculated 12-hour average flows. This information was accessible on-line and based on the 12-hour average flow, the decision to discharge treated effluent and the rate of discharge between 12 and 50 L/sec was determined. A Solinst barologger for atmospheric pressure compensation was also installed at SW1 for air pressure compensation. A rating curve was developed for estimating flow from stream water level.

Low flow V-notch weirs with Solinst water level loggers were installed in June 2020 at SW2, SWFD2, SWFD3 and SWAF1 in an attempt to effectively measure low flow conditions continuously. It was not possible to use conventional weirs due to the size of the drains being monitored and the range of flows (0 to 1,000 L/sec). Consequently, these weirs were custom built and sized according to the channel dimensions at the specific location. Unfortunately, the fine grained, organic rich bank materials became unstable as water levels rose behind the weir, allowing bypass around the ends of the weirs. The soft bed sediments also washed out under pressure allowing the weirs to leak even though stabilized with sandbags. In the end, the logged water levels could not be depended upon to represent the stage at the weir; and consequently, spot flow measurements at the time of water quality sampling became the default flow measurement on Fraser Drain and at SWAF1.

3.2.3 Field Procedures – Quality Assurance/Quality Control (QA/QC)

Two QA/QC procedures were used in 2019 and 2020 for samples collected by SLR. The first was to collect a duplicate for each sample event as identified in Table 5. A field duplicate sample is a sequential sample that is taken concurrently to the collection of a regular sample. These samples provide an estimate of the overall variability of the field technique and laboratory analysis. One duplicate sample was collected for QA/QC purposes during each monitoring event undertaken by SLR. The field duplicate location was selected randomly for each monitoring event. The field duplicate was filled at the same time as the regular sample and submitted as blind field duplicate to Eurofins Environment Testing.

The second quality control procedure was the use of internal sample checks using deuterated surrogates of 1,2-dichloroethane (d4) and toluene (d8) and reporting the recoveries of these standards as a percent of the surrogate mass. A third, non-deuterated surrogate of 4-bromofluorobenzene was also reported as a percent recovery of the internal surrogate. The sample surrogates were introduced to the samples at the laboratory.

The duplicates were only collected as part of the sampling undertaken by SLR and the internal surrogates were only used by Eurofins. Samples submitted to Caducean Environmental Laboratories did not include internal standards for the analysis or a field duplicate sample.

Field procedures were implemented to minimize the potential of cross contamination between sampling locations. Field handling of samples was minimized by transferring samples directly into containers, when possible. Where handling was required, disposable nitrile gloves were used at all times and changed between samples.

3.2.4 Quality Assurance/Quality Control Results

The recovery of internal surrogates is summarized in Table 8 for samples in 2019 and 2020. The surrogate recoveries illustrate generally high analytical quality with median values that can be calculated close to 100%. The lowest recovery was 96% (toluene-*d*8) and the highest was 107% (1,2-dichloroethane-d4). Although the sample size is not large, recoveries demonstrate that results are uniform and reproducible.

Table 8 Surrogate Recoveries as a Percent of the Spiked Surrogate in Surface Water Samples (Number of Samples {n}, mean and 1 standard deviation) by Sampling Station (2019 and 2020)*

Station	1,2-dichloroethane-d4	4-bromofluorobenzene	Toluene-d8
SW1	n = 7, 107 ± 16	n = 7, 104 ± 9	n = 7, 101 ± 4
SW2	n = 7, 99 ± 9	n = 7, 102 ± 11	n = 7, 100 ± 6
SWFD2	n = 5, 101 ± 8	n = 5, 102 ± 12	n = 5, 100 ± 5
SWFD3	n = 7, 98 ± 8	n = 7, 100 ± 9	n = 7, 100 ± 6
SWFD4	n = 7, 99 ± 8	n = 7, 101 ± 8	n = 7, 100 ± 5
SWD2	n = 1, 107	n = 1, 99	n = 1, 104
SWMC1	n = 7, 101 ± 7	n = 7, 102 ± 10	n = 7, 99 ± 6
SWMC2A	n = 4, 99 ± 9	n = 4, 103 ± 10	n = 4, 102 ± 9
SWMC3	n = 7, 98 ± 9	n = 7, 101 ± 9	n = 7, 100 ± 6
SWT1	n = 3, 99 ± 4	n = 3, 104 ± 10	n = 3, 101 ± 6
SWAF1	n = 7, 97 ± 13	n = 7, 104 ± 10	n = 7, 100 ± 6
SWLTD1	n = 3, 101 ± 10	n = 3, 101 ± 9	n = 3, 96 ± 6

*Mean and standard deviation only determined if more than 2 samples

The reproducibility among the 22 duplicate samples from 2019 and 2020 are presented in Appendix G. Five-day $CBOD_5$ and Al frequently showed variability greater than 40% between paired samples; but, there were limited relative percent deviations values (RPD) > 40% for most analytes and samples. The sample from SWMC1 on 2020-04-07 was the only sample with multiple analytes with RPD values >40% (Cobalt [Co], Chemical oxygen demand [COD], chromium, [Cr], Copper [Cu], iron [Fe], manganese [Mn], ammonia [NH_3 -N], total phosphorus [TP] and total suspended solids [TSS]). In summary, reproducibility among the replicate samples is very good.

3.2.5 Acute and Chronic Toxicity Testing Procedures

Acute toxicity requirements for the effluent prior to discharge are summarized in Table 9. More frequent sampling occurred during 2019 and 2020 for both acute and chronic toxicity. Samples were submitted to Aquatox Testing and Consulting Inc. within the required sample holding time frame for determination of 48-hour test results for determining acute lethality of the effluent for *Daphnia*

magna (Environment Canada, 2000a) and for rainbow trout (Environment Canada, 2000b). Impairment and mortality were determined at 24 and 48 hours following exposure. Tests for chronic toxicity were also completed by Aquatox Testing and Consulting Inc. Seven day tests were conducted using fathead minnow considering impairment and mortality (Environment Canada, 2012) while 10 day tests using *Ceriodaphnia dubia* considered survival and reproduction (Environment Canada, 2007).

Table 9 Requirements for Toxicity Testing of Effluent[5]

Location	Effluent Holding Pond To Be Discharged
Frequency	Prior to Every Fourth Planned Batch Discharge Event
Sample Type	Composite - three (3) equal volume grab samples collected from the water surface, 1/3 depth, 2/3 depth of the effluent holding pond.
Parameters	Acute Toxicity - Rainbow Trout and *Daphnia magna* Chronic Toxicity – Fathead Minnow and Cladoceran *Ceriodaphnia dubia*

[5] *Note that the toxicity sampling protocols were modified from the ECA as discussed in Section 3.1.3.*

4. Surface Water Existing Conditions Within the Study Area

4.1 Features of the Study Area that Affect Existing Conditions

The EOWHF and the expansion site (together, the Study Area) are located in a predominantly agricultural area with peat extraction activities to the south and west of the site (HDR 2017). The agricultural uses include cash cropping on lands immediately north and west of the site and sod farming to the east. The majority of the surrounding properties are drained by surface and subsurface agricultural drains or peat drains which discharge to the Fraser Drain and the Albert-Fahey Award Drain both discharging to Moose Creek. A small part of the sod farms to the east of the EOWHF drain to the Upper-Tayside Drain, which feeds into the Scotch River watershed (Figure 1). The drainage is described in detail in the Surface Water Existing Conditions Report – Part A: Water Quantity, (Sabourin and Associates, 2017a) and Surface Water Quantity Existing Conditions Report (HDR, 2020). The Fraser Drain continues north along the EOWHF site's eastern border where it is joined by the roadside ditch along Concession Road 7, the Roxborough-Plantagenet Boundary Drain. Upstream of this confluence, the Fraser Drain receives flow from an ephemeral interceptor ditch to the east that receives agricultural drainage through surface and subsurface drains. The Fraser Drain flows west along the EOWHF existing site's northern border and eventual confluence with Moose Creek, approximately 0.6 km northwest of the existing landfill site. Soils along this part of the water course are organic rich peat underlain by silty, fine grained sand, which are highly permeable and easily eroded.

The water courses of Fraser Drain have broad channels excavated into the peat with fine grained or muddy bottom sediments that have evidently deposited into the base of the excavated drains. These fine-grained soft sediments appear to be as much as 2 m deep in the base of the drains. The sod farms and agricultural lands making up much of the watershed of Fraser Drain downstream of SWFD4 contain field drains and lack any naturalized buffer. The banks range from vertical and or undercut banks consisting of peat with extensive root mats where tall grasses and scrub bushes have developed as the buffer vegetation. Along Concession Road 7, the banks are at a more stable slope with heavy grass and weed vegetation. Cattail and tall grasses choke the channel to the immediate north of the existing landfill site and in the Roxborough-Plantagenet Boundary Drain. The Fraser Drain and the Roxborough-Plantagenet Boundary Drain channel are over-sized for base flow conditions and lack a defined low flow channel within a vegetated flood plain due to the excavation of the drains. Consequently, the drains are subject to erosion and bank slumping during high flow conditions.

The existing landfill lies to the west and south of Fraser Drain. Under natural conditions (prior to the landfill but not prior to agricultural activities and municipal/agricultural drain construction) most (estimated 166 ha) of the existing site's surface runoff was collected by the Fraser Drain while a small portion (approximately 14 ha) of the site drained to the Albert-Fahey Award Drain (Sabourin and Associates 2017a). These both drain to Moose Creek. Prior to the landfill, most of the site was covered by a poorly drained, vegetated peat bog some of which was extracted from 1986 to recent times. Prior to peat extraction, the bog's drainage was augmented by the construction of several drainage channels throughout the site. As the landfill activities commenced, surface drainage from the active landfill was managed by the leachate collection system while for adjacent lands, surface water drained to stormwater management ponds which are not connected to Fraser Drain.

While a naturalized buffer exists between the landfill and the drain, the containment of precipitation and snowmelt within the boundary of the landfill and the absence of runoff from the stormwater ponds (at least during the period of this study) has largely excluded this area from the contributing watershed of Fraser Drain and the Albert-Fahey Award Drain. Consequently, since the construction of the existing landfill, an estimated 166 hectares of contributing watershed have been removed from the total drainage area of Fraser Drain estimated at a current residual of 1,109 ha (HDR, 2020). Based on these drainage area measurements, the contributing watershed upstream of the SW2 sampling location has been reduced by approximately 13% by the current landfill. For later reference, the residual contributing area of the Fraser Drain may be reduced by as much as another 200 ha with the planned expansion or an additional 18% for a total loss of about 29% of the contributing watershed prior to development of the existing landfill.

Moose Creek, with a drainage basin area of approximately 6,160 ha above the bridge at Concession Road 7 (upstream of the Highway 417) drains agricultural land, forest and wetlands including the large Moose Creek Bog for approximately 15 km to the south. The drainage basin is typified by agricultural and municipal drains and field drains throughout the watershed except where the land has not been cleared and throughout the Moose Creek Bog. In general, Moose Creek in the study area consists of the Moose Creek Lower Municipal Drain and the Upper Moose Creek Municipal Drain. This constructed, aligned drain, has steep banks consisting of peat soils and soft, muddy, bottom sediments for a distance of at least 3 km upstream of Concession Road 7. Like Fraser Drain, Moose Creek in the 3 km reach above Concession Road 7 lacks a natural low flow channel and a flood plain. Agricultural activities within this reach as well as further upstream, generally flank the creek with no or very limited buffer strips. Agricultural land is generally used for cash cropping of wide spaced row crops. The presence of a number of roughly constructed culverts across the watercourse for agricultural access in the reach upstream of Concession Road 7 provide some pools and riffles on Moose Creek. Shading is absent along the watercourse wherever agricultural activities are undertaken except immediately upstream of SW1.

The Albert-Fahey Award Drain runs along the southern extent of the EOWHF draining peat lands and forests to the south and peat extraction lands and agricultural land to the north and west of the EOWHF. The Albert-Fahey Award Drain is a constructed, aligned drain with steep banks consisting of peat soils and soft, muddy, bottom sediments that are up to 2 m deep in the vicinity of SWAF1 (Figure 1). It extends for a distance of approximately 1.2 km along the south side of the EOWHF to its confluence with Moose Creek, 2.3 km upstream of Concession Road 7.

Downstream of the Concession Road 7 Bridge and outside of the study area, Moose Creek flows in a northward direction in an incised, more natural channel, to its confluence with the South Nation River, approximately 9.7 km north of the site.

A municipal lagoon servicing the Village of Moose Creek is located approximately 4 km upstream of the EOWHF site. The lagoon discharges to the Moose Creek once per year in the spring. The Moose Creek Water Pollution Control Plant (WPCP) Environmental Compliance Approval restricts the discharge to between March 15th and April 30th although "… *there are instances where the WPCP operator has requested an extension into May due to prolonged ice cover (D. Crump, Ontario Clean Water Agency, personal communication, June 15, 2017 e-mail)* (Sabourin and Associates, 2018b).

Additional information on the existing EOWHF landfill site itself, as currently configured, is provided in the HDR report (2018).

4.2 Water Quantity

4.2.1 Modelled Surface Water Quantity Conditions

Sabourin and Associates (2017a) and HDR (2020) undertook extensive surface water quantity assessments for the EA for the expansion of the existing site and for the expansion site to the east, respectively, including runoff modeling, topographic and LiDAR surveying of stream cross sections and topography, air photos and land cover and soils type data. These reports updated information on the existing drainage and the hydraulic capacities of the site's drainage features. Sabourin and Associates (2017a) undertook hydraulic computations/simulations to produce rating curves for select cross sections; preparation of survey culvert data summary sheets; preparation of a two-dimensional hydraulic model (HEC-RAS) of the Fraser Drain and Moose Creek for use in the estimation of water levels for various return periods; and estimation of full bank capacities of local drainage features, summarized in terms of flow rate and return period.

HDR (2020) was retained by GFL to assess and document existing surface water quantity conditions for lands in the vicinity of the future development lands. Using the most recent available topographic data, a digital elevation model (DEM) was created to form a basis for the hydrologic and hydraulic modelling using the stormwater management model (PC-SWMM). The DEM was used to delineate the sub-watersheds for each outfall location. HDR (2020) obtained soil and land use information for the Moose Creek and Scotch River watersheds from the Land Information Ontario (LIO) database and from local geotechnical investigations to characterize existing hydrologic input parameters.

Details on the results of this work are contained in each of the above referenced reports and are only briefly summarized here.

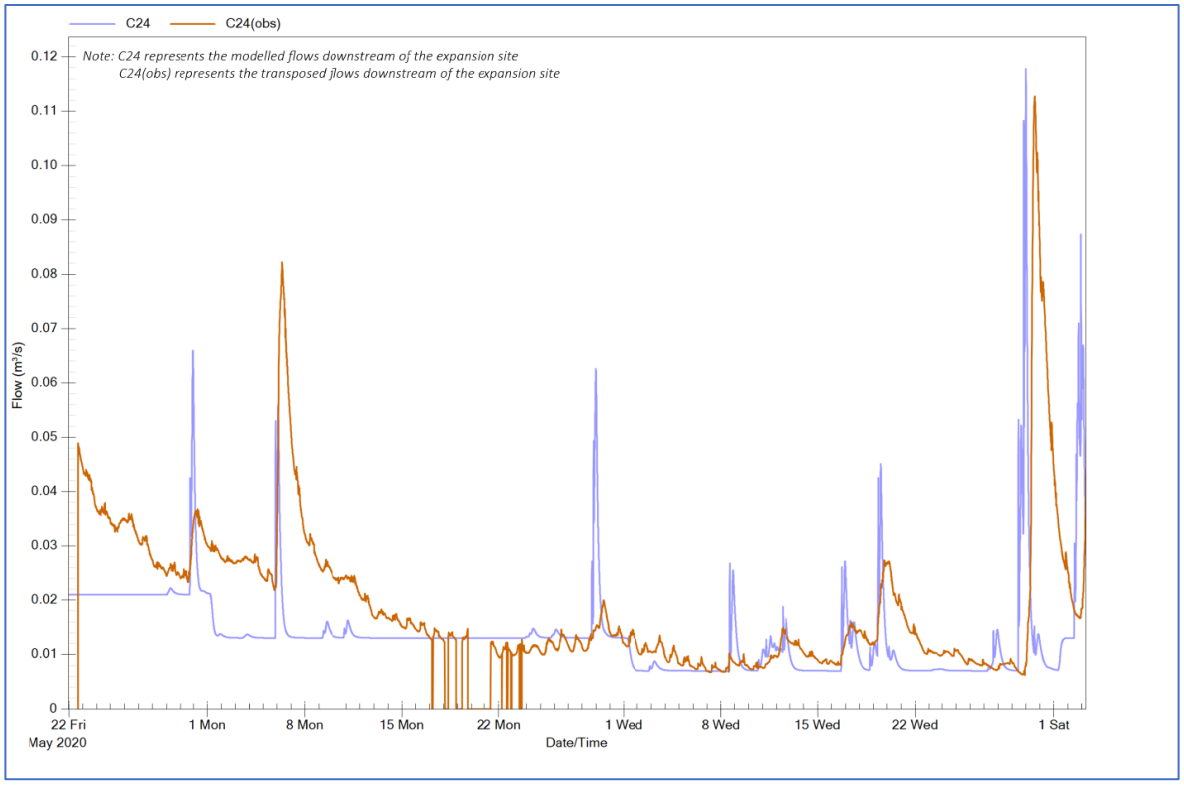
The Sabourin and Associates (2017a) report provides essential background information on the hydraulic capacity of the drainage systems in the vicinity of the landfill. The emphasis in this work was to assess the ability of the watercourse to manage extreme high flows efficiently thereby directly benefitting the agriculture activities. While the rating curves are useful for the various sites, the availability of flow data that is directly relevant to the water quality sampling is limited.

HDR (2020) used the calibrated model to establish existing peak flows for 2-year to 100-year events upstream and downstream of the existing EOWHF. HDR benefitted from the availability of spot flow measurements dating from May 2019 for SWFD4, SWFD3, from April 2020 for SWFD2, all on Fraser Drain and for SWLTD-1 (see Figure 1) since the summer of 2020 for the Upper-Tayside Drain. However, the intervals at which the spot flow measurements were collected did not provide sufficient point measurements to determine baseflows along the drains (HDR, 2020). Further, spot measurements could not be used for calibration and validation of the model.

HDR (2020) compared continuous flow monitoring data from SW1 for data available from May to October 2020. Flows were pro-rated from the Moose Creek logger, which has a contributing drainage area of 5,775 ha (according to the JFSA report or 6,160 ha according to CanDetec, 2019) to the data for the Fraser Drain directly downstream of the proposed EOWHF expansion site, which has a contributing drainage area of 1,109 ha. Using the rainfall data collected from the site, flows in the Fraser Drain were generated from the PC-SWMM model and compared to the transposed SW1 flows. The model was calibrated to match the magnitude of the modelled flows to the transposed measured flows. However, the timing of the peak flows generated by the model did not correspond to the peak flows of the transposed measured flows as illustrated in Figure 2 (HDR, 2020). Several

factors can be identified that help explain the absence of agreement. First, during the "wet" season (e.g., May, June and October) the declining limb of the hydrograph at SW1 has a much longer tail than predicted by the model. This is an artifact of the larger drainage basin area and the presence of the wetlands and naturally wooded areas in the Moose Creek watershed that attenuate the runoff. This lag effect is generally missing in Fraser Drain and the transposed data from SW1 would have to be controlled for this effect.

Figure 2 Comparison of PC-SWMM Modelled Flows and Transposed Flows from Moose Creek at SW1 to the Downstream Location on Fraser Drain (SWFD2) for the Proposed Landfill Expansion (source: HDR, 2020)



Secondly, Fraser Drain has been documented as an influent stream particularly in the reach between SWFD3 and SWFD2 especially under low flow conditions. This loss of flow appears to be a result of the shallow groundwater in the peaty soils dropping below the bed of the watercourse during the dry season resulting in stagnant pools and limited to no flow in this area and as far downstream as SW2. Consequently, rainfall events, which according to the model would generate flow within the ditch, fail to do so as they are filling available storage in the shallow groundwater. Filling the available storage in the groundwater is gradually overcome in the fall season again as illustrated in Figure 2. A better understanding of the hydrology of this area is required to fully understand the effects of the proposed landfill expansion.

4.2.2 Measured Stream Discharge

Prior to 2019, instream flow measurements were limited to approximately four flow measurements annually at SW1, SW2 and SWFD3 (Table 10). It appears that only water levels were measured at these locations in 2018 as corresponding flow measurements have not been located.

Commencing in May 2019, flow measurements were taken simultaneously with water quality sampling events at SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3 and SWMC3 and since March of 2020 at SWLTD1 when sufficient flow was present (Table 11). Exceptions occurred when flow was not evident or stagnant or the stream was frozen or ice or flow conditions made flow measurements unsafe for field staff.

Table 10 Measured Surface Flows in Moose Creek and Fraser Drain from 2013 to 2017 (values in parenthesis are estimates as per standard velocity area method as per Sabourin and Associates, 2017a)

Date	Estimated Flow for Moose Creek at SW1 (L/sec) (6,160 ha)	Estimated Flow for Fraser Drain at SW2 (L/sec)* (1,289 ha)	Estimated Flow for Fraser Drain at SWFD3 (L/sec)# (906 ha)
26/02/2013	256	52	25
23/05/2013	(6)[1]	(5)[1]	58
15/08/2013	(6)[1]	25	(4)
14/11/2013	(6)[1]	135	63
20/02/2014	111	11	3
15/05/2014	362	66	37
20/08/2014	82	12	11
19/11/2014	(6)[1]	9[1]	17
18/02/2015	(4)[1]	(4)[1]	16
13/05/2015	1079	285	116
26/08/2015	45	8	7
18/11/2015	522	88	61
10/02/2016	75	(4)[1]	19
11/05/2016	132	41	43
18/08/2016	(5)	(5)	(5)
23/11/2016	469	78[2]	15
18/02/2017	(4)	(4)	(4)
10/05/2017	1288	266	219

*Downstream of effluent discharge
#Upstream of Laflèche Road
[1] Estimated downstream discharge is questionable as significantly less than upstream flow
[2] This measurement believed to coincide with effluent discharge of 50 L/sec

Table 11 Spot Flow Measurement Data for Moose Creek, Fraser Drain and Upper-Tayside Drain from May 2019 to December 2020

Measure-ment Date	Treated Effluent Discharge Rate (L/sec)	SW1 Flow (L/sec)	SWMC3 Flow (L/sec)	SW2 Flow (L/sec)	SWFD3 Flow (L/sec)	SWFD4 Flow (L/sec)	SWAF1 Flow (L/sec)	SWT1 Flow (L/sec)	SWFD2 Flow (L/sec)	SWLTD1 (L/sec)
2019-5-23	50	609	253	153	69	38	71	2.3	NM	NM
2019-6-6	50	304	125	60	33	37	21	2.1	NM	NM
2019-6-10	0	21	NM	NM	NM	NM	NM	NM	NM	NM
2019-6-19	0	NM	141	NM	14	NM	32	NM	NM	NM
2019-7-10	0	21	NM	<1	7.4	NM	3.9	NM	NM	NM
2019-7-12	0	NM	731	86	47	39	4.3	NM	NM	NM
2019-8-8	0	52	10	<1	1.3	4.3	3.7	NM	NM	NM
2019-9-4	20	61	27	3.9	2.5	7.4	14	NM	NM	NM
2019-9-23	0	NM	14	NM	<1	3.9	3.1	NM	NM	NM
2019-10-10	0	29	21	3.0	12	6.7	5.1	Stag-nant	NM	NM
2019-10-18	10	590	184	98	41	31	18	NM	NM	NM
2019-10-25	10	226	NM	15	19	NM	NM	NM	NM	NM
2019-10-31	10	364	NM	77	43	NM	NM	NM	NM	NM
2019-11-6	50	985	513	206	100	54	44	17	NM	NM
2019-12-11	50	339	373	129	64	509	17	4.6	NM	NM
2020-01-10	50	44	104	55	frozen	11	12	frozen	NM	NM
2020-02-14	50	10	NM	1.5	2.4	0.9	NM	NM	NM	NM
2020-03-17	50	NM*	1212	393	246	242	99	190	NM	294
2020-04-07	50	1408	630	287	144	120	63	NM	200	62
2020-05-08	50	263	70	79	16	20	11	NM	28	28
2020-05-14	50	190	49	57	10	13	11	NM	21	6
2020-06-15	0	31	NM	NM	NM	NM	NM	NM	NM	NM
2020-07-30	26 – 30**	302	34	158	23	13	2.7#	NM	57	43
2020-08-04	50	513	99	361	92	65	8.3#	NM	110	99
2020-08-26	12	118	10	48	12	8.3	14	NM	34	9

Measure-ment Date	Treated Effluent Discharge Rate (L/sec)	SW1 Flow (L/sec)	SWMC3 Flow (L/sec)	SW2 Flow (L/sec)	SWFD3 Flow (L/sec)	SWFD4 Flow (L/sec)	SWAF1 Flow (L/sec)	SWT1 Flow (L/sec)	SWFD2 Flow (L/sec)	SWLTD1 (L/sec)
2020-10-13	12	94	46	26	25	51	14	NM	11#	16
2020-11-03	50	317	135	133	52	38	18	NM	40	25
2020-12-09	50	480	185	122	49	30	11	NM	53	32

NM – not measured
*not safe to measure
#measured over weir
**effluent discharge variable due to changing flow in Moose Creek

4.2.3 Continuous Water Level/Flow Measurements

Continuous water level measurements using V-notch weirs and water level loggers was recommended in 2019 to provide continuous water levels and flows, especially under low flow conditions which are critical to understanding low flow water quality. Installation of the weirs was delayed until mid-June 2020 due to the requirement to obtain a Letter of Advice (LOA) from the Department of Fisheries and Oceans Canada. The LOA, while allowing the weirs to be installed at three locations on Fraser Drain (SW2, SWFD2, SWFD3) and one location on Albert-Fahey Award Drain (SWAF1), stipulated that installation could not occur until after June 15, 2020.

The low flow V-notch weirs with Solinst water level loggers were ineffective. The fine grained, organic rich bank materials became unstable as water levels rose behind the weir, allowing water to by-pass around the ends of the weirs. The soft bed sediments also washed out under pressure allowing the weirs to leak even though stabilized with sandbags. In the end, the logged water levels could not be depended upon to represent the stage at the weir; and consequently, spot flow measurements at the time of water quality sampling became the default flow measurement on Fraser Drain and at SWAF1 (Table 11).

In May 2020, a continuous (every 15 minutes) water level recorder was installed at SW1 on Moose Creek. Based on these water levels and using the rating curve shown in Figure 3 from flow measurements from May 2019 through to June 15, 2020,[6] The estimated stream flow at SW1 and water temperatures based on data from the logger are presented in Figure 4.

[6] *Additional flow measurements have been made at SW1 on July 30, August 4 and 26, October 13, November 3 and December 9, 2020. These data have not been incorporated into the rating curve as this rating curve is being used to determine the timing and rate of treated effluent discharge. The rating curve will be updated at the end of 2020 for use during the low flow season of 2021.*

Figure 3 Rating Curve Used for Estimation of Stream Flow at SW1 from May 2019 to June, 2020

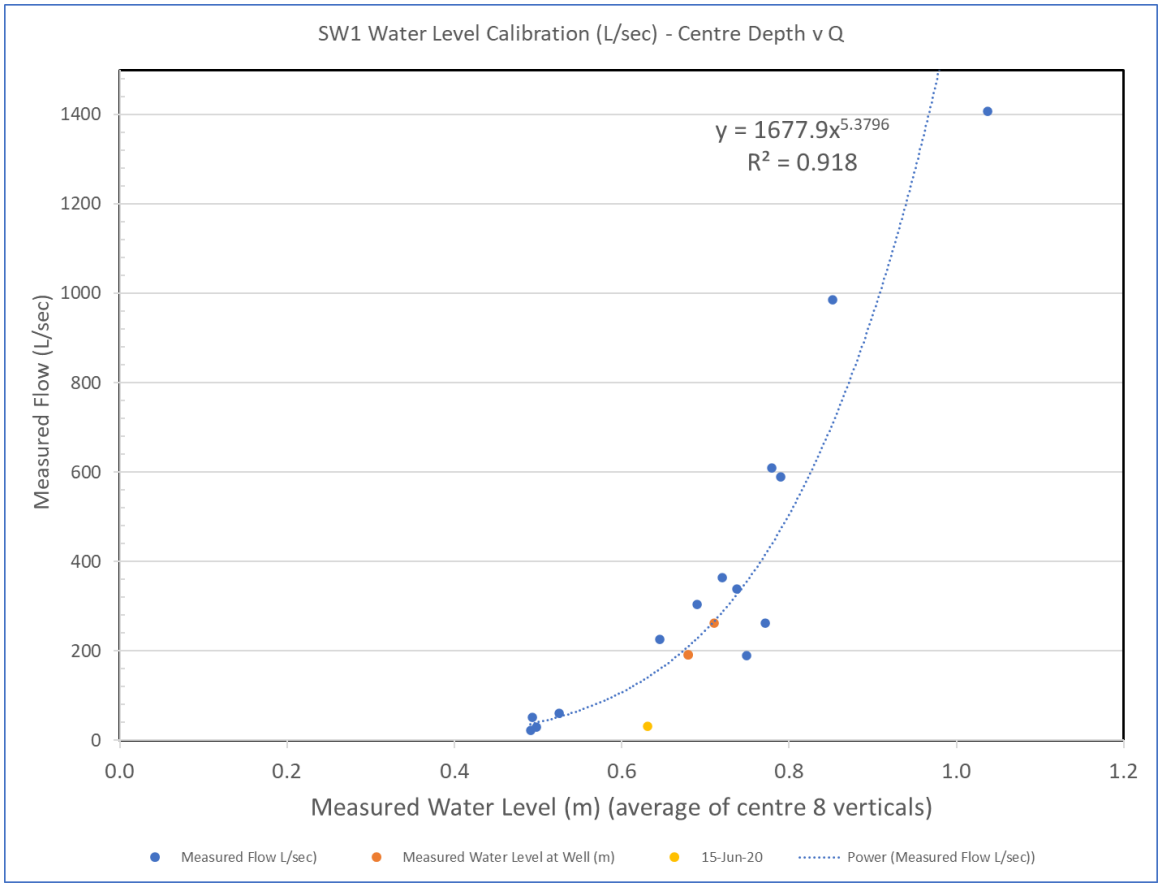
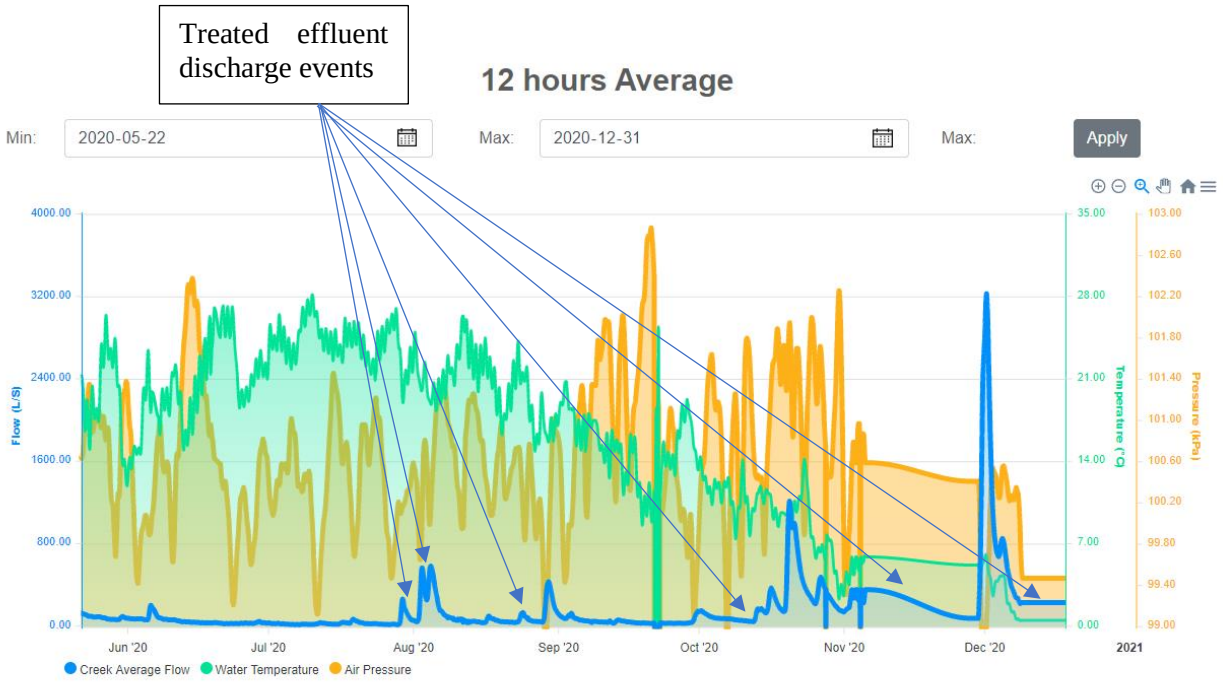


Figure 4 Estimated Flow and Measured Water Temperature in Moose Creek at SW1 between May 22 and December 31, 2020



4.3 Historic Quality of the Receiving Waters

4.3.1 Water Quality Sampling Station Selection

Water quality monitoring commenced within the watershed as early as 1996 and has continued in various forms to present. These data are reported annually in the annual reports provided to MECP by GFL Environmental Inc. (see for example Tetra Tech, 2018, 2019 and 2020). As outlined above, the surface water monitoring program was modified significantly in 2019 continuing through 2020.

For the purposes of the existing conditions assessment undertaken here, only long-term stations generally with year-round flow that represent conditions above and below the effluent discharge location are considered. Specifically, the following stations will be considered in detail (Figure 1):

- SWFD4 – Fraser Drain at Norman Drive – background conditions upstream of peat farms and sod farms and 3 km upstream or to the south of the southern property edge of the EOWHF and proposed expansion site, data period of record from July 12, 1996 to Dec. 9, 2020;
- SWFD3 – Fraser Drain at Laflèche Road – background conditions upstream of the landfill site and the proposed expansion site, approximate drainage area of 906 ha, data period of record from July 12, 1996 to Dec. 9, 2020;

- SWFD2 (formerly SW2-3A) - Fraser Drain upstream of 90º bend at northeast corner of the existing landfill at Road 7, downstream of field drain from the east along the proposed expansion site, upstream of the Roxborough-Plantagenet Boundary Drain, approximately 900 m upstream of the discharge location, background conditions, data period of record from Nov. 30, 2005 to Dec. 9, 2020;
- SW2 – Fraser Drain approximately one hundred metres downstream of effluent discharge, representative of near field mixing in Fraser Drain if flowing, approximate drainage area of 1,289 ha, data period of record July 12, 1996 to Dec. 9, 2020;
- SWMC1 – Moose Creek approximately 300 m upstream of the confluence with Fraser Drain – background for Moose Creek prior to any impact from leachate discharge from landfill, approximate drainage area of 6,000 ha, data period of record from Nov. 30, 2005 to Dec. 9, 2020;
- SWMC2 – Moose Creek approximately 1.6 km upstream of confluence with Fraser Drain and 550 m downstream of confluence of Albert-Fahey Award Drain – background for Moose Creek prior to any impact from leachate discharge from landfill, approximate drainage area of 6,000 ha, data period of record from Aug. 10, 2006 to Dec. 9, 2020;
- SW1 – Moose Creek at Concession 7 Bridge downstream of confluence with Fraser Drain and thus impacted by discharge from landfill, representative of a mixed station in Moose Creek, approximate drainage area of 6,160 ha, data period of record from July 12, 1996 to Dec. 9, 2020;
- SWAF1 – Albert-Fahey Award Drain approximately 200 m upstream of the confluence with Moose Creek, data period of record from May 23, 2019 to Dec. 9, 2020; and,
- SWLTD1 – Upper-Tayside Drain at highway 138, data period of record from March 17, 2020 to Dec. 9, 2020.

SWT1 is a roadside ditch referred to as the Roxborough-Plantagenet Boundary Drain runs along the south side of Concession Road 7 at the northeast corner of the existing landfill site. It enters Fraser Drain just downstream of SWFD2. This site (formerly SW2-3A) has been sampled, whenever flow permits, since Nov. 30, 2005 with the most recent sample being Dec. 9, 2020. Consistently, this site is dry or stagnant other than during spring freshet and with fall rainfall events. It receives field tile drainage water from a small area on the north side of Concession Road 7 but is isolated from the sod farm to the south, the expansion site, by a perimeter ditch 15 m south of the roadside ditch. The perimeter drain, which receives drainage from the field drains of the sod farm, enters the Fraser Drain upstream of SWFD2. While quality data for SWT1 cover 15 years, it is representative only of spring and late fall conditions and will not be considered as part of the characterization of existing conditions as the conditions of the area of the expansion site are better represented by SWFD2 which receives the water from the field perimeter drain.

The small roadside ditch to the south of Laflèche Road, although frequently dry (SWD2) will be considered as it directly receives surface and subsurface flow from the farm fields to the south which are similar to the farm fields on the north side of Laflèche Road.

In order to focus this report, the key water quality variables of greatest relevance to impacts from the treated landfill leachate will be discussed as well as other selected water quality variables. These have been selected either due to the ECA and the concern of the treated effluent discharge causing high concentrations in the receiving waters or due to naturally high background concentrations of

certain water quality variables in the receiving waters. The specific water quality variables discussed in detail in this report and their accepted PWQO or other water quality guideline are listed in Table 12. The analytes that are in "red" will be discussed at length as other water quality variables are in compliance with the appropriate objective or guideline or do not have an objective.

Table 12 Water Quality Analytes Considered in this Assessment. Key Variables and Objectives or Guidelines in "Red"

Analyte	Provincial Water Quality Objective (PWQO)	Method Reporting Limit	Effluent Limit	PWQO (APV for Na)	CCME* Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC** Surface Water Quality Guideline - Short/Long Term (mg/L)
Al (dissolved) (mg/L)	0.075*	0.01				
As (mg/L)	0.1	0.001				
B (mg/L)	0.2*	0.01			29/1.5	ND/1.2
Benzene (µg/L)					ND/370	ND/40
CBOD5 (mg/L)	1	10.0				
Cd (mg/L)	0.0002*	0.0001			.001/.00009	calculation
Cl (mg/L)		1			640/120	600/150
Co (mg/L)	0.0009	0.0002				0.110/0.004
COD (mg/L)	5					
Conductivity (µmhos/cm)	5					
Cr (mg/L)	0.0089**	0.001			ND/.001	
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002
DOC (mg/L)	0.5					
Fe (mg/L)	0.3	0.03	1.0		ND/0.3	0.001/ND
Hardness as CaCO3 (mg/L)	1					
Hg (mg/L)	0.0002	0.0001			ND/.000026	ND/calculation
Na (mg/L)		2		180		
NH_3 -N (mg/L)	0.02	1.0	1.0			
NH_3 -N (Un-ionized - calculated) (mg/L)	0.02					
NO_3-N (mg/L)		0.10			124/3.0	32.8/3.0
P - Total (mg/L)	0.03	0.01	0.3	0.03		

Analyte	Provincial Water Quality Objective (PWQO)	Method Reporting Limit	Effluent Limit	PWQO (APV for Na)	CCME* Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC** Surface Water Quality Guideline - Short/Long Term (mg/L)
Pb (mg/L)	0.025	0.001		0.025	ND/.007	0.003/ND
pH	6.5-8.5					
Phenols (mg/L)	0.001	0.001	0.005	0.001	ND/0.004	.050/ND
Se (mg/L)	0.1	0.001				
SO4 (mg/L)		1				**429**
TDS (COND - CALC) (mg/L)	5					
Toluene (µg/L)				0.8	ND/.002	ND/0.0005
Total Kjeldahl Nitrogen (mg/L)	0.10					
Total Suspended Solids (mg/L)	2	10.0				
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075

* CCME (Canadian Council of Ministers of the Environment) (various dates)
** BCMOE, (Ministry of Environment of British Columbia), 2018

4.3.2 Description of Historic and Existing Water Quality and Quantity in Fraser Drain

4.3.2.1 Background Water Quality

Three stations were selected for evaluation in Fraser Drain. SWFD4 is on Fraser Drain downstream of Norman Drive and approximately 3 km upstream and to the south of Laflèche Road and SWFD3, which is also upstream of the existing landfill. Neither station is directly affected by landfill activities and thus all available data (1996-07-12 to 2020-12-09) characterize background conditions for the Fraser Drain.

The historic station SW2-3A, now referred to as SWFD2, is on Fraser Drain at the northeast corner of the EOWHF and approximately 900 m upstream of the discharge point for the treated leachate. This location provides the primary indication of background water quality in Fraser Drain prior to the discharge of treated effluent. The slope of the drain between the treated effluent discharge and SWFD2 is low at between 0.10 to 0.18%. These calculations were based on detailed stream profiling and hydrologic modeling completed by J. F. Sabourin and Associates (JFSA) (JFSA, 2017). An estimated backwater effect from downstream of the effluent discharge location, based on an estimated flow of 200 L/sec at SW2, would result in a backwater effect of approximately 500 m or approximately half the distance to SWFD2 from the discharge location (CanDetec, 2019b). Consequently, even at the maximum discharge rate of the treated effluent of 50 L/sec, there will be

no backwater effect or impact on water quality measured at SWFD2 during treated effluent discharge events except perhaps under flows much greater than 200 L/sec.

As there is no direct impact of treated leachate discharge to Fraser Drain, data for each of SWFD2, SWFD3 and SWFD4 have been treated as a single data set prior to May 23, 2019 to characterize background water quality upstream of the effluent discharge location (Group A) (Table 13). Due to the fact that the sampling regime was altered significantly commencing May 23, 2019, the data since this date (Group B) have been summarized separately to account for the increase in sampling frequency over this 18 month period. The data for all stations for key variables are summarized and compared with Water Quality Objectives (PWQO) (MOEE, 1999), Canadian Council of Ministers of Environment (CCME) surface water quality guidelines and/or Environment British Columbia's Ministry of Environment's (BCMOE) surface water quality guidelines in Table 13 and for all variables in Appendix F.

The information from Table 13 indicates that upstream water quality degrades marginally downstream with median concentrations of TP and Fe frequently exceeding the PWQO. The 90th percentile statistics for both Group A and B for NO_3-N exceed the CCME long term guideline at all locations. Poorest water quality is generally associated with low flow conditions or periods of stagnation in the Fraser Drain.

Table 13 Summary Water Quality Statistics for Selected Variables for Fraser Drain Background Stations SWFD4, SWFD3 and SWFD2 for Key Water Quality Variables. Group A Includes All Data to 2019-05-08 and Group B Includes All Data from 2019-05-23 to 2020-12-09 (ND = no data)

Analyte (mg/L)	Effluent Limit	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWFD4 Group A Median / 90th Percentile (n)	SWFD3 Group A Median / 90th Percentile (n)	SWFD2 Group A Median / 90th Percentile (n)	SWFD4 Group B Median / 90th Percentile (n)	SWFD3 Group B Median / 90th Percentile (n)	SWFD2 Group B Median / 90th Percentile (n)
B		0.2	29 / 1.5	ND / 1.2	0.010/0.020 (40)	0.030/0.066 (73)	0.040/0.100 (43)	0.020/0.020 (22)	0.030/0.072 (34)	0.080/0.196 (15)
Cl			600 / 150	600 / 150	17.5/31.2 (68)	17.0/39.8 (93)	17.0/33.4 (43)	27.0/37.0 (21)	31.0/47.9 (34)	29.5/38.0 (16)
Cu	0.2		ND / 0.004	0.029 / ≤0.002	0.001/0.002 (36)	0.002/0.006 (75)	0.002/0.003 (39)	0.001/0.002 (22)	0.002/0.003 (34)	0.002/0.006 (14)
Fe	1.0	0.3	ND / 0.3	0.001 / ND	0.27/0.44 (67)	0.340/0.904 (93)	0.410/1.184 (43)	0.295/0.417 (22)	0.260/0.815 (34)	0.370/1.525 (16)
Na		180			11/18 (49)	12/26 (69)	14/38 (42)	13/24 (22)	17/30 (34)	19/32 (16)
NH_3-N	1.0				0.050/0.114 (59)	0.090/0.247 (82)	0.115/0.540 (40)	0.040/0.129 (15)	0.050/0.161 (27)	0.182/0.734 (13)
NO_3-N			124 / 3.0	32.8 / 3.0	0.89/3.38 (64)	0.960/4.433 (90)	1.080/3.904 (39)	2.25/4.29 (22)	1.98/4.98 (30)	2.35/6.42 (15)
Un-ionized ammonia		0.02			0.001/0.005 (27)	0.002/0.007 (78)	0.001/0.021 (40)	0.001/0.006 (11)	0.001/0.012 (17)	0.007/0.027 (10)
TP	0.3	0.03			0.034/0.077 (64)	0.050/0.223 (88)	0.110/0.294 (43)	0.029/0.085 (22)	0.060/0.159 (33)	0.249/0.855 (16)
SO_4				429	34/85 (69)	33/79 (93)	32/59 (43)	41/66 (22)	55/74 (33)	63/96 (16)

Median concentrations (Table 13) for SWFD4 Group B (2019-05-23 to 2020-12-09) have doubled for boron (0.010 for Group A to 0.020 mg/L for Group B), tripled for NO_3-N (0.885 to 2.245 mg/L for Group A and B, respectively) and increased by 10 mg/L for Cl (17.5 to 27.0 mg/L for Group A and B respectively) but have decreased slightly for NH_3-N and TP.

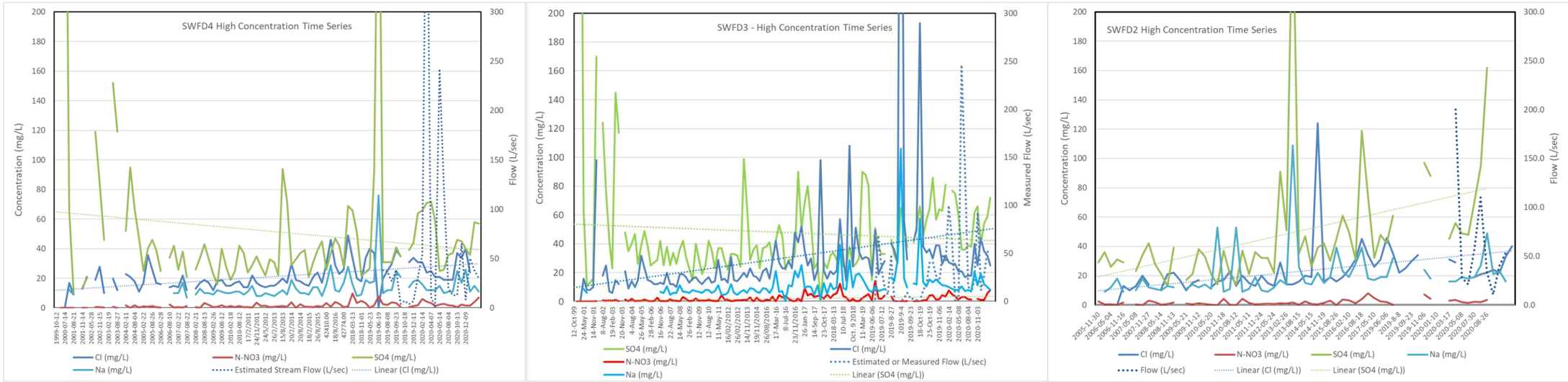
In general, median concentrations for SWFD3 Group B (2019-05-23 to 2020-12-09) have increased noticeably for Cl (17.0 to 31.0 mg/L for Group A and B respectively) and have increased for Na (12.0 to 17.0 mg/L for Group A and B respectively) NO_3-N (0.96 to 1.98 mg/L for Group A and B, respectively) P-Total (0.050 to 0.060 for Group A and B, respectively) and SO_4 (33.0 to 55.0 for Group A and B, respectively).

A comparison of selected water quality variables for Stations SWFD4. SWFD3 and SWFD2 for the period of record is provided in Figure 5. In-stream flows on the date of sampling are presented with these data, when available. In general, time trends[7] are not highly evident although increased concentrations are suggested for SO_4, Cl, Fe, Na and NH_3-N and TP at most of the sample locations. The high variability over time with these samples is likely associated with flow but there are insufficient data to assess the effects of low and high flows on water quality.

Time series plots for all data from SW2-3A/SWFD2 from 2005 through to December 2020 (Figure 5) suggests that concentrations are increasing in Fraser Drain with time upstream of the treated leachate effluent discharge location except for Cu which remains at very low concentrations. The up-ward trends are most noticeable for SO_4, Cl, Fe, B, Na, NH_3-N, NO_3-N and TP. The trend lines are illustrative only due to the vary low correlation coefficients determined for the lines. Median concentrations between the two time periods (Group A from 2005-11-30 to 2019-5-8 and Group B from 2019-5-23 to 2020-12-09) for SWFD2 indicate that B has increased from 0.040 to 0.090 mg/L, Cl from 17 to 29.5 mg/L, Na from 14 to 19 mg/L, NO_3-N from 1.080 to 2.350. P-Total from 0.110 to 0.249 and SO_4 from 32 to 63 mg/L. These upward trends in Fraser Drain cannot be attributed to impacts from the landfill operation but are indicative of general trends due to agricultural activities in the watershed or are related to the increased sampling frequency since May 23, 2019, resulting in better characterization of conditions year-round.

[7] *Linear time series lines are included for selected variables in the figure but the equation has not been determined or the significance of the line due to the high variability in the data. The time series lines are intended to be a general indication only.*

Figure 5 Time Series of Surface Water Quality for SWFD4, SWFD3 and SWFD2 for "High Concentration Time Series" (Cl, Na, NO_3-N and SO_4) and "Low Concentration Time Series" (Boron, Cu, Fe, NH_3 -N and P-total)



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4.3.2.2 Water Quality of Fraser Drain Downstream of Treated Effluent Discharge Location

Leachate Quality

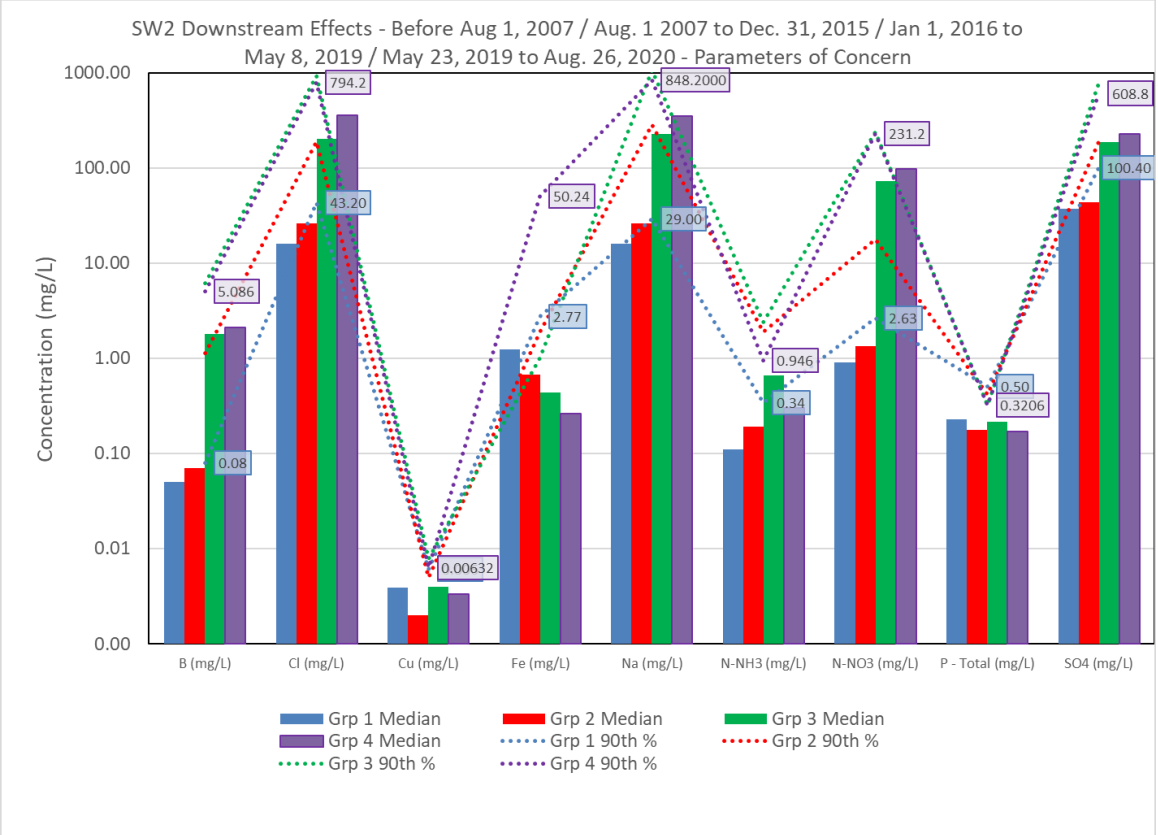
Detailed data for leachate quality of the EHPs to confirm quality and compliance with effluent limits (Table 1) are reported annually in the EOWHF Annual Monitoring Reports and are discussed in Section 2.4. In 2019 the effluent met the ECA compliance limits with limited exceptions including phenols (1), TP (1) and TSS (5). In 2020, the effluent was in compliance with all ECA limits at the time of discharge. However, a number of water quality variables in the treated effluent result in exceedances of various water quality objectives or guidelines used to characterize surface waters in Ontario. These variables include B, Cl, Na and NO_3-N. Other variables that have high background concentrations naturally in Moose Creek and Fraser Drain will be considered including Cu, Fe, TP, and phenols. These variables will provide the basis for the discussion with respect to existing water quality conditions.

Quality of Receiving Water at SW2 Downstream of Treated Effluent Discharge

SW2 is located proximally downstream of the effluent discharge with data covering July 12, 1996 to Dec. 9, 2020. Selected data (median and 90th percentile for key variables) are presented in Figure 6 for four time periods, namely before treated effluent discharge (pre 2007-08-01), early leachate treatment discharge (2007-08-01 to 2015-12-31), the period after the most recent upgrades to the LTF in 2015/2016 that ranges from January 2016 through to May 8, 2019 and finally, recent discharge linked sampling from May 23, 2019 to Dec. 9, 2020.

Figure 6 shows data for selected water quality parameters while all available data are summarized in Appendix F. However, it must be remembered that the surface water samples from SW2 have been taken generally independent of effluent batch discharges (this will be addressed further below) prior to May 23, 2019 and accordingly the samples prior to May 2019 do not necessarily demonstrate an effect of the treated leachate on the surface waters but indicate whether or not there has been any trend in water quality generally, or a residual impact of treated leachate pooling in Fraser Drain under low flow conditions. There are two sample dates at SW2 that may have coincided with effluent discharge (2016-11-23 and 2017-05-10); however, inspection of the data for these two sample dates did not show a clear effect that might be from the leachate. Consequently, these two samples were included with the other 10 samples within this time period (Group 3). As flow data were not collected at the time of water quality sampling prior to May 23, 2019, it is not possible to differentiate the water quality samples based on flow conditions, so data have been pooled based on the time periods noted above rather than flow in the creek.

Figure 6 Median and 90th Percentile for Key Water Quality Variables for SW2 for Four Time Periods (Group 1: Pre-August 1, 2007, Group 2: August 1, 2007 to Dec. 31, 2015, Group 3: January 1, 2016 to May 8, 2019 and Group 4: May 23, 2019 to December 9, 2020). Labels Show 90th Percentiles for Groups 2 and 4



There has been a minor increase in B concentrations at SW2 until Dec. 31, 2015, but both Groups 3 and 4 median values show an increase of one order of magnitude over the background periods. After May 23, 2019 water samples at SW2 have coincided with treated effluent discharge events with a median concentration of 2.1 mg/L. Median B concentrations for Group 3 data were 1.8 mg/L which is highly comparable to the Group 4 median suggesting an influence from the effluent discharge on B concentrations for samples from Group 3 (January 1, 2016 through to May 8, 2019). The 90th percentile concentrations for B show a steady rise across all four time periods, starting at 0.080 mg/L, rising two orders of magnitude in Group 2 to 1.12 mg/L, and rising again to 6.196 and 5.086 mg/L for Groups 3 and 4 respectively. Median B concentrations at SW2 currently exceed the long-term guideline of 1.2 mg/L (BCMOE, 2018).

Background median Cl concentrations have increased from a range 16 to 26 mg/L (i.e., prior to January 1, 2016) but jumped to 204 and 360 mg/L for Group 3 (2016-01-01 to 2019-05-08) and Group 4 (2019-05-23 to 2020-12-09), respectively. The 90th percentile concentrations have increased by an order of magnitude from 43 to 794 mg/L for Groups 1 and 4 respectively, indicating the effect of the effluent discharge on water quality at SW2. During discharge events, Cl concentrations commonly exceed the CCME long term guideline of 120 mg/L The median Cl concentration at SW2 for Groups 3 and 4 are also in excess of the CCME long term guideline of 120 mg/L, while the 90th percentiles for these two groups exceed the CCME short term guideline for Cl of 600 mg/L.

Sodium concentrations are also elevated at SW2 during discharge events. The historic mean concentration, prior to August 1, 2007 was 19 mg/L. However, these jumped to 1436, and 2754 for Groups 2 and 3, respectively, but has decreased by an order of magnitude to 427 mg/L for Group 4 when all samples coincided with discharge events. Nevertheless, the median concentrations of Na (354 mg/L) from May 23, 2019 through to the end of 2020 exceeded the MECP Aquatic Protection Value (APV) of 180 mg/L while the 90th percentile for this period was 848 mg/L.

NO_3-N also increased markedly since January 1, 2016 relative to historic concentrations at SW2. Historic mean concentrations for Groups 1 and 2 were 1.32 and 19.91 mg/L respectively; while they jumped to 98.44 and 122.86 mg/L for Groups 3 and 4, respectively. Median concentrations ranged from 0.90 to 1.34 to 72.70 and finally to 97.90 mg/L for each of Groups 1 through Group 4, respectively, indicating two orders of magnitude increase as a result of the discharge of the treated effluent. The median concentration over the past 20 months is an order of magnitude above the CCME surface water quality long term guideline of 3.0 mg/L. The 90th percentile for the Group 4 period from May 23, 2019 to Dec. 9, 2020 of 231.2 mg/L is about double the CCME short term guideline of 124 mg/L.

Sulphate (SO_4) mean concentrations have increased by an order of magnitude from historic conditions to those indicative of treated effluent discharge. Prior to the end of December 2015, historic mean concentrations were 52.4 and 85.4 mg/L for Groups 1 and 2, respectively. After January 2016, mean concentrations for Groups 3 and 4 were 299 mg/L and 279 mg/L, respectively. With the onset of effluent discharge and most noticeably since water quality measurements have been associated with discharge events, median concentrations for all four Groups were less than the EBC guideline of 429 mg/L; however, the 90th percentiles for Groups 3 and 4 at 773 and 609 mg/L both exceeded the EBC guideline of 429 mg/L (BCMOE, 2018).

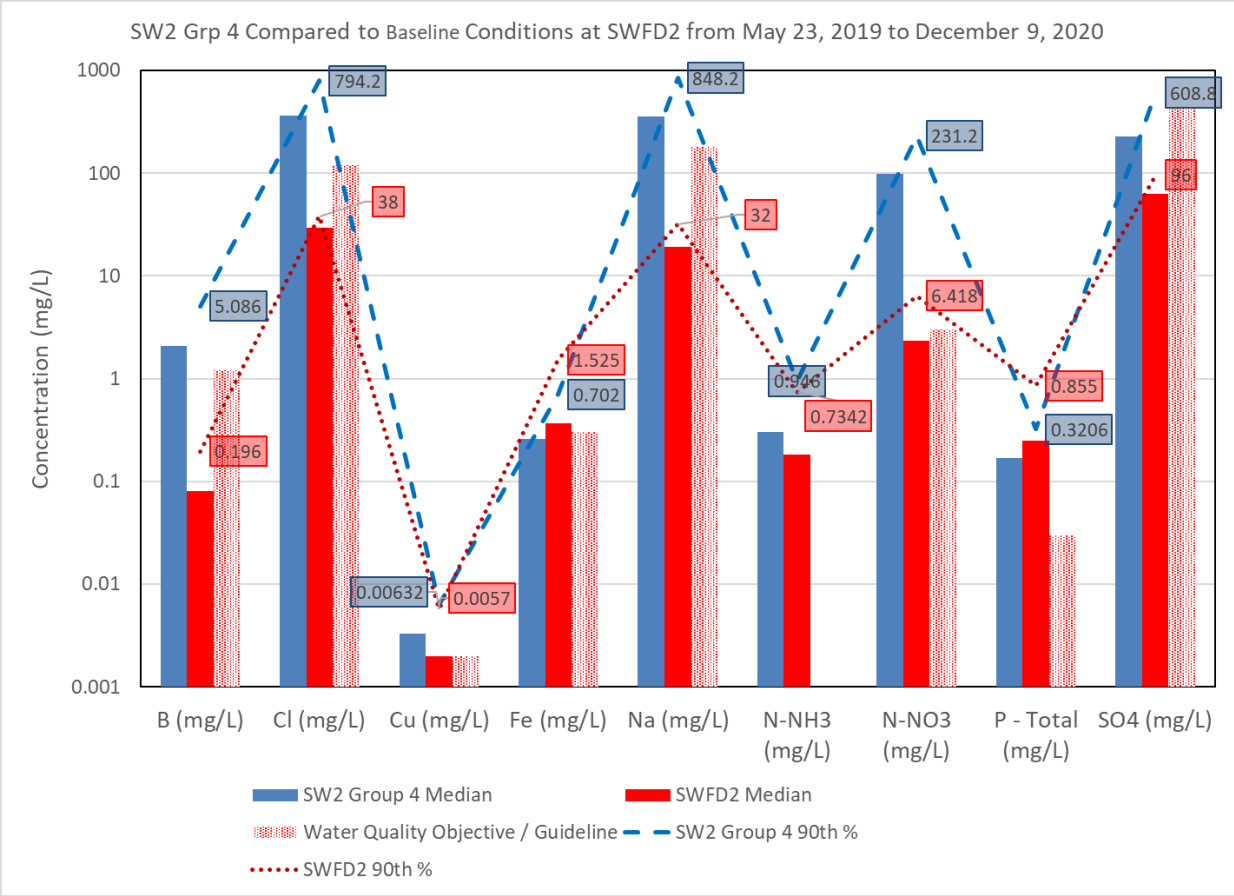
As seen in Figure 7, Cu, Fe, NH_3-N and TP do not show a significant impact from the leachate discharge or actually show an improvement in water quality for Fe at SW2. Cu concentrations are low in the effluent and the median of Group 4 is comparable to historic measurements. Ammonia has decreased in the surface waters since the Group 3 samples which peaked at 1.091 mg/L (mean, n = 30) due to reduced ammonia levels in the treated effluent in order to minimize un-ionized ammonia concentrations in the receiving water. Group 4 mean NH_3-N concentrations (0.433 mg/L) are comparable to historic concentrations (0.166 and 0.648 mg/L for Groups 1 and 2, respectively). The PWQO for un-ionized ammonia is 0.02 mg/L. Median and 90th percentiles for un-ionized ammonia were 0.0006/0.0065, 0.0015/0.0258, 0.0149/0.0770 and 0.0023/0.0182 for Groups 1 through 4, respectively. While un-ionized ammonia occasionally exceeded the objective during the period from August 1, 2007 through to May 8, 2019, there were no occasions from May 23, 2019 through to the end of December 2020 that the un-ionized ammonia objective was exceeded, comparable to historic conditions typified by Group 1 data.

TP in the receiving waters at SW2 have actually decreased over time as a result of the enhanced treatment of the effluent for phosphorus. Mean concentrations for each group of data have declined from 0.263, 0.220, 0.211 and 0.190 mg/L for Groups 1 through 4, respectively. Although the concentrations have decreased, they remain an order of magnitude in excess of the PWQO for TP of 0.03 mg/L.

Since May 23, 2019, samples have been collected at all locations on Fraser Drain during treated effluent discharge and flow measurements have been made, if possible to do so. Accordingly, data since May 23, 2019 have been compared to conditions at SWFD2 upstream of the treated effluent discharge location and above any influence of the stilling pond created by the weir at SW2 for this time period in Figure 7.

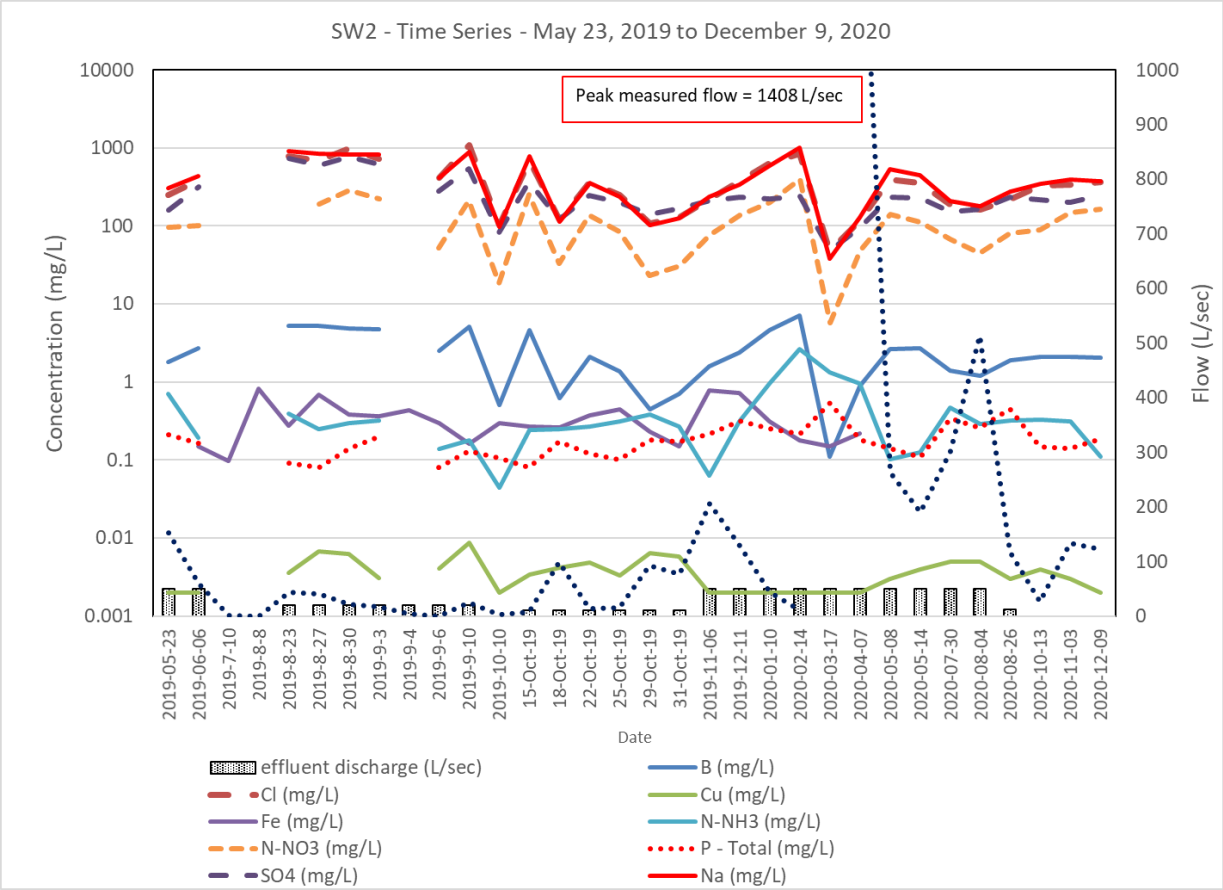
Consistent with the temporal observations noted above for SW2, the treated effluent discharged to Fraser Drain results in significantly increased concentrations for B (median concentrations of 0.08 versus 2.1 mg/L at SWFD2 and SW2, respectively), Cl (median concentration of 29.5 versus 360 mg/L at SWFD2 and SW2, respectively), Cu (slight increase of median concentration of 0.002 to 0.0033 mg/L at SWFD2 and SW2, respectively), Na (median concentration of 19 versus 354 mg/L at SWFD2 and SW2, respectively), NO_3-N (median concentrations increase from 2.35 to 97.9 mg/L for SWFD2 and SW2, respectively) and SO_4 (median concentration increase from 63 to 229 mg/L for SWFD2 and SW2, respectively). The quality of Fraser Drain water was not changed significantly or marginally improved for Fe (median concentrations decreased from 0.37 to 0.26 mg/L for SWFD2 and SW2, respectively), NH_3 -N (median concentrations increased marginally from 0.182 to 0.300 mg/L for SWFD2 and SW2, respectively) and TP (median concentrations decreased from 0.249 to 0.170 mg/L for SWFD2 and SW2, respectively).

Figure 7 Comparison of Median and 90th Percentile for Selected Water Quality Variables for Fraser Drain Stations SW2 and SWFD2 for Samples Collected since May 23, 2019 (Data labels are for the 90th percentile concentrations)



Water quality data for selected variables for each sample date in 2019 and 2020 are shown along with the measured treated effluent discharge rate and the measured stream flow for SW2 in Figure 8. Treated effluent discharge has been generally proportional to the flow in Moose Creek (SW1) during this period in order to provide a minimum 5:1 dilution of the effluent. Exceptions of this dilution ratio occurred during discharge events in accordance with an emergency discharge under a Provincial Officers Order (POO) (7622-BF3PGH) on the following dates: Aug. 23, 2019 (1.8:1); Aug. 27, 2019 (1.9:1); Aug. 30, 2019 (1.5:1); Sept. 3, 2019 (2:1); Sept. 4, 2019 (3:1); Sept. 6, 2019 (3:1); Sept. 10, 2019 (3:1); and under winter low flow conditions on Jan. 10, 2020 (1:1); Feb. 14, 2020 (1:1); and on May 14, 2020 (4:1). As a result, concentrations at SW2 are not highly variable among the 29 samples. In-stream concentrations peaked with high discharge rates and low instream flows and were minimized as in-stream flow rates were at a maximum such as on April 7, 2020 when flows at SW2 were measured at 1408 L/sec as well as on October 18 and October 29, 2019 with SW2 stream flows at 98 and 93 L/sec, respectively, and effluent discharge rates were 10 L/sec.

Figure 8 Time Series of Selected Water Quality Variables and Treated Effluent Discharge Rate and Measured Streamflow (L/sec) for SW2 from May 23, 2019 to August 26, 2020



Phenols in Treated Effluent and Receiving Waters

Phenols have not been included in the above discussion due to the fact that phenols commonly are less than laboratory detection or the method reporting limit (MRL) of 0.001 mg/L in the case of surface water samples or 0.002 mg/L for the treated leachate samples. The PWQO for phenols is 0.001 mg/L which requires the lower MRL. The effluent compliance limit for the treated leachate is 0.005 mg/L permitting the use of the slightly higher MRL. However, some receiving water samples have been analysed by Caduceon Environmental Laboratories using the higher MRL.

The LTF had some issues in late 2018 and early 2019 in meeting treated effluent compliance limits for phenols until this was addressed fully in April 2019. Phenol concentrations in the effluent in 2018 were compliant with the effluent limits for the period from January through to July 11, 2018 and again for November 7-8, 2018. Phenol concentrations in the treated effluent in 2018 were in excess of the effluent limit in discharge events between August 8 and December 20, 2018 (Table 14). Surface water samples corresponding to these discharge events are not available for 2018. The median concentration for phenols at SW2 from January 1, 2016 through to May 8, 2019 was 0.004 mg/L with 14 samples in excess of the

PWQO out of a total of 30 samples. The 16 samples that did not exceed the PWQO were at or less than the MRL.

Treated effluent concentrations of phenols in the holding ponds prior to discharge were 0.100, 0.003, 0.016 and 0.003 in January, February, March and April 2019, respectively. For the remainder of 2019, phenol concentrations were reported as equal to or less than the MRL of either 0.001 or 0.002 mg/L depending on the laboratory analysing the samples. The latter MRL reported by Caduceon Environmental Laboratories unfortunately exceeds the PWQO. Phenols in the effluent throughout 2020 have been less than the MRL except on March 16 and 17, 2020 when it was less than the effluent limit at 0.004 mg/L. The effluent quality and in-stream concentrations for 2020 are shown in Table 15.

Table 14 Phenol Concentrations in Treated Effluent in Holding Ponds and in Fraser Drain Receiving Waters at SW2

Event	Date of Discharge – 2018	Concentration in Treated Effluent (mg/L) (bold = > effluent limit or PWQO) / SW2	Event	Date of Discharge – 2018	Concentration in Treated Effluent (mg/L) (bold = > effluent limit or PWQO) / SW2
1	Jan. 2-3	<0.001	18	Jul 10-11	**0.037 / 0.014**
2	Jan. 17-18	<0.001 / <0.001	19	Jul. 16-17	**0.030**
3	Jan. 24-25	<0.001	20	Jul. 26-27	**1.016**
4	Feb. 1-2	0.002	21	Aug. 8-9	**0.010**
5	Feb. 12-13	<0.001	22	Aug. 15-16	**0.015 / 0.0100**
6	Feb. 26-27	<0.001 / <0.001	23	Aug. 27-28	**0.022**
7	Mar. 7-8	<0.001	24	Sep. 12-13	**0.027**
8	Mar. 15-16	<0.001	25	Sep. 24-25	**0.025**
9	Mar. 28-29	<0.001	26	Oct. 9-10	**0.024 / 0.029**
10	Apr. 9-10	<0.001 / <0.001	27	Oct. 15-16	**0.035**
11	Apr. 17-18	<0.001	28	Oct. 25-26	**0.021**
12	Apr. 30 -May 1	<0.001	29	Nov. 7-8	**0.037**
13	May 8-9	<0.001	30	Nov. 19-20	**0.012 / 0.005**
14	May 23-24	<0.001	31	Nov. 29-30	**0.011**
15	Jun. 4-5	<0.001	32	Dec. 10-11	**0.036**
16	Jun. 13-14	<0.001	33	Dec. 19-20	NA
17	Jun. 28-29	<0.001			

NA = not available

Surface water quality samples have been taken in association with treated effluent discharge events in the receiving waters at SW2 downstream and SWFD2 and SWFD3 upstream of the discharge location since May 23, 2019. Phenol concentrations at SW2 were less than the MRL at all times in 2019 except on October 10, 2019 (0.002 mg/L) and Dec. 11, 2019 (0.005 mg/L). On each of these dates, phenols in the effluent were less than the MRL except for the discharge event on March 16 and 17, 2019 (0.004 mg/L). The reported concentration in the effluent on this date remained below the established limit. Phenol

concentrations at SWFD2 exceeded the PWQO in the July and August samples but was less than the MRL and the PWQO in the March, April and May, 2019 samples. Further upstream, SWFD3 met the PWQO on all sample dates except in July and August.

There is no obvious pattern presented in the 2020 phenol data other than that the effluent concentrations are consistently low or at the MRL. Phenol concentrations outside of the influence of effluent discharge frequently exceed the PWQO in Fraser Drain under low flow conditions. However, at other times PWQO compliance occurs at low flows, indicating that discharge is not the sole determinant of phenols exceeding the PWQO. Similarly, concentrations vary with flows at SW2 precluding any assessment of a pattern except that the effluent meets the required ECA limit. The median[8] concentration at SW2 for the period May 23, 2019 to Dec. 9, 2020 is 0.006 mg/L and the 90th percentile is 0.0123 mg/L based on 10 samples greater than the MRL of a total of 28 samples.

Within Moose Creek at SW1, phenol concentrations ranged from the MRL to 0.006 mg/L from May 23 2019 to Dec. 9, 2020. The median was 0.004 mg/L based on 11 samples that exceeded the MRL out of a total of 29 samples. PWQO exceedances occurred during 2020 commencing in January and continuing through to Dec. 9, 2020 except for samples on April 7, 2020 and Nov. 3, 2020. However, as noted in Table 15, the treated effluent was consistently in compliance with the limit at <0.002 mg/L. The median phenol concentration during the same period at SWMC1 was 0.004 mg/L with only 6 samples in excess of the MRL out of 17. The four exceedances of the PWQO occurred in 2020 on the same dates observed at SW1, indicating that background phenols concentrations are affecting exceedances of the PWQO at SW1, provided the treated effluent meets the effluent limits.

[8] *Note that throughout this report median and 90th percentiles have been calculated using only the values above detection limit. Often the actual MRL, one half of the MRL or a random number less than the MRL are used in statistics but this has not been the approach here. Use of any one of these techniques to calculate a statistic would result in the median value, for example, being equal to or less than the MRL and thus the PWQO.*

Table 15 Comparison of Treated Effluent Concentrations and Concentrations in Receiving Waters (SW1, SW2, SWFD2 and SWFD3) for 2019 and 2020 for Phenols*

Event #	Discharge Date	Concen-tration in Treated Effluent (mg/L)	Concentration at SW1 – downstream (mg/L) (Q)	Concentration at SW2 – downstream (mg/L) (Q)	Concentration at SWFD2 – upstream (mg/L) (Q)	Concentration at SWFD3 – upstream (mg/L) (Q)
22/19	2020-1-9 &10	<0.002	0.005	0.015 (55)	NS	0.002 (NA)
01/20	2020-01-21&22	<0.002	NS	NS	NS	NS
02/20	2020-02-3&4	<0.002	NS	0.012	NS	<0.001
03/20	2020-03-13&14	<0.002	0.003	0.007 (1.5)	NS	<0.001 (2.4)
04/20	2020-03-2&3	<0.002	NS	0.002	NS	<0.001
05/20	2020-03-16&17	0.004	0.003	0.004 (393)	<0.001	<0.001 (240)
06/20	2020-03-26&27	<0.002	NS	NS	NS	NS
07/20	2020-04-6&7	<0.002	<0.001 (1408)	0.002 (287)	<0.001	<0.001 (144)
08/20	2020-04-16&20	<0.002	NS	NS	NS	NS
09/20	2020-5-2&3	<0.002	NS	NS	NS	NS
10/20	2020-5-7&8	<0.002	0.005 (263)	0.004 (79)	<0.001 (28)	<0.001 (16)
11/20	2020-5-13&14	<0.002	0.005 (190)	<0.001 (57)	<0.001 (21)	<0.001 (10)
12/20	2020-7-30	<0.002	0.002 (302)	0.006 (158)	0.005	0.005 (23)
13/20	2020-08-04	<0.002	0.006 (513)	0.006 (361)	0.007 (110)	0.005 (92)
16/20	2020-8-26	<0.002	0.003 (118)	0.008 (46)	0.005 (34)	0.003 (12)
17/20	2020-10-13	<0.002	0.004 (94)	<0.001 (27)	0.006 (11)	0.006 (25)
21/20	2020-11-03	<0.002	<0.001 (317)	<0.001 (133)	<0.001 (40)	<0.001 (52)
22/20	2020-12-09	<0.002	0.002 (480)	<0.002 (122)	<0.001 (53)	<0.001 (49)

*Dates of effluent testing and effluent discharge and in-stream sampling do not always coincide. In-stream conditions taken to the closest date to effluent testing. Lags occur as effluent analytical results must be received and confirmed relative to effluent limits in advance of discharge.
NS = no sample, NA = not available, Q = measured stream discharge including effluent at SW1 and SW2 (L/sec)

Phenol concentrations in surface water are all very low. Understanding natural phenols in the water courses and the source connection is limited by the fact that most detections are close to the MRL and the MRL frequently exceeds the PWQO. Upstream or background concentrations of phenols greater than the PWQO are also frequently observed in both Fraser Drain and Moose Creek. A clearer understanding of phenols in the surface water of Fraser Drain would require further investigation to understand the linkage between the discharge of the treated effluent and the concentrations in the surface water.

4.3.3 Description of Historic and Existing Water Quality in Moose Creek Watershed

4.3.3.1 Background Water Quality

Three stations were selected for evaluation of existing or background conditions in Moose Creek including SWMC1 above the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1,500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek and SWMC3 downstream of the village of Moose Creek and approximately

6.3 km upstream of SW1. Selected water quality parameters for these three background stations (median and 90th percentile) are presented in Figure 9 for SWMC1 covering the period of record from Nov. 30, 2006 to Dec. 9, 2020. These data are presented in two time periods, Group A for data prior to May 8, 2019 and Group B for data since May 23, 2019. This grouping addresses the change in sampling intensity that commenced as of May 23, 2019. Data for other variables are included in Appendix F.

Figures 10 presents comparable data for Moose Creek background stations SWMC2 and SWMC3 respectively. There is little change in quality between SWMC3 and SWMC2 (Group B) for the comparable data from May 23, 2019 to Dec. 9, 2020. SWMC3 has only been sampled for the period May 23, 2019 to Dec. 9, 2020.

Figure 9 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC1 Comparing Group A samples (2006-11-30 to 2018-12-17) to Group B samples (2019-05-23 to 2020-12-09). (Median values shown in data labels)

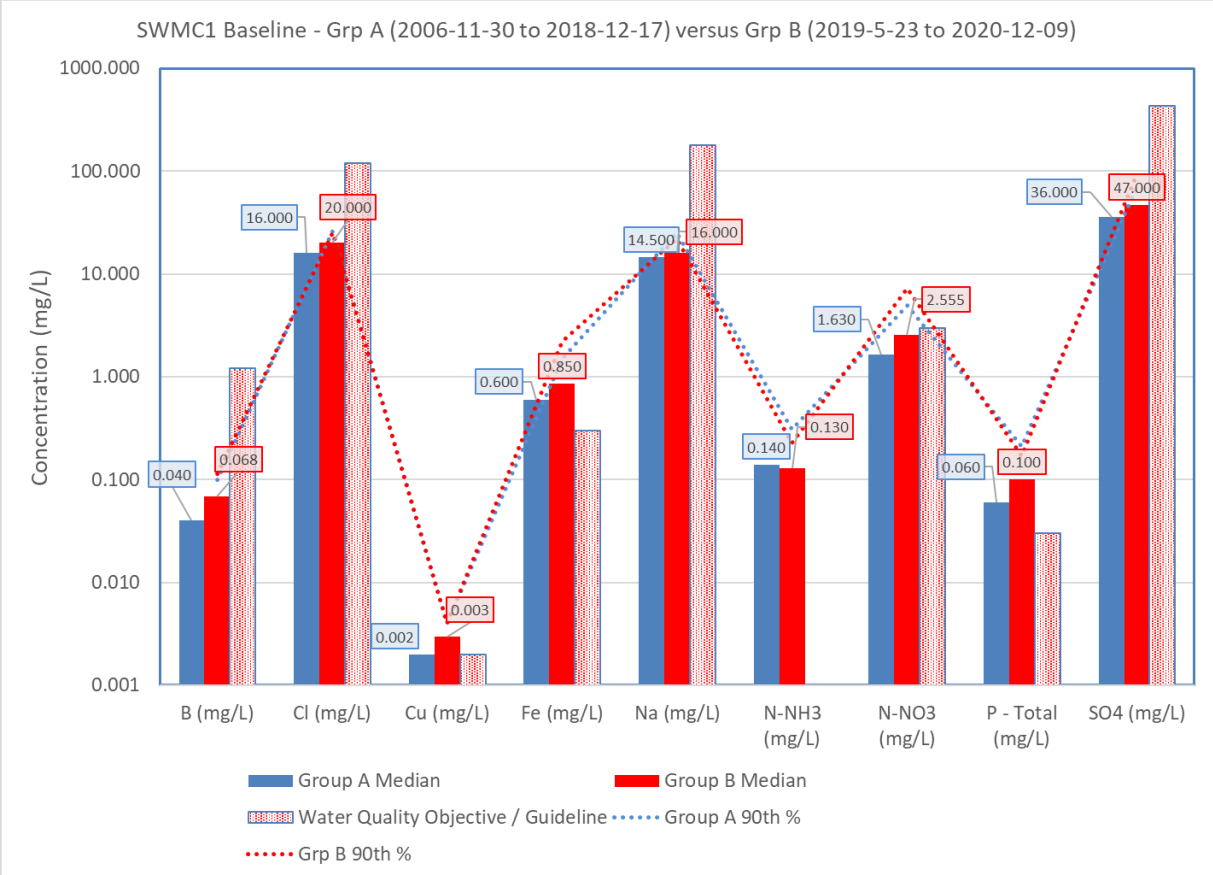
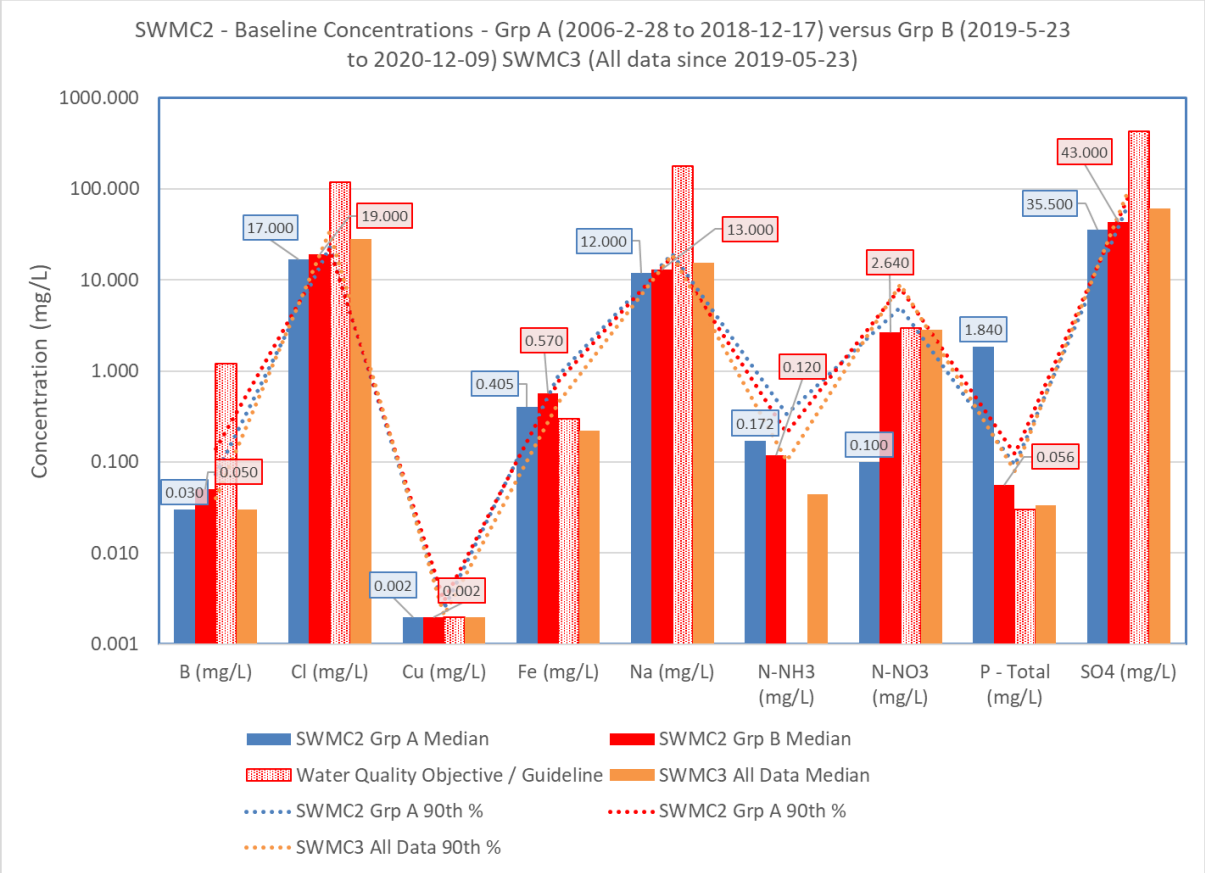


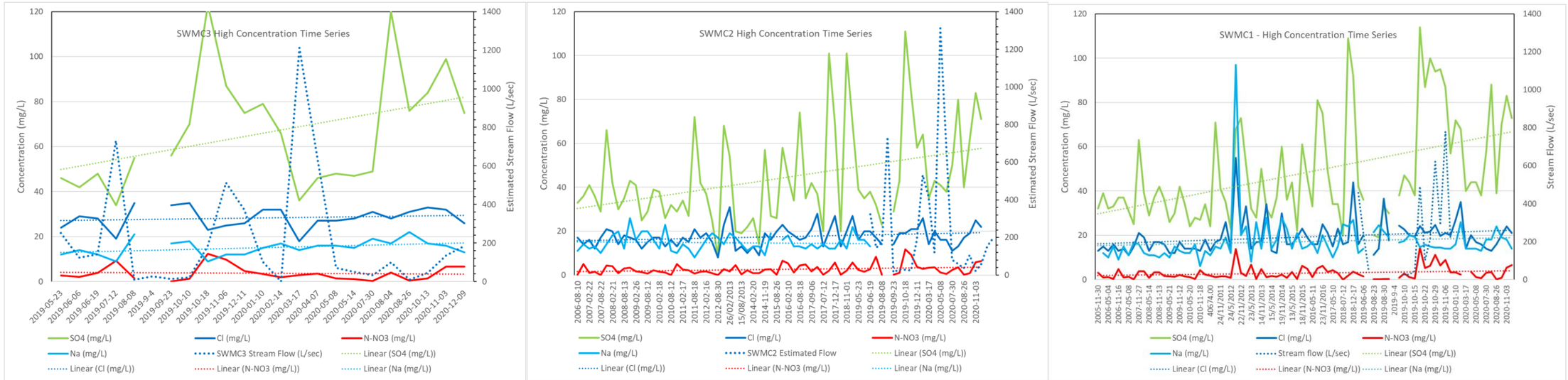
Figure 10 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC2 Comparing Group A samples (2006-08-10 to 2018-12-17) to Group B samples (2019-05-23 to 2020-12-09) and SWMC3 (all data). (Median values shown in data labels)



Aggregated data generally show little change between the two sampling periods at SWMC1 whereas at SWMC2 (upstream) all variables are similar between the two time periods except for NO_3-N which increased in Group B while TP was significantly lower in Group B than in the earlier data set. The patterns noted for NO_3-N and TP are not present downstream at SWMC1.

Detailed time series plots for key variables are presented for the three Moose Creek background stations in Figure 11. The low concentration variables have been plotted on a log scale to provide clarity. Trend lines are shown on the figures which are for illustrative purposes only and have not been tested for significance. SO_4 shows a rising trend both for the past two years at SWMC3 and for the past 14 years at SWMC2 and SWMC1. Background concentrations of SO_4 are now of the order of 80 to 100 mg/L. Cl, Na, B, and NO_3-N all show a slight upward trend over the period of record confirming the observations in Figure 10.

Figure 11 Time Series of Selected Water Quality Variables and Measured Streamflow (L/sec) for SWMC3 (2019-05-23 to 2020-12-09), SWMC2 (2006-08-10 to December 9, 2020) and SWMC1 (2006-11-30 to December 9, 2020) for High Concentration Time Series (Cl, Na, NO_3-N and SO_4) and Low Concentration Time Series (Boron, Cu, Fe, NH_3 -N and P-total)



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4.3.3.2 SWAF1

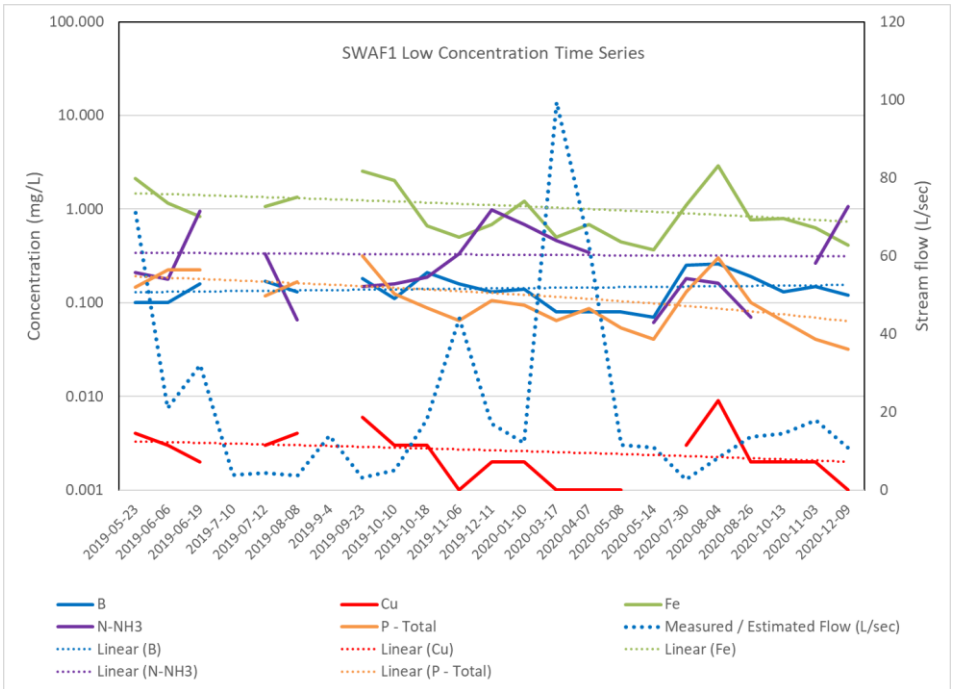
The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables are presented in Figure 12 and essentially show no trends for the last 20 months. SWAF1 median and 90th percentile water quality statistics are compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain in Table 16.

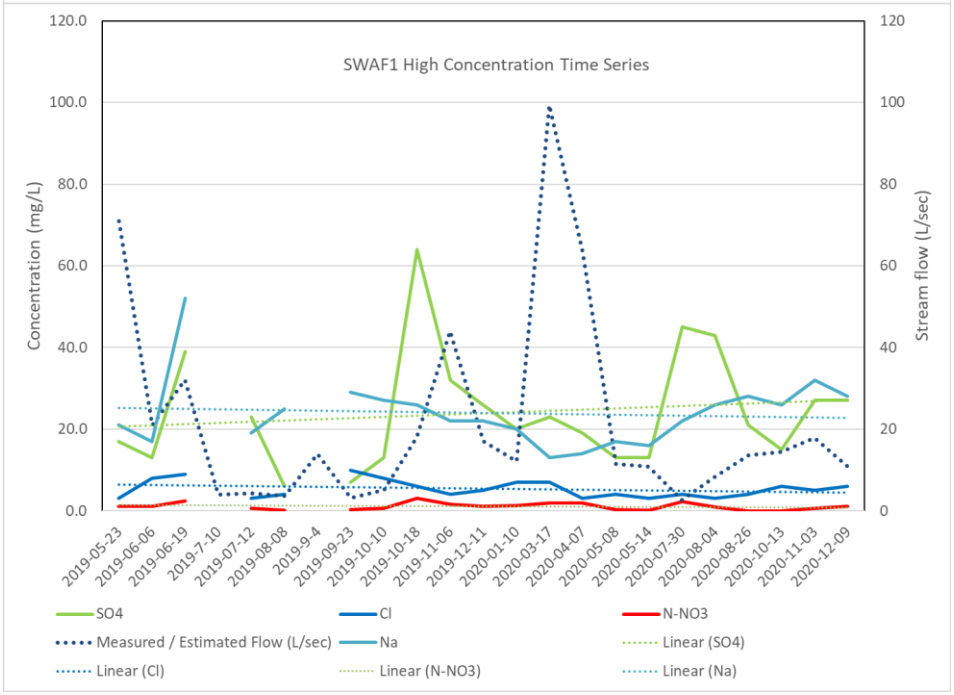
It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH_3-N and TP relative to samples from the last 20 months of monitoring at SWMC2. B, Fe and TP are an order of magnitude higher than SWMC2 for the period May 23, 2019 to Dec. 9, 2020. Observations have indicated that the continuous flow at SWAF1 is largely associated with the peat and natural forested areas which are more representative of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO_3-N and SO_4 than the Albert-Fahey Award Drain. Median concentrations exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e., pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert Fahey Award Drain with higher concentrations of B, Fe, Na, NH_3-N and TP and lower concentrations of Cl, NO_3-N and SO_4 than is currently typical of Moose Creek.

Table 16 Comparison of Water Quality Statistics for Albert Fahey Award Drain (SWAF1) to Downstream Moose Creek (SWMC2)

Parameter	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWAF1 Median (90th Percentile / # samples) 2019-05-23 to 2020-12-09	SWMC2 Median (90th Percentile / # samples) 2006-02-28 to 2018-12-17	SWMC2 Median (90th Percentile / # samples) 2019-05-23 to 2020-12-09
B (mg/L)	0.2	29 / 1.5	ND / 1.2	0.130 (0.210) / 21	0.030 (0.073) / 48	0.050 (0.140) / 21
Cl (mg/L)		600 / 150	600 / 150	5.0 (8.0) / 21	17 (23) / 48	19 (22) / 21
Cu (mg/L)		ND / 0.004	0.029 / ≤0.002	0.002 (0.004) / 20	0.0020 (0.0025) / 46	0.002 (0.003) / 21
Fe (mg/L)	0.3	ND / 0.3	0.001 / ND	0.80 (2.11) / 21	0.41 (0.90) / 48	0.057 (0.780) / 21
Na (mg/L)	180			22 (29) / 21	12.0 (19.3) / 48	13.0 (18.0) / 21
NH_3 -N (mg/L)				0.21 (0.96) / 19	0.17 (0.34) / 45	0.12 (0.21) / 19
NO_3-N (mg/L)		124 / 3.0	32.8 / 3.0	1.09 (2.24) / 19	1.84 (5.01) / 46	2.64 (8.31) / 21
P-Total (mg/L)	0.03			0.10 (0.23) / 21	0.040 (0.092) / 48	0.056 (0.123) / 21
SO4 (mg/L)			429	21.0 (43.0) / 21	35.5 (69.0) / 48	43.0 (83.0) / 21

Figure 12 Time Series of Selected Water Quality Variables for SWAF1 from May 23, 2019 to December 9, 2020 for "A" Cl, Na, NO_3-N and SO_4 and "B" Boron, Cu, Fe, NH_3 -N and P-total





4.3.3.3 SW1 at the Concession 7 Bridge

SW1 is the station on Moose Creek downstream of the inflow from Fraser Drain which incorporates the treated effluent discharged to Fraser Drain. Water quality samples have been collected at this location since July 12, 1996. However, prior to May 23, 2019, these surface water samples have tended not to coincide with effluent discharge events and consequently measurements prior to this date do not reflect conditions in the creek during effluent discharge. This is illustrated in Figure 13 where summary data (median and 90th percentile) for key water quality variables are presented for four time periods: Group A (1996-07-12 to 2007-08-01 and prior to effluent discharge); Group B (2007-08-01 to 2015-12-31 with limited effluent discharge); Group C (2016-01-01 to 2019-05-22 with upgraded leachate treatment facility but sampling did not coincide with discharge); and, Group D (2019-5-23 to 2020-12-09 with upgraded treatment and with all surface water samples collected during discharge events).

Data in Figure 13 show that generally there is little difference for most variables among the first 3 groups of data except for NO_3-N and TP which show a significant decline in Group B data but a return to higher concentrations in Group C. This is indicative of sampling at SW1 not coinciding with treated effluent discharges. Not surprisingly, median concentrations rise in Group D for B, Cl, Na, NO_3-N and SO_4 over all preceding data. These trends are directly associated with the quality of the effluent discharged to the surface waters and the fact that samples at SW1 coincide with effluent discharge during this time period. Group D concentrations, relative to historic data, are essentially unchanged or even decrease slightly for Cu, Fe, NH_3 -N and TP. Median concentrations for Group D samples do not exceed the PWQO or CCME/EBC long term water quality guidelines for B, Cl, Na and SO_4; however, the 90th percentiles for these variables exceed the PWQO/long term guidelines for all water quality variables. As noted, Group D median concentrations are comparable to historic water quality in Moose Creek for Cu, Fe, N-HN_3 and TP indicating that exceedances of PWQO/long term guidelines are a result of background conditions in Moose Creek and are not associated with the landfill treated effluent discharges. Detailed data and summary data are provided in Appendix F.

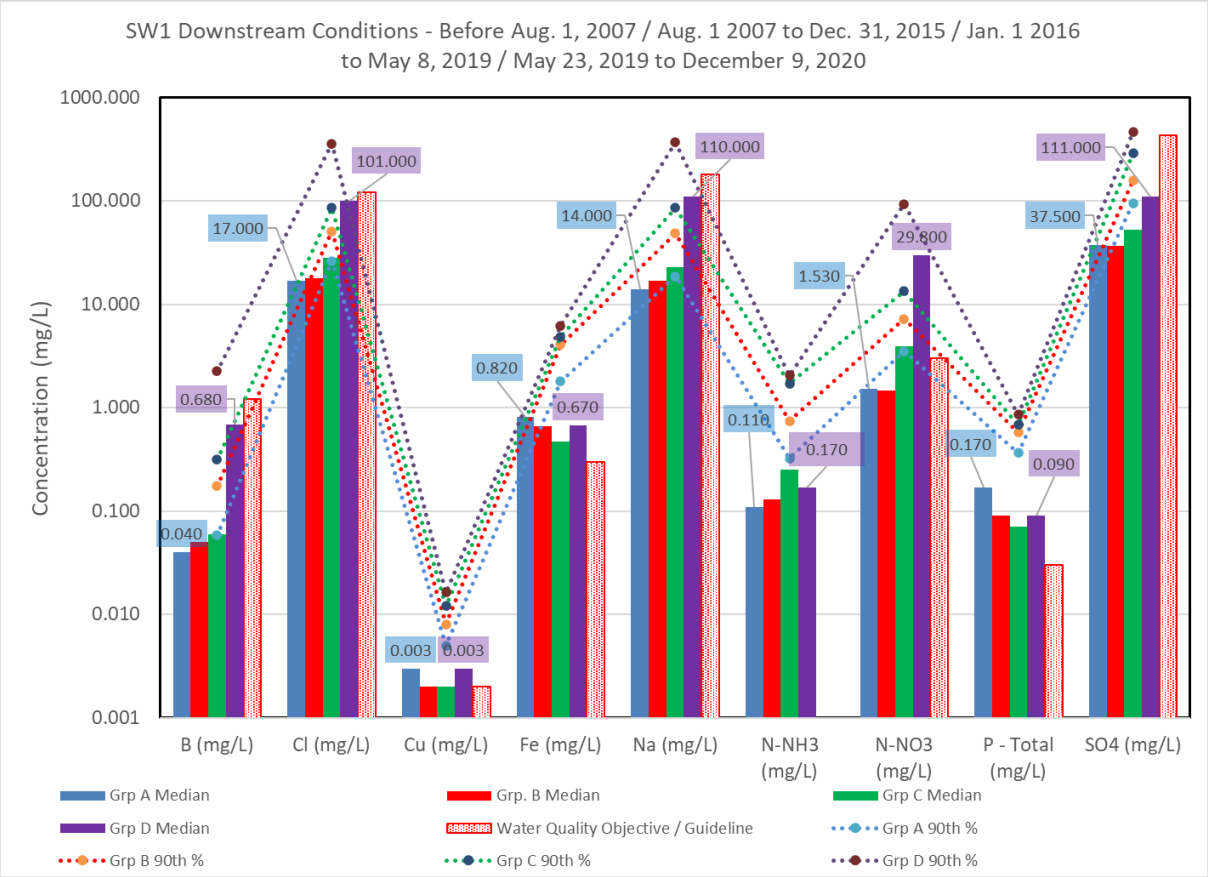
4.3.3.4 Effect of Effluent Discharge on Moose Creek

As noted above, only surface water data since May 23, 2019 has been sampled in association with treated effluent discharge events. Median concentrations and 90th percentiles for this time period (Group D) for upstream background stations SWMC2 and SWMC1, SW1 and SWMC5 are presented in Figure 14. SWMC5 is a new station further downstream of SW1 that is outside of the planned study area. Sampling commenced at this location only as of May 8, 2020 with only 8 samples to date which have been incorporated here as confirmation of the SW1 data. Note that as with other figures, the vertical scale is logarithmic.

Prior to May 23, 2019 water quality sampling at SW1 infrequently coincided with effluent discharge. Since this date, quality samples have been taken when the effluent discharge rate has been managed at between 10 and 50 L/sec such that it is more or less proportional to the flow in Moose Creek[9] as prescribed by draft

[9] *The discharge rates relative to instream flows during 2019 were managed as directed under the draft Provincial Officers Orders number 7622-BF3PGH (16/08/2019) which permitted discharge at a rate not to exceed 20 L/sec and a memo from L. Forrester dated 04/10/2019 and as confirmed in draft POO number 0157-BGRN6Sthat effluent could be discharged to Fraser Drain at a rate not to exceed 10 L/sec. Effluent discharge during 2020 has been dictated by a memo from L. Forrester dated 27/03/2020 which required a minimum dilution ratio of 5:1 (stream flow to effluent)with no discharge of treated effluent where streamflow in Moose Creek (without the influence of effluent) is less than 60 L/sec based on a 12 hour running average water level.*

Figure 13 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SW1 Comparing Group A (1996-7-12 to 2007-8-1); Group B (2007-8-1 to 2015-12-31); Group C (2016-1-1 to 2019-5-22); and Group D 2019-5-23 to 2020-12-09). Median Values for Group A and Group D Periods are Indicated Along with PWQOs or CCME/BC Environment Long Term Guidelines as Appropriate



Provincial Officers Order or directions from MECP. During 2019, discharge was prescribed at either 20 or 10 L/sec during the low flow season. Since May 22, 2020, continuous logging of Moose Creek water levels and a satisfactory rating curve for SW1 has permitted variable effluent discharge rates proportional to flow in the receiving waters such that a 5:1 assimilation ratio, based on a 12-hour average flow, was generally maintained. Effluent discharge was not permitted when receiving water flow was less than 60 L/sec based on a 12-hour running average water level exclusive of effluent discharge.

Changes in surface water quality medians for the data from May 23, 2019 to Dec. 9, 2020 at SW1 relative to upstream Moose Creek quality (SWMC2)[10] as illustrated in Figure 14 can be summarized as follows:

- Boron – median increases from 0.050 to 0.680 mg/L;
- Chloride – median increases from 19 to 101 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.570 to 0.670 mg/L;
- Sodium – median increases from 13 to 110 mg/L;
- Ammonia – median increases slightly from 0.120 to 0.170 mg/L;
- Nitrate – median increases from 2.64 to 29.80 mg/L;
- Phosphorus Total – median increases from 0.056 to 0.090 mg/L; and,
- Sulphate – median increases from 43 to 111 mg/L.

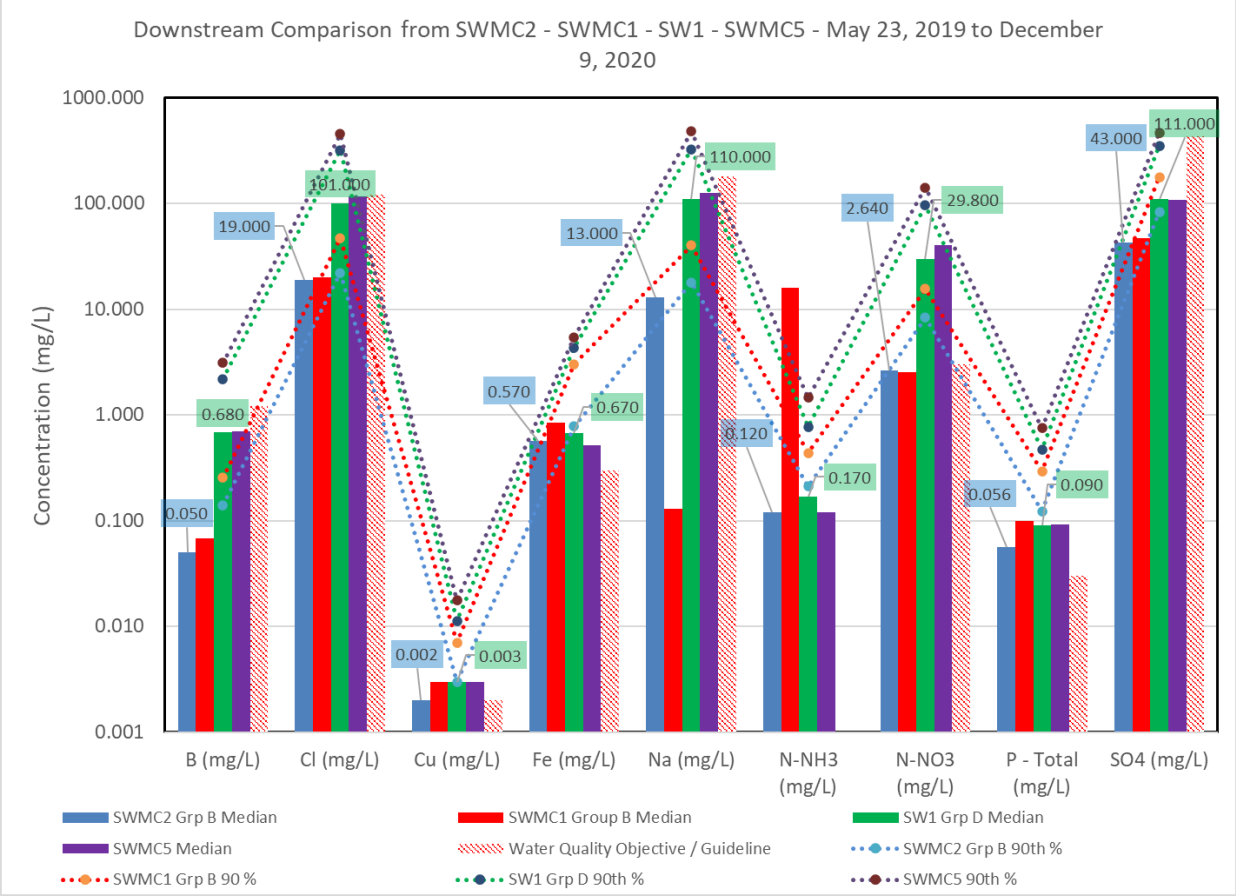
The change in Cu is likely too small to be anything more than natural variability. The apparent increase in Fe is not due to the release of the effluent which has a median concentration in the measured effluent in 2019 of 0.059 mg/L on 21 samples which is below the effluent limit for the LTF (1.0 mg/L) and an order of magnitude less than the median background concentration at SWMC2. Similarly, the effluent is not a significant contributor to the increase in TP at SW1 as the treated effluent has a median concentration for 2019 and 2020 of 0.080 mg/L (n = 47) an order of magnitude less than the effluent limit and slightly greater than the median background concentration. By comparison, TP concentrations at SWFD2, upstream of the effluent discharge location, have a median TP concentration of 0.268 mg/L suggesting that any increase in concentration of TP at SW1 is primarily a result of non-point sources to both Moose Creek and Fraser Drain.

Median concentrations of B, Cl, Cu, Fe, Na, NO_3-N and TP increase slightly between SW1 and SWMC5 (Figure 14) indicating some additional inputs for these parameters downstream of SW1. Na and Cl increases may be the result of road salting on Highway 417, while NO_3-N is likely related to non-point sources. NH_3-N, TP and SO_4 decrease or show no change.

Considering only the data collected since May 23, 2019 in Figure 14, it is evident that the median concentrations of the effluent mixed with flow in Fraser Drain result in a significant increase in the median concentration at SW1 relative to upstream Moose Creek (SWMC1 or SWMC2) for B, Cl, Na, NO_3-N and SO_4. The effluent generally does not result in exceedances of the PWQO or water quality guideline at SW1 based on the median concentrations except for NO_3-N. However individual worst case samples shown as the 90th percentiles do exceed the objectives or guidelines for B, Cl and Cu. These are considered further in Figure 15. Moose Creek background concentrations of Fe and TP exceed their respective PWQOs with the minor increases observed for these variables likely due to relatively high background concentrations in Fraser Drain. Treated effluent median concentrations for 2019 and 2020 are 0.062 mg/L and 0.080 mg/L for Fe and TP, respectively.

[10] *SWMC2 has been used as the reference site here as there is some evidence that the original location of SWMC1 may be impacted by backwater from the confluence of Fraser Drain with Moose Creek. Although this does not seem likely, SWMC1 was moved further upstream beginning in 2020 (CanDetec, Nov. 29, 2019).*

Figure 14 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC2, SWMC1, SW1 and SWMC5 from 2019-5-23 to 2020-12-09. Median Values for SWMC2 and SW1 are Indicated Along with PWQOs or CCME/BC Environment Long Term Guidelines as Appropriate



A comparison of summary water quality data for samples collected since May 23, 2019 for SWFD3 on Fraser Drain upstream of the discharge location, SW2 on Fraser Drain downstream of the discharge location, SWMC2 on Moose Creek upstream of the confluence with Fraser drain and SW1 downstream of the confluence with Fraser Drain is provided in Table 17. In this table, mean and standard deviation have been shown in addition to the count of samples for each variable that exceed the objective or guideline relative to the total number of samples for each station that exceed the MRL.

Table 17 PWQO and/or Water Quality Guideline Exceedances for Moose Creek Stations (SW1 and SWMC2) Compared to SW2 Station on Fraser Drain (Mean ± Standard Deviation [count >Objective or Guideline / count of samples above detection limit]) for Samples Between 2019-05-23 and 2020-12-09

Water Quality Parameter (mg/L)	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWFD3 on Fraser Drain Upstream of SW2 (2019-05-23 to 2020-12-09)	SW2 on Fraser Drain Upstream of Moose Creek (2019-05-23 to 2020-12-09)	SWMC2 on Moose Creek Upstream of Fraser Drain (2019-05-23 to 2020-12-09)	SW1 on Moose Creek Downstream of Fraser Drain (23/5/2019 to 26/8/2020)
Boron (B)	0.2	29 / 1.5	ND / 1.2	0.043±0.038 [0 / 34]	2.600±1.814 [6 / 29]	0.075±0.052 [0 / 21]	0.868±0.792 [6 / 29]
Chloride (Cl)		600 / 150	600 / 150	50±83 [2 / 34]	402±282 [7 / 29]	18.1±3.86 [0 / 21]	131±113 [12 / 29]
Copper (Cu)		ND / 0.004	0.029 / ≤0.002	0.002±0.001[10 / 34]	0.004±0.002 [6 / 29]	0.003±0.001 [7 / 21]	0.003±0.001 [18 / 29]
Iron (Fe)	0.3	ND / 0.3	0.001 / ND	0.348±0.307[11 / 34]	0.300±0.216 [3 / 29]	0.709±0.564 [20 / 21]	0.797±0.450 [27 / 29]
Sodium (Na)	180			24±27 [0 / 34]	427±289 [6 / 29]	14.1±3.0 [0 / 21]	137±120 [6 / 29]
Ammonia (NH_3-N)				0.112±0.217 [NA / 27]	0.433±0.513 [NA/ 29]	0.151±0.114 [NA / 19]	0.196±0.148 [NA / 29]
Un-ionized Ammonia	0.02			0.003±0.005 [0 / 17]	0.006±0.011 [4 / 21]	0.006±0.011 [12 / 15]	0.005±0.011 [2 / 21]
Nitrate (NO_3-N)		124 / 3.0	32.8 / 3.0	2.65±2.12 [13 / 30]	122.8±91.9 [7 / 28]	3.412±3.201 [9 / 21]	38.2±31.0 [27 / 29]
Total Phosphorus (TP)	0.03			0.077±0.051 [24 / 33]	0.190±0.108 [7 / 29]	0.075±0.054 [19 / 21]	0.115±0.056 [29 / 29]
Sulphate (SO_4)			429	53±16 [0 / 33]	279±191 [6 / 29]	53±23 [0 / 21]	123±70 [0 / 29]

Changes in surface water quality (means) at SW2 relative to upstream Fraser Drain quality at SWFD3 from Table 17 can be summarized as follows:

- Boron – mean increases by two orders of magnitude from 0.043±0.038 to 2.600±1.814 mg/L (background is less than BCMOE guideline of 1.2 mg/L but SW1 is greater but with a high standard deviation due to highly variable B concentrations in effluent);
- Chloride – mean increases from 50±83 to 402±282 mg/L (mean at SW2 double CCME guideline of 120 mg/L);
- Copper – mean shows little change from 0.002±0.001 to 0.004±0.002 mg/L (less than PWQO of 0.005 mg/L but both greater than BCMOE guideline of <0.002 mg/L);
- Iron – mean reduces due to low concentrations in effluent from 0.348±0.307 to 0.300±0.216 mg/L (both slightly greater than the PWQO of 0.3 mg/L);
- Sodium – mean increases from 24±27 to 427±2895 mg/L (background well below MECP Aquatic Protection Value (APV) of 180 mg/L but SW2 double the APV and highly variable);
- Ammonia – mean increases from 0.112±0.217 to 0.433±0.513 mg/L;
- Un-ionized Ammonia - mean increases very slightly from 0.003±0.005 to 0.006±0.011 mg/L (both an order of magnitude less than the PWQO of 0.02 mg/L);
- Nitrate – mean increases from 2.65±2.12 to 12.8±91.9 mg/L (background meets the CCME guideline while SW2 is an order of magnitude above the CCME guideline of 3.0 mg/L);
- Phosphorus Total – mean increases from 0.077±0.051 to 0.190±0.108 mg/L (both in excess of the PWQO of 0.03 mg/L); and,
- Sulphate – mean increases from 53±16 to 279±191 mg/L (both are well below the BCMOE guideline of 429 mg/L).

Changes in surface water quality (means) at SW1 relative to upstream Moose Creek quality at SWMC2[11] from Table 17 can be summarized as follows:

- Boron – mean increases by an order of magnitude from 0.075±0.052 to 0.868±0.792 mg/L (both less than BCMOE objective of 1.2 mg/L);
- Chloride – mean increases from 18.1±3.86 to 131±113 mg/L (mean at SW1 slightly above CCME guideline of 120 mg/L);
- Copper – mean shows no change from 0.003±0.001 to 0.003±0.001 mg/L (less than PWQO of 0.005 mg/L but greater than BCMOE guideline of >0.002 mg/L);
- Iron – mean increases slightly from 0.709±0.564 to 0.797±0.450 mg/L (both double the PWQO of 0.3 mg/L);
- Sodium – mean increases by an order of magnitude from 14.1±3.0 to 137±120 mg/L (both below MECP Aquatic Protection Value (APV) of 180 mg/L);
- Ammonia – mean increases slightly from 0.151±0.114 to 0.196±0.148 mg/L;

[11] *SWMC2 has been used as the reference site here as there is some evidence that the original location of SWMC1 may be impacted by backwater from the confluence of Fraser Drain with Moose Creek. Although this does not seem likely, SWMC1 was moved further upstream beginning in 2020 (CanDetec, Nov. 29, 2019).*

- Un-ionized Ammonia - mean decreases slightly from 0.006±0.011 to 0.005±0.011 mg/L (both an order of magnitude less than the PWQO of 0.02 mg/L);
- Nitrate – mean increases from 3.41±3.20 to 38.2±31.0 mg/L (background exceeds the CCME guideline while SW1 is an order of magnitude above the CCME guideline of 3.0 mg/L);
- Phosphorus Total – mean increases from 0.075±0.054 to 0.115±0.056 mg/L (both in excess of the PWQO of 0.03 mg/L); and,
- Sulphate – mean increases from 54±23 to 123±70 mg/L (both are well below the BCMOE guideline of 429 mg/L).

Time series plots for key water quality variables for SW1 compared to SWMC2 (upstream) for 2019-05-23 to 2020-12-09 are presented in Figure 15. What is evident in Figure 15 is that the treated effluent discharges during October 2019, which were limited to discharge rates of 10 L/sec, and throughout 2020, which were at effluent discharge rates proportional to instream flows at SW1 up to a maximum effluent discharge rate of 50 L/sec, result in more consistent water quality concentrations at SW1. The variability is generally a result of greater dilution of the effluent due to high in-stream flows such as on March 17, 2020 and April 7, 2020. Flows in the middle of March 2020 were too high to be safely measured while measured flows on April 7 were 1,408 L/sec.

Cl concentrations exceeded the CCME guideline on June 6, 2019, Aug. 23, 2019 and Aug. 27, 2019 when in-stream flows were 304, 36 and 38 L/sec and treated effluent discharge rates were 50, 20 and 20 L/sec, respectively. Over the winter of 2019/2020 ((December, January and February) Cl concentrations again exceeded the guideline with effluent discharge at 50 L/sec and in-stream flows of 339, 44 and 10 L/sec for December, January and February, respectively. Discharge events of 50 L/sec on May 8, 2020 and May 14, 2020 exceeded the guideline with in-stream flows (ratios of flow to discharge) of 263 (~5.3:1) and 190 (~3.8:1) L/sec.

NO_3-N exceeds the CCME guideline at Moose Creek background stations and is an order of magnitude greater than the guideline even during the flow proportioned discharge events of 2020. Even the high in-stream flows such as on March 17, 2020 and April 7, 2020 (dilution ratio of 28:1) do not sufficiently mitigate the NO_3-N concentrations in the effluent indicating that dilution alone does not provide compliance with current water quality guidelines. Alternatively, the guideline may be over-protective of the aquatic environment as toxicity tests in hard waters typical of Moose Creek have not been evaluated (CCME, 2012; Golder, 2020).

SO_4 has never exceeded the BCMOE guideline and will not pose a problem in the receiving waters if the treated effluent discharge rate is managed to protect the aquatic system with respect to Cl.

The time series for B, Cu, Fe, NO_3-N and TP are illustrated in Figure 15. B is similar to Cl, as discussed above, in that concentrations exceed the BCMOE guideline during discharge events of 50 L/sec with modulation of the discharge rate based on the in-stream discharge. The dilution ratios maintained during the October 2019 and spring/summer 2020 discharge events resulted in B concentrations at SW1 below the guideline.

NH_3-N is highly variable with lowest concentrations associated with high flows in Moose Creek. There is no objective or standard for NH_3-N, so ammonia is managed based on the calculated un-ionized ammonia concentration. Exceedances occurred at SW1 on only 2 of 21 events (2020-01-10 and 2020-08-04) while upstream Moose Creek (SWMC2) concentrations exceeded the PWQO of 0.02 mg/L a total of 12 out of 15 samples including each of the sample dates that the objective was exceeded at SW1. While there is some reduction in un-ionized ammonia concentrations between SWMC2 and downstream at SWMC1, the sample

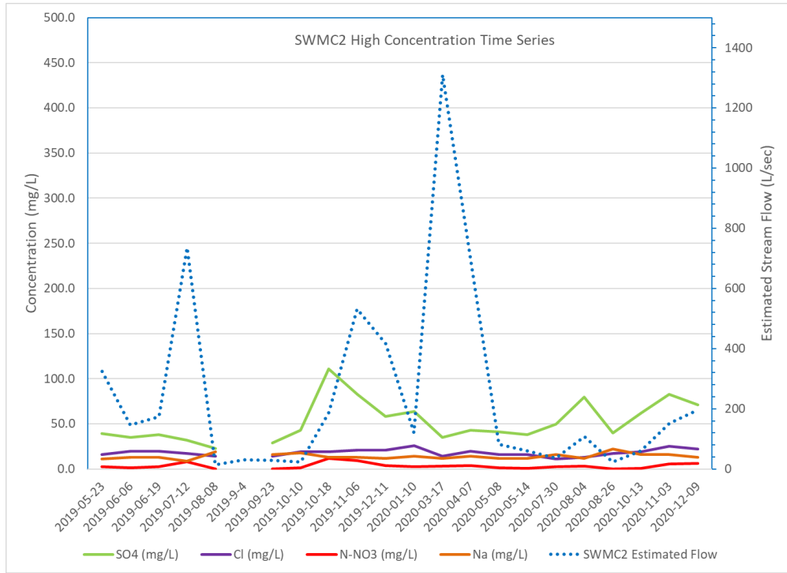
at SWMC1 exceeded the objective on Aug. 4, 2020. The low ammonia concentrations at SW1 indicate that ammonia toxicity due to effluent discharge is being managed currently.

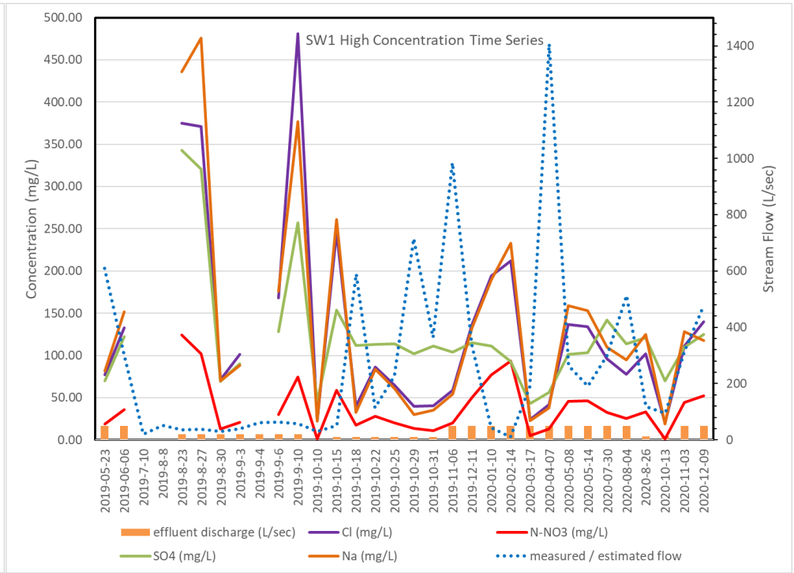
TP exceeds the PWQO on all sampling events. In general, the high TP concentrations at SW1 are controlled by high background concentrations in the receiving waters with little influence based on flow proportional discharge ratios.

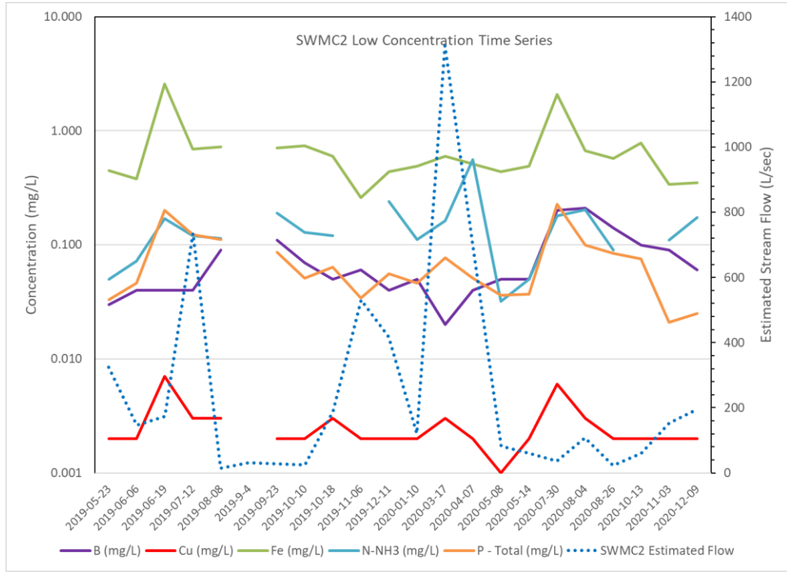
Fe concentrations are consistently in excess of the PWQO due largely to the high background concentrations in the receiving waters. Although concentrations at SW1 have been relatively consistent during 2020, the reduction of Fe in the effluent or further changes to the ratio of receiving water to effluent will have little to no impact on Fe concentrations in the receiving water.

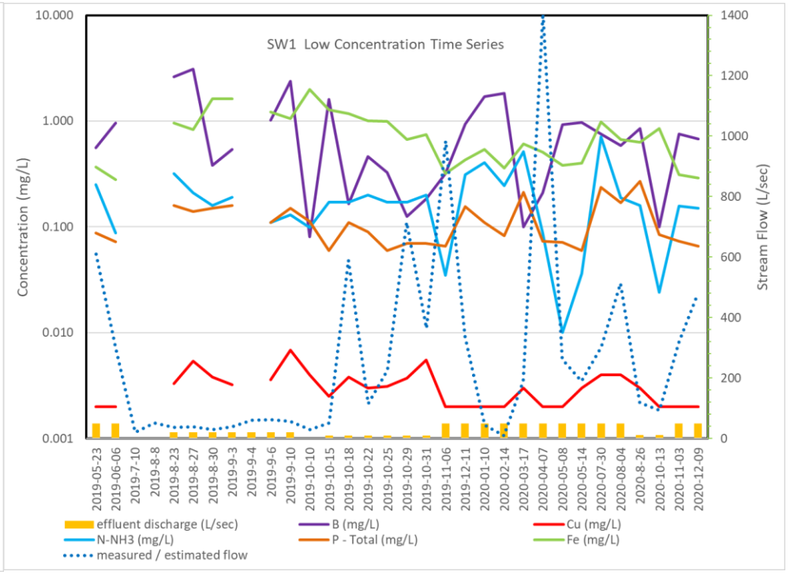
Cu concentrations are not highly affected by the effluent and are generally controlled by the background concentrations in the receiving waters and remain below the PWQO.

Figure 15 Time Series of Selected Water Quality Variables for SW1 Compared to Upstream Moose Creek at SWMC2 from 2019-05-23 to 2020-12-09 for "High Concentrations" (Cl, Na, NO_3-N and SO_4) and "Low Concentrations" (Boron, Cu, Fe, NO_3-N and P-total)









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4.3.4 Upper-Tayside Drain Station (SWLTD1)

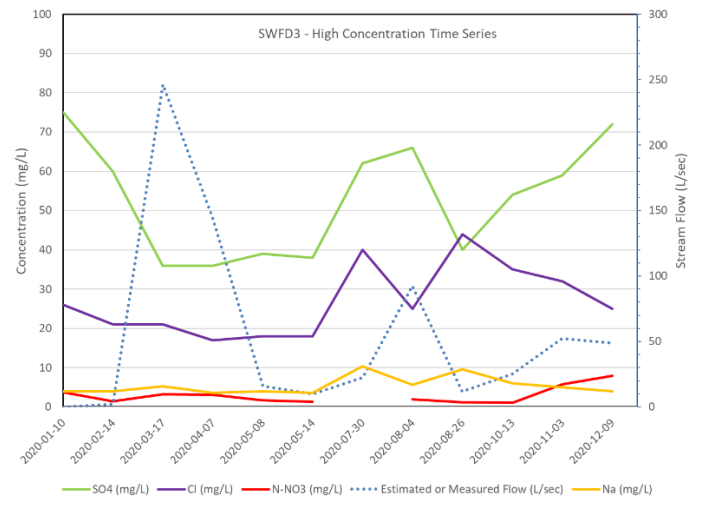
The Upper-Tayside drain is on the western edge of the proposed landfill expansion. As illustrated in Figure 1 it has a catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17,2020. Based on the mean concentrations, SWLTD1 concentrations for 2020 of Na, NH_3-N, NO_3-N and TP were double those of SWFD3 for both 2019 and 2020 and B was higher (Table 18). Other variable were similar or lower than SWFD3 concentrations.

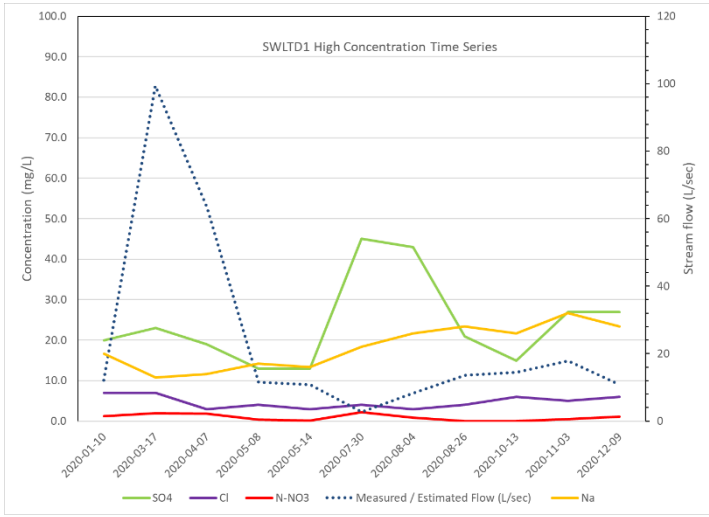
Time series concentrations for SWFD3 and SWLTD1 for the 2020 sampling season are compared in Figure 16. A qualitative comparison of the two water courses indicates that concentration were similar at both locations for NO_3-N, B, Cu, Fe and NH_3-N, lower in SWLTD1 for SO_4 and Cl but noticeably higher in SWLTD1 for Na and TP. Further monitoring is required to determine if these differences are consistent and adequately represent existing conditions.

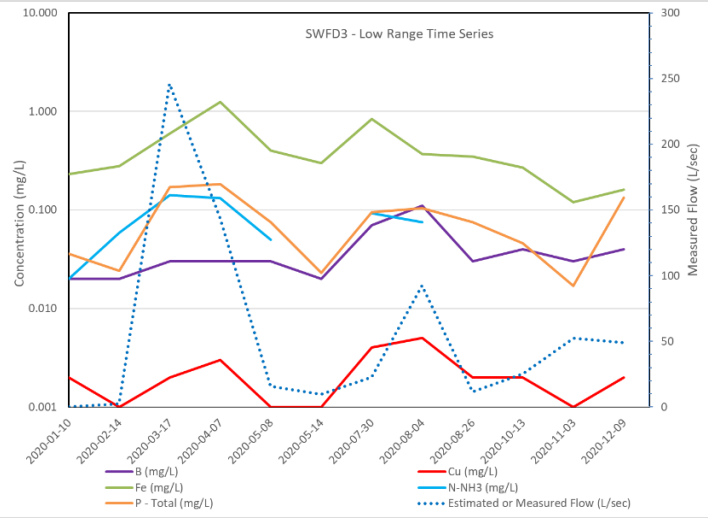
Table 18 Summary Water Quality Data for Upper-Tayside Drain Station SWLTD1 (Mean ± Standard Deviation [count >Objective or Guideline / count of samples above detection limit])

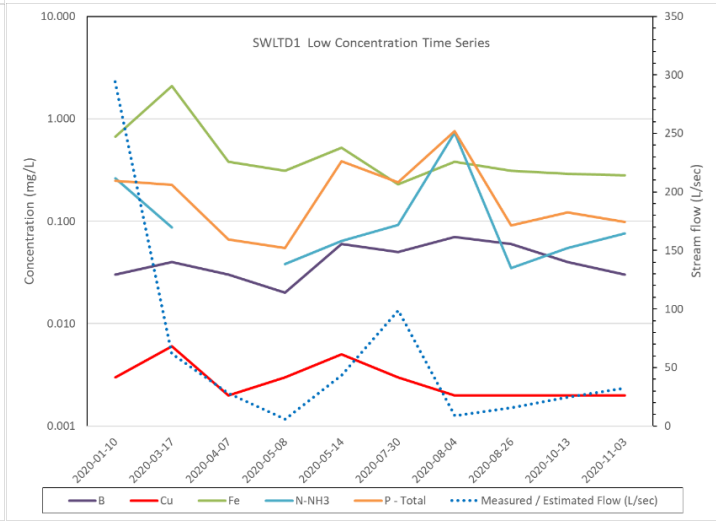
Water Quality Parameter (mg/L)	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWLTD1 at Highway 138 (2020-03-17 to 2020-12-09)
Boron (B)	0.2	29 / 1.5	ND / 1.2	0.043±0.016 [0 / 10]
Chloride (Cl)		600 / 150	600 / 150	65±23 [0 / 10]
Copper (Cu)		ND / 0.004	0.029 / ≤0.002	0.003±0.0014 [5 / 10]
Iron (Fe)	0.3	ND / 0.3	0.001 / ND	0.55±0.56 [7 / 10]
Sodium (Na)	180			40±18 [0 / 10]
Ammonia (NH_3-N)				0.16±0.22 [NA / 9]
Un-ionized Ammonia	0.02			0.006±0.008 [1 / 9]
Nitrate (NO_3-N)		124 / 3.0	32.8 / 3.0	5.59±3.31 [7 / 10]
Total Phosphorus (TP)	0.03			0.23±0.021 [10 / 10]
Sulphate (SO_4)			429	46±10 [0 / 10]

Figure 16 Time Series of Selected Water Quality Variables for SWFD3 and SWLTD1 (2020-03-17 to 2020-12-09) for "High Concentrations" (Cl, Na, NO_3-N and SO_4) and "Low Concentrations" (Boron, Cu, Fe, NO_3-N and P-total)









4.3.5 Indicators of Potential Surface Water Toxicity in Moose Creek

4.3.5.1 Un-ionized Ammonia in Receiving Water at SW1

Since 2016, only two samples have tested with un-ionized ammonia greater than the objective (2020-01-10 [0.032 mg/L] and 2020-08-04 [0.042 mg/L]). Background Moose Creek concentrations at SWMC1 met the PWQO on Jan. 10, 2020 but were 0.026 mg/L on Aug. 4, 2020. As noted above, Fraser Drain had high background concentrations on this date as well indicating that this exceedance was a natural occurrence and not attributable to the discharge of treated effluent.

4.3.5.2 Aquatic Toxicity

Golder Associates Ltd. is currently reviewing all acute and chronic toxicity data for the EOWHF (Golder, 2020). Further, research on parameter specific toxicity assessments are currently in progress by Golder. The outcome of this detailed work is focused on the effluent and its effects and is not directly relevant to this existing conditions report.

4.3.5.3 Other Potentially Toxic Metals and Bio-accumulative Compounds

Summary data for other potentially toxic metals and bio-accumulative organic contaminants in the treated effluent and in the receiving waters downstream of the discharge location are summarized in Table 19 for May 23, 2019 to Dec. 9, 2020. This time period was selected as the sampling in the receiving waters is confirmed to be during discharge events. In summary:

- Cd was detected rarely in the treated effluent and never exceeded the method reporting limit (MRL) in the receiving waters;
- Cr was consistently detected in the effluent and in the receiving waters but none of the receiving water samples exceeded the PWQO;
- Pb was detected about 50% of the time in the treated effluent but no samples of the receiving water exceeded the PWQO;
- Hg was detected about 20% of the time in the treated effluent but no samples of the receiving water exceeded the PWQO; and,
- None of 1,4-dichloro-benzene, benzene, dichloromethane, toluene and vinyl chloride exceed their respective MRL in either the treated effluent or the receiving waters.

Table 19 Summary of Analytical Results for Potentially Toxic and Bio-accumulative Compounds in the Treated Effluent and Receiving Water – 2019-05-23 to 2020-12-09

Water Quality Parameter	PWQO / Regulatory Limit	Treated Leachate - Exceedance of PWQO / Regulatory Limit	Treated Leachate - Number of samples > MRL/ Number of Samples*	Treated Leachate Mean Concentration ± 1 SD	SW2 Median / 90th Percentile (no. > PWQO / no. > MRL)	SW1 Median / 90th Percentile (no. > PWQO / no. > MRL)
Cadmium (mg/L)	0.0002/NA	0/NA	3/47	0.0001 ± 0.00003	≤MRL	≤MRL
Chromium (mg/L)	0.0089/NA	0/NA	47/47	0.013 ± 0.012	0.007 / 0.011 (0 / 30)	0.003 / 0.005 (0 / 29)
Lead (mg/L)	0.025/ NA	0/NA	29/47	0.0003 ± 0.0006	0.0002 / 0.0005 (0 / 0)	0.0004 / 0.0009 (0 / 12)
Mercury (mg/L)	0.0002/NA	9/NA	11/47	0.00005 ± 0.00004	0.0001 / 0.0001 (0 / 0)	0.00003 / 0.00003 (0 / 2)
1,4-dichloro-benzene (µg/L)	4/NA	0/NA	4/47	≤MRL	≤MRL	≤MRL
Benzene (µg/L)	100/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Dichloromethane (µg/L)	100/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Toluene (µg/L)	0.8/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Vinyl chloride (µg/L)	600	0/NA	0/47	≤MRL	≤MRL	≤MRL

*MRL = Method Reporting Limit, #NA = Not Applicable

5. Conclusions

Water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow information for the water courses. The initial review of the historical data demonstrated that:

i. Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near EOWHF;

ii. Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any overlap with periodic treated effluent discharge events in Fraser Drain and Moose Creek;

iii. Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018; and,

iv. Since May 2019, in part in response to the need for existing condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters and the potential effect of the Phase 2 of the existing landfill, water quality and quantity monitoring in the receiving waters was enhanced in 2019 and again in 2020.

This report characterized existing conditions of the surface waters with respect to quality in the vicinity of the existing landfill and the expansion site. All sampling locations on Fraser Drain, upstream of the effluent discharge location, were considered as existing conditions unaffected by the existing landfill for the period of record of data. Similarly, Moose Creek sites upstream of the confluence with Fraser Drain were considered as existing conditions uninfluenced by the EOWHF. The Albert Fahey Award Drain site as well as the Upper-Tayside drain characterize existing conditions typical of peat and natural forested areas and of the proposed expansion site, respectively.

Fraser Drain, downstream of the effluent discharge location and Moose Creek below the confluence with Fraser Drain were considered in four periods to assess trends or changes as a result of the effluent discharge. These periods are pre-discharge (1996 to 2007), early discharge without an emphasis on alignment with discharge events monitoring (2007 to 2015), discharge following upgrades to the treatment of the effluent but limited alignment with discharge events, and 2019 and 2020 monitoring intended to be synoptic monitoring with treated effluent discharge events.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in impacts on water quality in these water courses and an altered hydrology which have significantly affected existing conditions *vis a vis* natural or historic conditions. Historic conditions have not been emphasized in this report with the exception of water quality of the Albert-Fahey Award Drain. Throughout the study area, existing water quality conditions in the surface waters are generally poor with high concentrations of TP, Fe, NO_3-N and un-ionized ammonia. Poor quality is exacerbated by extreme hydrologic conditions (rapid runoff altered by agricultural drainage and the construction of straight, un-natural U-shaped channels) that result in extremely low baseflow or even dry-ditch conditions.

General time trends for upstream Fraser Drain stations SWFD4, SWFD3, and SWFD2 for the period of record show increasing concentrations for SO_4, Cl, Fe, Na and NO_3-N at most of the sample locations. The high variability over time for concentrations with these samples is likely associated with flow but there are insufficient data to assess the effects of low and high flows on water quality. The data have been sorted into Group A and Group B characterizing the period of sampling from 1996 to May 8, 2019 and from May 23, 2019 to Dec. 9, 2020, respectively. Median concentrations for SWFD4 Group B (2019-05-23 to 2020-12-09) have doubled for boron (0.010 for Group A to 0.020 mg/L for Group B), tripled for NO_3-N (0.885 to 2.245 mg/L for Group A and B, respectively) and increased by 10 mg/L for Cl (17.5 to 27.0 mg/L for Group A and B respectively) but show little change for NH_3 -N and TP.

In general, median concentrations for SWFD3 Group B (2019-05-23 to 2020-12-09) have increased noticeably for Cl (17.0 to 31.0 mg/L for Group A and B respectively) and have increased for Na (12.0 to 17.0 mg/L for Group a and B respectively), NO_3-N (0.96 to 1.98 mg/L for Group A and B, respectively), and SO_4 (33.0 to 55.0 for Group A and B, respectively). P-Total increased slightly (0.050 to 0.060 for Group A and B, respectively).

Three stations were selected for evaluation of existing or background conditions in Moose Creek including SWMC1 above the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek and SWMC3 downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1. It was observed that there is little change in quality between SWMC3 and SWMC2 for the comparable data from May 23, 2019 to Dec. 9, 2020. Aggregated data generally show little change between the two sampling periods (pre- and post- May 23, 2020) at SWMC1 whereas at SWMC2 (upstream) all variables are similar between the two time periods except for NO_3-N which increased post May 23, 2019 while TP was noticeably lower in the latter time period. The patterns noted for NO_3-N and TP are not present downstream at SWMC1. Detailed time series plots for key variables for the three Moose Creek background stations indicate that SO_4 shows a rising trend both for the past two years at SWMC3 and for the past 14 years at SWMC2 and SWMC1. Concentrations are now of the order of 80 to 100 mg/L as background. Cl, Na, B and NO_3-N all show a slight upward trend over the period of record.

The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables show no trends for the last 20 months. SWAF1 median and 90th percentile water quality statistics were compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain. It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH_3-N and TP especially relative to samples from the last 20 months of monitoring. B, Fe and TP are an order of magnitude higher than SWMC2 for the period May 23, 2019 to Dec. 9, 2020. Observations have indicated that the continuous flow at SWAF1 is largely associated with the peat and natural forested areas which are more representative of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO_3-N and SO_4 than the Albert-Fahey Award Drain. Median concentrations at SWAF1 exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e. pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert Fahey Award Drain with higher concentrations of B, Fe, Na, NH_3-N and TP and lower concentrations of Cl, NO_3-N and SO_4 than is currently typical of Moose Creek.

Changes in surface water quality (medians for the data from May 23, 2019 to Dec. 9, 2020) at SW1 relative to upstream Moose Creek quality (SWMC2) indicate the effect of the input of Fraser Drain and the treated effluent discharge to Fraser Drain can be summarized as follows:

- Boron – median increases from 0.050 to 0.680 mg/L;
- Chloride – median increases from 19 to 101 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.570 to 0.670 mg/L;
- Sodium – median increases from 13 to 110 mg/L;
- Ammonia – median is unchanged at 0.120 to 0.170 mg/L;
- Nitrate – median increases from 2.64 to 29.80 mg/L;
- Phosphorus Total – median increases from 0.056 to 0.090 mg/L; and,
- Sulphate – median increases from 43 to 111 mg/L.

The Upper-Tayside Drain is on the western edge of the proposed landfill expansion. It has a catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17, 2020. Based on the mean concentrations, SWLTD1 concentrations for 2020 of Na, NH_3-N, NO_3-N TP were double those of SWFD3 for both 2019 and 2020 and B was higher. Other variables were similar or lower than SWFD3 concentrations.

6. Report Limitations and Use

This Report has been prepared by CanDetec Inc. (Consultant) for the benefit of GFL Environmental Inc. (Client) in accordance with the agreement between CanDetec Inc. and the Client, including the scope of work detailed in the proposal and subsequent scope changes to this scope of work.

The information, data, recommendations and conclusions (collectively the "Information") contained in the Report represents CanDetec's professional judgement in light of the Limitations of the information available from the Client and industry standards for the preparation of similar reports. The report may be based on information provided to the Consultant which has not been independently verified; has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued. The Report must be read as a whole and sections thereof should not be read out of context with the Report and with these limitations.

The Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. The Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of surface water, environmental or geoscience conditions, is not responsible for any variability in such conditions, geographically or over time.

The Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable effects of the activities considered in this Report by the Consultant represent the Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Persons relying on such estimates or opinions do so at their own risk.

Except as agreed to in writing by Consultant and Client; as required by-law; or to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by the Client.

The Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than the Client who may obtain access to the Report or the Information, for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report") except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

7. Closure

CanDetec is pleased to provide GFL with this report in accordance with the agreement and the scope of work detailed in the Proposal to undertake this work and any subsequent scope changes to the proposed work. This review was conducted by the undersigned based upon the material contained in the reports referenced herein.

CanDetec appreciates the opportunity to assist GFL with this critical work to expanding the EOWHF landfill. We trust that this report meets your expectations fully. If you have any questions on this report or identify any omissions or errors in fact that need to be addressed to finalize this report, please provide these to the undersigned.

Thank you again for providing CanDetec with this opportunity.

Report Prepared By:

Dennis J. Gregor PhD., P. Geo.

President, Senior Aquatic Scientist

8. References

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Selected Photographs

Photograph 1 Upstream view of SWFD4 (2019-05-23)

Photograph 2 Upstream of Fraser Drain culvert at Laflèche Road (2020-12-09)

Photograph 3 Looking upstream at SWFD3toward Laflèche Road culvert (2019-05-23)

Photograph 4 View of Treated Effluent Discharge Stream entering Fraser Drain (2019-05-23)

Photograph 5 Upstream View of Fraser Drain Looking East Past Inflow of Treated Effluent (2019-05-23)

Photograph 6 Fraser Drain Looking West from Twin Culverts and Downstream of Effluent Discharge (2019-05-23)

Photograph 7 Downstream view from bridge at SWMC3 (2019-05-23)

Photograph 8 Upstream view at SWMC2 (2019-05-23)

Photograph 9 View downstream from SWMC1 toward SW1. Fraser Drain enters Moose Creek from right side at trees located in background (2019-05-23)

Photograph 10 View of SW1 looking upstream from concession Road # 7 bridge

Appendix A

Correspondence from MECP Regarding Effluent Discharge – June 27, 2019

Appendix L

Correspondence from T. Forrester, MECP, June 27, 2019

Greg van Loenen

From: Forrester, Terri (MECP) <Terri.Forrester@ontario.ca>
Sent: Thursday, June 27, 2019 12:34 PM
To: Greg van Loenen; Daniel Brien
Cc: Seguin, Michael (MECP); Forrester, Lauren (MECP)
Subject: FW: GFL-EOWHF 2018 AMR SW Review
Attachments: lf-tf-EOWHF 2018 AMR SW Review (final).pdf

Importance: High

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Greg, Daniel

Attached is the review memo for the 2018 annual monitoring report. There is some very concerning information within the annual report, as summarized in the attached memo.

Of utmost urgency is the potential for treated effluent to cause impairment of the receiver, specifically during low flow conditions. Along with meeting effluent limits, GFL also has a responsibility to comply with section 30 of the OWRA:
30 (1) Every person that discharges or causes or permits the discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters is guilty of an offence. R.S.O. 1990, c. O.40, s. 30 (1).

Treated effluent discharges during low flow conditions (May 15 to October 31) must be discontinued immediately, unless GFL provides analytical reports to demonstrate that treated effluent quality -including the parameters of concern identified in the memo- adheres to the aquatic protection values stipulated in the attached memo (CCME / PWQO / CWQG).

I don't feel this will cause hardship or difficulties in the short-term, as there should be adequate storage capacity within the wetlands / treated effluent holding ponds / north holding pond / pre-treated holding pond. Once we've had some time to digest the information in the memo I'd like to either meet or teleconference to discuss moving forward.

Thank you

**please note the changes to my phone number

Terri

Terri-Lee Forrester
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
Cornwall Area Office
113 Amelia Street, Cornwall, ON, K6H-3P1
Direct line (mobile) 613-930-3599; Fax 613-933-6402
Spills Action Centre 1-800-268-6060

Provincial Officers Order 7622-BF3PGH

Appendix B

Draft Provincial Officer's Order (POO) 7622 – BF3PGH, Jan. 27, 2019

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

Provincial Officer's Order

DRAFT

Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA)
Ontario Water Resources Act, R.S.O. 1990, c. O.40 (OWRA)
Pesticides Act, R.S.O. 1990, c. P.11 (PA)
Safe Drinking Water Act, 2002, S.O. 2002, c.32 (SDWA)
Nutrient Management Act, 2002, S.O. 2002, c.4 (NMA)

Order Number
7622-BF3PGH

Incident Report No.
2761-BATN2D

To: GFL Environmental Inc.
Suite 500 - 100 New Park Pl
Vaughan, Ontario, L4K 0H9
Canada

Site: 17125 Lafléche Rd
North Stormont, United Counties of Stormont Dundas and Glengarry

Pursuant to my authority under OWRA Section 16.1, OWRA Section 16 and EPA Section 157.1, I order you to do the following:

Work Ordered

Item No. 1 **Compliance Date** 2019/08/16
(YYYY/MM/DD)

Conduct a discharge of treated effluent from the Site to the Fraser Drain, pursuant to the following limitations: the maximum rate of discharge of treated effluent from the *Effluent Holding Ponds* , as referenced in ECA 2592-B83KSN, to the Fraser Drain must not exceed 20 litres per second; and, the discharge event must not exceed a three week period.

Item No. 2 **Compliance Date** 2019/08/16
(YYYY/MM/DD)

While conducting the discharge described in Work Item No. 1 of this Order, collect samples twice per week from the following sampling locations: SW1 (downstream of the confluence of Fraser Drain and Moose Creek); SW2 (immediate downstream location); SW3 (background location of Fraser Drain); SWMC1 (background location of Moose Creek); and, the effluent outfall location, all locations as referenced in previous monitoring reports prepared for the Site.

Item No. 3 **Compliance Date** 2019/08/16
(YYYY/MM/DD)

Samples collected under Work Item No. 2 of this Order must be submitted to an accredited laboratory for analysis of the parameters listed in Table 3 of ECA 2592-B83KSN and Hardness.

Item No. 4 **Compliance Date** 2019/08/16 (YYYY/MM/DD)

During each sampling event described in Work Item No. 2 of this Order, collect and record field measurements for temperature and pH for each sampling location.

Item No. 5 **Compliance Date** 2019/08/16 (YYYY/MM/DD)

While conducting the discharge described in Work Item No. 1 of this Order, collect samples from the effluent outfall and SW1 locations once per week, on a day when samples are collected under Work Item No. 2, and submit those samples for Acute Toxicity Testing on Rainbow Trout and *Daphnia magna* , following the procedures described in Condition 7.(5) of ECA 2592-B83KSN

Item No. 6 **Compliance Date** 2019/08/16 (YYYY/MM/DD)

While conducting the discharge described in Work Item No. 1 of this Order , submit forthwith to the undersigned, as received, all certificates of analysis and additional results for all sampling and analyses conducted under Work Item No. 2, Work Item No. 3, Work Item No. 4 and Work Item No. 5 of this Order.

Item No. 7 **Compliance Date** 2019/08/31 (YYYY/MM/DD)

Within three weeks of commencement of the discharge described in Work Item No. 1 of this Order, submit to the undersigned for review a contingency plan that describes the short-term actions that will be implemented to reduce and / or prevent further discharges of treated leachate from the Site of a quality which may impair the Fraser Drain and / or the Moose Creek. The short-term contingency plan must include an implementation schedule demonstrating that those contingency measures identified in the plan can be implemented within two weeks of notification from the Ministry, and must address the comments and concerns identified in correspondence provided by Lauren Forrester, dated June 24, 2019, and included as *Appendix A: Technical Support Memo* to the attached Provincial Officer's Report.

Item No. 8 **Compliance Date** 2019/08/16 (YYYY/MM/DD)

Provide written notification to the undersigned identifying the intended time and date of commencement of the discharge described in Work Item No. 1, prior to commencement of that discharge.

A. While this Order is in effect, a copy or copies of this order shall be posted in a conspicuous place.

B. While this Order is in effect, report in writing, to the District or Area office, any significant changes of operation, emission, ownership, tenancy or other legal status of the facility or operation.

C. Unless otherwise specified, all requirements of this Order are effective upon service of this Order.

This Order is being issued for the reasons set out in the annexed Provincial Officers Report which forms part of this Order.

Issued at Cornwall this day of , .

Badge No:

Tel:

Appendix C

Second Draft Provincial Officer's Order re. Discharge, October 11, 2019

Greg rL

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

Provincial Officer's Order

DRAFT

Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA)
Ontario Water Resources Act, R.S.O. 1990, c. O.40 (OWRA)
Pesticides Act, R.S.O. 1990, c. P.11 (PA)
Safe Drinking Water Act, 2002, S.O. 2002, c.32 (SDWA)
Nutrient Management Act, 2002, S.O. 2002, c.4 (NMA)

Order Number
0157-BGRN6S

Incident Report No.
2761-BATN2D

To: GFL Environmental Inc.
Suite 500 - 100 New Park Pl
Vaughan, Ontario, L4K 0H9
Canada

GFL Environmental Inc.
17125 Lafleche Rd
Moose Creek, Ontario, K0C 1W0
Canada

Site: 17125 Laflèche Rd
North Stormont, United Counties of Stormont Dundas and Glengarry

Pursuant to my authority under OWRA Section 16.1, OWRA Section 16 and EPA Section 157.1, I order you jointly and severally to do the following:

Work Ordered

Item No. 1 **Compliance Date** 2019/10/31 (YYYY/MM/DD)

Commencing as soon as practicable and discontinuing no later than October 31, 2019, conduct a discharge of treated effluent from the onsite *Effluent Holding Ponds* , as referenced in ECA 2592-B83KSN, to the Fraser Drain, at a rate that must not exceed 10 litres per second.

Item No. 2 **Compliance Date** 2019/10/31 (YYYY/MM/DD)

While conducting the discharge described in Work Item No. 1 of this Order, complete all of the actions described within the numbered paragraphs, 1 to 6 inclusive, listed on pages 2 and 3 in the Memorandum, *Response to GFL October 2019 Effluent Discharge Proposal* , prepared by Ministry Eastern Region Surface Water Specialist Lauren Forrester, dated October 4, 2019, and attached to this Order as *Appendix A: October 4, 2019 Memo* .

Item No. 3 **Compliance Date** 2019/10/31 (YYYY/MM/DD)

While conducting the discharge described in Work Item No. 1 of this Order and in addition to completing the actions described in Work Item No. 2 of this Order, collect photographs of the respective receiver (Fraser Drain, Moose Creek) at SW1, SW2, SW3 and SWMC1 sampling locations at the time of each sampling event, for the purposes of photo-documenting surface water flow conditions at the time of sample collection..

Item No. 4 **Compliance Date** 2019/10/31 (YYYY/MM/DD)

Samples collected under Work Item No. 2 of this Order must be submitted to an accredited laboratory for analysis of ECA 2592-B83KSN Table 3 parameters and Hardness.

Item No. 5 **Compliance Date** 2019/11/29 (YYYY/MM/DD)

By no later than November 29, 2019, submit to the undersigned a summary report prepared by a qualified person with expertise in surface water studies which evaluates and interprets the effects of the discharge on the receiver, based on all the data collected while completing Work Items No 1 to 4, inclusive, of this Order. All raw data pertinent to and collected while completing Work Items No. 1 to 4, inclusive, of this Order, including but not limited to, field data, effluent transfer records, start and stop dates and times for discharges, photographs, analytical reports, flow data, sample collection details, source of discharge and any other ancillary information, must be appended to the summary report.

Item No. 6 **Compliance Date** 2020/01/31 (YYYY/MM/DD)

By no later than January 31, 2020, submit to the undersigned a contingency plan which includes short-term measures that will be implemented for the seasonal periods of spring to fall 2020, or as deemed necessary by the Ministry, to reduce and / or prevent treated effluent discharges that have potential to cause impairment to the receiver, as identified in the Memorandum, *2018 Annual Monitoring Report GFL- Eastern Ontario Waste Handling Facility* , prepared by Ministry Eastern Region Surface Water Specialist Lauren Forrester, dated June 24, 2019, and attached to this Order as *Appendix B: June 24, 2019 Memo* .

Item No. 7 **Compliance Date** 2020/01/31 (YYYY/MM/DD)

By no later than January 31, 2020, submit to the undersigned the preliminary details of the upgrades and/or modifications being considered for the onsite leachate treatment facility, required to comply with Condition 36.4 of ECA A420018 issued to GFL Environmental Inc. on July 18, 2019.

A. While this Order is in effect, a copy or copies of this order shall be posted in a conspicuous place.

B. While this Order is in effect, report in writing, to the District or Area office, any significant changes of operation, emission, ownership, tenancy or other legal status of the facility or operation.

C. Unless otherwise specified, all requirements of this Order are effective upon service of

this Order.

This Order is being issued for the reasons set out in the annexed Provincial Officers Report which forms part of this Order.

Issued at this day of , .

Badge No:

Tel:

REQUEST FOR REVIEW

You may request that this Order be reviewed by a Director.

Your request must be made (i) in writing (or if made orally, with written confirmation) and (ii) served on the Director at the address below within seven (7) calendar days after being served with a copy of this Order.

In the written request or written confirmation of an oral request, you must include:

(a) the portions of the Order in respect of which the review is requested;
(b) any submissions that you wish the Director to consider; and
(c) an address for service to be used by the Director.

In response to your request for review, the Director may confirm, alter or revoke this Order and will serve you with a copy of the Director's decision or Order.

A request for review does not automatically stay this Order. If you wish to have the Director stay the Order you must also include this in your request and the Order is not stayed unless the Director makes an order granting a stay.

DEEMED CONFIRMATION OF THIS ORDER

If you do not receive oral or written notice of the Director's decision on your request for review within (7) calendar days of receipt of your request, and the Director has not stayed the Order, this Order shall be deemed to be confirmed by order of the Director and deemed to be served upon you.

In the case of a deemed confirmation, you may require a hearing before the Environmental Review Tribunal (Tribunal), if, within fifteen (15) calendar days from the deemed date of service of the Director's order, you serve written notice of your appeal on the Tribunal and the Director. Your notice must state:

(a) the portion(s) of the Order in respect of which the hearing is required; and
(b) the grounds on which you intend to rely at the hearing.

Except with leave of the Tribunal, you are not entitled to appeal a portion of the Order or to rely on a ground that is not stated in the notice requiring the hearing. Unless stayed by the Tribunal, the Order remains in effect from the date of service.

Written notice requiring a hearing can be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

and

Director
Ministry of the Environment, Conservation and Parks

Further information on the Tribunal and requirements for an appeal can be obtained directly from the Tribunal by:

Tel: (416) 212-6349 or 1(866) 448-2248
TTY 1-800-855-1155 via Bell Relay

Fax: (416) 326-5370 or 1(844) 213-3474
Web: www.ert.gov.on.ca

FOR YOUR INFORMATION

The following is for your information:

Service of the documentation referred to above can be made personally, by mail, by fax, by commercial courier or by email in accordance with the legislation under which the Order is made and any corresponding Service Regulation . Further information can be obtained from e- Laws at www.e-laws.gov.on.ca. Please note that choosing service by mail does not extend any of the above mentioned timelines.

Unless stayed, this Order is effective from the date of service. Non-compliance with the requirements of this Order constitutes an offence.

The requirements of this Order are minimum requirements only and do not relieve you from complying with the following:

(a) any applicable federal legislation,
(b) any applicable provincial legislation or requirements that are not addressed in this Order, and
(c) any applicable municipal law.

The requirements of this Order are severable. If any requirement of this Order or the application of any requirement to any circumstances is held invalid, the application of such requirement to other circumstances and the remainder of the Order are not affected.

Further orders may be issued in accordance with the legislation as circumstances require.

The procedures and other information provided above are intended as a guide. The legislation and/or regulations should be consulted for additional details and accurate reference.

Appendix D

Comments from MECP on GFL's Effluent Discharge Proposal, October, 2019

Ministry of the Environment, Conservation and Parks
Eastern Region
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Kingston ON K7P 3J6
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or 1.800.267.0974

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Région de l'Est
1259, rue Gardiners, unité 3
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Ontario

M E M O R A N D U M

October 4, 2019

TO: Terri Forrester
Senior Environmental Officer
Cornwall Area Office
Eastern Region

FROM: Lauren Forrester
Surface Water Specialist
Technical Support Section
Eastern Region

RE: Response to GFL October 2019 Effluent Discharge Proposal
GFL – Eastern Ontario Waste Handling Facility
17125 Lafleche Road, North Stormont, United Counties of SD&G
ECA No. A420018 and 2592-B83KSN

As requested, I have reviewed the following submissions from Green for Life (GFL):

1. Results for sampling carried out August 23, 27, 30, September 3, 6, and 10, 2019, during emergency discharge event August 21 to September 12, 2019.

2. Flow data for Fraser Drain and Moose Creek, received up to September 12, 2019.

I have also referenced the emails dated August 18 and August 22, 2019 from Mr. Greg van Loenen (GFL) to Terri Forrester (MECP) with the attachments '*Recommended Plan for Addressing Treated Effluent Discharge for GFL's Eastern Ontario Waste Handling Facility (EOWHF) for 2019'* (and associated appendices), '*Response to Draft POO – Effluent Discharge*' and '*Recommended Plan for Addressing Treated Effluent Discharge for GFL's Eastern Ontario Waste Handling Facility (EOWHF) for 2019'*. This memorandum is not intended to provide review of those documents, nor is it intended to imply acceptance of their content.

I offer the following comments relative to surface water matters associated with the proposed 10 L/s discharge of treated effluent to the Fraser Drain through the month of October.

Discussion and Recommendations

Monitoring data obtained during the Aug. 21 to Sept. 12, 2019 discharge event confirmed that the discharge of typical strength effluent at 20 L/s resulted in significant water quality impacts to the Fraser Drain. Limited attenuation occurred downstream in Moose Creek. Interpretation of the submitted data is complicated by discontinuous discharge in the day(s) preceding collection of samples on some days, lack of record of

time of sample collection relative to breaks in discharge, and discharge of unusually dilute effluent on some occasions.

Short term discharge solution:

In the short-term, I support the request for discharge of treated effluent at a constant, low rate through to October 31, 2019. This is considered to be an emergency measure to prevent uncontrolled overflow of effluent and leachate storage ponds and to limit mounding leachate within the waste. This also reflects the expectation that flow conditions in the receiving watercourses will be improved relative late summer, reducing the likelihood of negative impacts.

The following relates to the proposed discharge of treated effluent at a rate of 10 L/s to the Fraser Drain through to October 31, 2019:

1. Effluent may be discharged at 10 L/s to the Fraser Drain via the existing crib ditch.

2. Pre-discharge confirmatory sampling of any effluent to be discharged must be completed (composite sample at surface, ½ depth and bottom of the pond to be discharged) and results confirming compliance with ECA effluent limits must be received prior to commencing discharge. Samples must be analyzed for parameters listed in Table 3 of ECA No. 2592-B83KSN.

3. The Site owner must ensure that records of the following are maintained with respect to treated effluent discharged to the Fraser Drain:

    - Source of influent being treated at the leachate treatment facility (LTF);
    - Date, time, approximate volume, source and destination of effluent transferred between ponds; and
    - Date and time of any start or stop of effluent discharge.

4. Samples from stations SW2, SW1, SWMC1, and SW3 and from effluent shall be collected twice during each batch discharge. Samples must be analyzed for parameters listed in Table 3 of ECA No. 2592-B83KSN. Temperature and pH measured in the field at the time of sampling using a properly calibrated instrument.

    Sampling must be completed in a manner that ensures samples are representative of conditions in the drain, creek, or effluent during continuous discharge (i.e. if emptying of the effluent holding pond being discharged takes 8-10 days, samples should be collected on day 3 and day 7 of effluent discharge from that pond, not less than 48 hours after any break or pause in discharge). The date and time of each sample, name of individual collecting samples, and relevant meteorological conditions must be recorded at the time of sampling. Any changes in discharge rate must also be documented and reported.

5. Effluent toxicity testing shall continue to be completed in accordance with Condition 7(4) of ECA No. 2592-B83KSN (from every fourth batch discharge).

Flow measures during 2nd sample set collection for each pond.

6. Flow monitoring should be completed at least once during batch discharge and should correspond with the second sampling event for the discharge from that pond.

Discharge of treated effluent at 10 L/s will permit the release of up to 864 m^3/day of effluent from the facility. This is slightly greater than the rated capacity of the LTF (833 m^3/day). It is my understanding that at the time of writing of this memorandum, one effluent holding pond is empty and effluent may be directed to that pond from the LTF while the other is being discharged. Given this, there would be little benefit to permitting discharge at greater than 10 L/s.

Long-term discharge solution:

Please note that, while the Ministry is not opposed in principle to GFL's suggested long term effluent discharge plan of constant discharge at a reduced rate, there remains a need to adequately support the proposal through appropriate assessment, modelling, and data. As Fraser Drain sustains little to no flow at some times of year, I am not convinced that the impacts observed during those times will be mitigated by a lower rate of discharge alone. The potential need for improved treatment, streamflow-rated effluent discharge, and/or storage of effluent under low flow conditions cannot be ruled out at this time.

If you have any questions about these comments, I would be happy to discuss them with you.

Lauren Forrester, M.Sc.
LF

ec: Peter Taylor, Technical Support Section Manager
Victor Castro, Water Resources Unit Supervisor (acting)
Michael Seguin, Cornwall Area Office Supervisor

c: File SW ST NS 03 06 C10 – Eastern Ontario Waste Handling Facility
LF/IDS No. 4026-BFXRFR

Appendix E

MECP Memo re. Review of Discharge Proposal and Recommendations for Effluent Discharge Limitation, March 27, 2020

Ministry of the Environment, Conservation and Parks
Eastern Region
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Ministère de l'Environnement, de la Protection de la nature et des Parcs
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Ontario

M E M O R A N D U M

March 27, 2020

TO: Terri Forrester
Senior Environmental Officer
Cornwall Area Office
Eastern Region

FROM: Lauren Forrester
Surface Water Specialist
Technical Support Section
Eastern Region

RE: GFL – Eastern Ontario Waste Handling Facility (EOWHF)
Contingency Plan; Effluent Discharge Monitoring Report
17125 Lafleche Road, North Stormont, United Counties of SD&G
ECAs No. A420018 (Waste Disposal Site); and
2592-B83KSN (Industrial Sewage Works)

As requested, I have reviewed the submitted Contingency Plan, prepared by GFL and dated February 28, 2020 and Effluent Discharge Monitoring Report, prepared by CanDetec Inc. and dated January 24, 2020. I offer the following comments in relation to surface water issues only.

Proposed Contingency Plan

Summary of proposal:

The submitted contingency plan was prepared by GFL and intended to take effect during the 2020 low flow period (May 15 to October 31). Comments and recommendations relating to proposals are provided throughout this memorandum. Key proposals within the contingency plan include:

- Discharge of effluent to be rated to streamflow. Three (3) three-phase pumps to be installed to permit discharge rate to be controlled to between 2 to 40 L/second during lower flow periods, while the existing pump will be used to permit discharge of up to 40 to 50 L/s under higher flow conditions.

- A minimum dilution ratio in the receiving watercourse of 4:1 (streamflow to effluent) is proposed, with a minimum flow requirement of 8 L/s. Below 8 L/s, discharge will cease. For clarity, the receiving stream is the Fraser Drain unless otherwise approved (through ECA amendment). It appears that GFL intends to use the preliminary rating curves (developed in 2019) to establish the discharge rates. Proposed dilution ratio / minimum flows and use of preliminary rating curves is discussed below.

- Where flow is inadequate for discharge (to the Fraser Drain), GFL proposes to store treated effluent on site and/or recirculate treated leachate to the landfill (to hydrate vegetation over closed cells) and compost biofilter. Please see discussion below.

- GFL proposes sampling and analysis as per the ECA and continuation of the 3-year surface water assessment program that includes 14 monitoring locations and sampling from downstream stations during discharge. Chronic toxicity sampling is also proposed during low-flow discharges (sampling location not specified). Specific locations are discussed below.

Streamflow:

The Fraser Drain is the approved receiver for effluent discharged from the EOWHF leachate treatment facility. The Drain is acknowledged to sustain little to no flow at some times of year (dry ditch receiver). Moose Creek (approximately 600 m downstream of the effluent discharge point) is also subject to low flows in the summer months.

Continuous level loggers were installed in August 2019 and were removed in November 2019. Recorded water levels were correlated to streamflow measurements to produce preliminary rating curves. Those preliminary rating curves were submitted as a part of the Effluent Discharge Report (comments below) and were based on a total of only 6 flow measurements collected between Sept. 4 and Nov. 6, 2019. Development of stage versus discharge rating curves is proposed to be ongoing for 3 years. Calculations of streamflow using preliminary rating curves must be used with caution until such time that enough data is collected, and those calculations have been reviewed and accepted by the Ministry.

GFL references ‘significant flow’ present (in the Fraser Drain) in June and October, as well as during rainfall events. Data from level loggers have not been submitted for review, so I cannot confirm this statement. It is notable that instantaneous discharge measurements in the Fraser Drain and Moose Creek (Attachment C to the Contingency Plan) appear to confirm low or no flow periods in each of those months in 2019.

Dilution Ratio:

GFL proposes a minimum dilution ratio of 4:1 in the receiving stream, with no discharge when flow is less than 8 L/sec. The discharge rate proposed is between 2 and 50 L/sec. As noted above, the receiving stream is considered to be Fraser Drain unless otherwise approved (through ECA amendment).

Preliminary assessments by CanDetec (QP for the purpose of surface water evaluations) submitted to the Ministry, suggest a minimum dilution ratio of 5:1 is required to be protective of the aquatic environment (CanDetec, Jan. 24, 2020). Furthermore, results of chronic toxicity assays show toxic effects begin at 4.7:1 (not 3.7:1 reported by GFL). GFL’s proposal is inconsistent with that information.

While the CanDetec report references additional work to be undertaken in the development of a contingency plan (i.e. refine dilution ratios, evaluate site-specific water

quality guidelines), that additional information does not appear to have been included in the submission. As such, I cannot comment on whether GFL's proposed dilution ratio of 4:1 is supported by the opinion of a QP or will be protective of the aquatic environment.

GFL cites the flow rate and results of acute and chronic toxicity samples from September 11, 2019 to support the proposed dilution ratio. GFL reports a flow rate in Moose Creek of 56.5 L/sec at SW1 (downstream monitoring location, including 20 L/sec effluent), which equates to a dilution ratio of 1.8:1 (reported as 2.8:1 by GFL), the basis for the flow estimate is not specified (i.e. water level at the time of sample collection, duration of stage, meteorological conditions, equation used to calculate streamflow (linear or exponential)). Given that no instantaneous flow measurements are included in Attachment C for that date, it is presumed that this is a calculated flow. It is important to note that these preliminary rating curves have been established based on a limited number of data points and must be interpreted with caution, particularly at low flow.

As it is described, GFL's proposed Contingency Plan is unlikely to provide substantial capacity for discharge of treated effluent during low flow periods. The Plan is likely leave GFL with an excess of effluent and limited storage capacity in the late summer (when the receiver typically has little to no flow and limited capacity to assimilate effluent). Poor effluent quality (re: nitrate, chloride, boron) is likely to continue to be a limiting factor in GFL's ability to manage treatment effluent.

Effluent storage / recirculation:

GFL's proposal for recirculation of treated effluent onto the landfill and/or compost biofilter should be reviewed by the MECP engineers and hydrogeologists. While I defer to the opinion of subject matter experts, it is my understanding that recirculation is not considered an acceptable practice.

If recirculation is entertained as an option, consideration should be given to the potential impact of repeated application of salt-laden water on survival of vegetation (e.g. salination of soil), potential for increased leachate generation/strength, and ultimate receiver for runoff from proposed land application areas (i.e. is runoff during storm events expected to be captured by stormwater or leachate collection system).

With respect to the potential for on-site storage of effluent, GFL estimates existing storage as being equivalent to 39 days worth of treated effluent. The estimate includes reference to the North Leachate Holding Pond (NLHP) as being near capacity with 'accumulated precipitation'. GFL has previously indicated that the NLHP received raw leachate in 2019. As has previously been recommended, a plan to restore the intended contingency storage capacity of the NLHP is needed.

Effluent Discharge Report

Effluent was discharged to the Fraser Drain at 10 L/sec from October 11 through 31, 2019. This is a reduced rate relative to the typical discharge rate of 50 L/sec. The Effluent Discharge Report provides an interpretation of the effects of discharge over that period. Based on independent review, I note the following:

- Effluent was discharged continuously from Oct. 11 (afternoon) through to Oct. 31 (morning) (21 days). As such, effects on receiving water courses should be compared primarily to long-term exposure guidelines.

- Effluent nitrate concentration exceeded the Canadian Water Quality Guideline (CWQG) short term exposure guideline in all samples (n=6) and ranged from 173 to 287 mg/L. Chloride also exceeded the CWQG short term exposure guideline in effluent samples collected October 15 to 22 (n=3) and ranged from 491 to 784 mg/L. Boron in effluent ranged from 2.88 to 4.94 mg/L, consistently exceeding the CWQG of 1.5 mg/L (long term exposure). Other minor guideline exceedances in effluent include chromium and phosphorus. TSS slightly exceeded the ECA limit on occasion, but otherwise effluent met ECA limits. The consultant attributes the slightly elevated TSS to the discharge channel. Hardness and sodium concentrations were high (ranging from 510 to 635 mg/L as $CaCO_3$ for hardness and 463 to 826 mg/L for sodium). Sulphate ranged from 331 to 418 mg/L.

- Stream flow in the Fraser Drain (SW2 / FDSW2) was variable; estimated / measured to range between 7 L/sec to 98 L/sec, which is understood to include 10 L/sec effluent discharge (measured flow Oct. 18, 25, 31; estimated flows on Oct 15, 22, and 29). At SW2, nitrate-N exceeded the short term CWQG in two of six sampling dates (lowest flow days) and consistently exceeded the long-term exposure guideline, by a factor of 8- to 85-times, ranging from 23 to 255 mg/L. Chloride exceeded the long-term exposure guideline on all but two dates (corresponding to highest flows) (107 to 689 mg/L) and exceeded the short-term exposure guideline in one sample (Oct. 15). Boron exceeded the long-term exposure guideline at SW2 in two of six samples (Oct. 15 and 22) (0.45 to 4.66 mg/L). Sulphate ranged from 141 to 372 mg/L, hardness ranged from 339 to 653 mg/L and sodium ranged from 102 to 785 mg/L.

  With the exception of iron and phosphorus, guideline exceedances were driven by effluent (note: nitrate is occasionally elevated at the upstream location, but markedly less so than downstream of effluent discharge).

- In Moose Creek at SW1 water quality was improved relative to SW2 and short term exposure guidelines were not exceeded. Nitrate continued to exceed the long-term exposure guideline (11 - 58.9 mg/L NO3-N), while chloride ranged from 39.9 to 246 mg/L, exceeding the CQWG in only one sample. Boron ranged from 0.125-1.61 mg/L, and sulphate (102-154 mg/L).

The Effluent Discharge Monitoring Report prepared by CanDetec and dated January 24, 2020 outlines the following findings:

- CanDetec recommends minimum dilution ratio of 5:1 and a minimum flow of 60 L/sec in Moose Creek, below which discharge would cease.

  Fraser Drain is described by CanDetec as lacking assimilative capacity (during the summer and early fall). This is consistent with the Ministry's understanding that the Fraser Drain is seasonally dry.

- The hardness of both the receiving watercourse and of effluent may confer toxicity modifying effects (re: nitrate and chloride); however, further assessment is required for development of site-specific guidelines.

- Some water quality parameters (TP, Fe, NO3-N) are elevated either consistently or occasionally in receiving watercourses. The receivers should be considered Policy 2 in relation to these parameters (as described in my April 25, 2019 memo). Where a receiving watercourse is identified as Policy 2 for a parameter, no further deterioration of water quality may be permitted with respect to that parameter, except under specific conditions.

  With the exception of nitrate, occasional exceedances of guidelines at downstream sampling locations may be attributed to upstream water quality. Nitrate concentrations at downstream locations are more strongly affected by effluent. Actions are needed to manage the concentration of nitrate in effluent.

- CanDetec compares the results of effluent discharge to long-term exposure guidelines in recognition of the length of discharge (which is reported as 17 days, not 21 as indicated in Table 1). Long-term guidelines are appropriate and should form the basis of future assessments.

  Irrespective of the duration of discharge, both long-term and short-term exposure guidelines are exceeded in effluent and receiving watercourses (as outlined above).

- Samples collected Sept. 10 (reported as Sept. 11) were not acutely toxic. Water quality data was previously submitted to the Ministry and effluent parameters were generally within the typical range for this facility.

  Chronic toxicity tests revealed no inhibitory or toxic effects in a Sept. 10 sample from SW1 (at that time, discharge was 20L/sec). Streamflow estimate were not provided by CanDetec, although GFL provides an estimate of 56.5 L/sec in the contingency plan. The reason for the inconsistency is unclear.

  The results above should be taken in consideration with previous effluent analysis (June 2019), which demonstrated effluent from the EOWHF LTF (undiluted) caused 100% inhibition of reproduction for *Ceriodaphnia dubia.* The IC25 for that sample was found to be 21.3%. Water quality data provided (collected two days after tox samples) contain a relatively low concentrations of chloride and nitrate compared to typical effluent (496 mg/L Chloride in sample, compared to a 25th percentile concentration of 652 mg/L and average of 796 mg/L in effluent data for 2015-2018; and 209 mg/L nitrate-N in sample, compared to 25th percentile concentration of 211 mg/L and average of 253 mg/L in effluent data for 2015-2018). This highlights the need for more comprehensive evaluation.

- Flow measurements were completed six times since installation of the continuous level loggers in August 2019. Continuous level loggers were removed on November 19, 2019 and preliminary Rating Curves were developed. These curves are expected to be refined as additional information becomes available (as indicated by CanDetec). A power function used to estimate flows at SW1 and SW2 (SWFD2) whereas linear function was found to be best fit at SWFD3.

- CanDetec cites estimated flows on October 15 (7 L/sec at SW2) as compared to 17 L/sec at SWFD3 (upstream) as support for GFL's claim that the watercourse is a losing reach (infiltration to groundwater). The estimated flow rate of 7 L/sec at SW2 includes ongoing effluent discharge at 10 L/sec only 50 m upstream. A groundwater reviewer should be consulted on the plausibility groundwater infiltration in this area.

  Caution should be used when interpreting flow estimates for preliminary rating curves, particularly at low flow. As above, the continued uncertainty highlights the need for more comprehensive assessment to support a long-term discharge plan.

- The reduced discharge rate (10 L/sec) resulted in concentration of nitrate at SW1 that, in the opinion of the consultant, were unlikely to cause long term impact to the receiving aquatic environment, despite being consistently elevated above the long-term exposure guideline (CWQG), as the Upper 95% limit for that guideline was generally not interpreted to be exceeded. This interpretation is based on continued confusion of the appropriate guideline value (NO3- versus NO3-N).

  The Upper 95% limit for the CWQG cited by CanDetec is 24 mg/L. As described in the CCME factsheet, that value represents the concentration as the ion (NO_3^-). Expressed as nitrogen (NO_3-N) for comparison to the GFL data, the Upper 95% limit is to 5.42 mg/L. Based on this correction, the concentration of nitrate at SW1 consistently exceeds the 95% confidence limit for the CWQG, even at high flows, by a factor of 2- to 11-times. Given this, I cannot agree with the basis of the opinion provided. Impacts to the aquatic environment cannot be ruled out.

- Additional information reflecting the toxicity modifying effect of hardness was expected to be included as a component of the contingency plan. As noted above, no additional supporting information is provided.

  Routine exceedance of published toxicological data cannot be supported by the Ministry without studies to demonstrate that impairment will not occur. Development of site-specific guidelines for those parameters (by a qualified aquatic toxicologist) would be required to support such a request.

Based on the submitted information, when sufficient flows are present in the receiving watercourses, discharge at a reduced rate may allow for adequate dilution in the receiver to be protective of the aquatic ecosystem. As has been previously stated, over-reliance on dilution to mitigate impacts of effluent parameters (e.g. nitrate, chloride, boron) is not the Ministry's preferred solution and is unlikely to be a sustainable solution to effluent discharge during low flow periods in these receivers. GFL has yet to provide comprehensive assessment to support a long-term discharge solution.

Conclusions and Recommendations

The Contingency plan prepared and submitted by GFL fails to provide a reliable, science-based solution to the management of treated effluent during low flow periods. It is likely to result in an excess of effluent and limited storage in the late summer. The Plan is incomplete (locations, frequencies not specified) and, in some components, inconsistent with the recommendations and opinions provided by their consultant.

Poor effluent quality (re: nitrate, chloride, boron) is likely to continue to be a limiting factor in GFL's ability to manage treatment effluent.

In order to ensure some level of operational capacity for GFL through the low flow period of 2020 while ensuring some degree of protection of the aquatic environment, I recommend the following be implemented as an interim measure only:

- Until such time that site-specific water quality criteria are developed and accepted by the Ministry, a minimum dilution ratio of 5:1 (stream flow to effluent) should be maintained during the low flow period (May 15 - Oct. 31). Effluent discharge shall continue to be to the Fraser Drain.

  No discharge of treated effluent should be permitted where streamflow in Moose Creek (without influence of effluent) is less than 60 L/sec.

  Streamflow should be calculated based on 12-hour running average water level in Moose Creek (measured by continuous level loggers). If continuous level loggers are not equipped with real-time data transmission, water level must be measured at least twice daily during discharge using a staff gauge (staff gauges must be co-located with level loggers, installed and surveyed into place by a QP).

  Given the 'preliminary' status of the rating curves for the receiving watercourses, calculation of streamflow must be carried out using the most accurate method available (as per the opinion of a QP). Instantaneous stream discharge measurement should continue at least twice monthly to support development of stage versus discharge rating curves.

  Documentation to be maintained during discharge must include, but is not necessarily limited to:

  - Source of effluent, time of start and end of discharge, time of effluent sample collection, and rate of effluent discharge.
  - Date and time of water quality sampling in receiving waters, name of person collecting samples and water level at the time of sampling either from staff gauge or level logger.
  - Calculated and/or measured streamflow at the time of sample collection and data used to calculate streamflow where applicable (i.e. water level at the time of sample collection, rating curve used to determine streamflow).

- Receiving water monitoring should be undertaken as proposed by GFL (as mandated in the site's ECAs, with recommended supplemental sampling / parameters, and as proposed in the 3-year surface water assessment program).

  For clarity, regular monitoring locations are SW3 (aka SWFD3), SW4 (aka SWFD4), SWMC1, SWMC2, SWT1 and SW2_3A (background), and SW2 (aka SWFD2), SW1 (downstream). I have also recommended an additional monitoring location be established downstream of SW1 to evaluate attenuation of effluent parameters with distance.

In my April 2019 memorandum, I recommended cessation of sampling at SWP3, SWND3, SWID1, SWD2 as these stations were either redundant or consistently dry. It is unclear if those stations are included in GFL's count of stations to be monitored. Clarification should be provided.

- During discharge, samples must be collected from background stations SW3 and SWMC1, and from downstream stations SW2, SW1 and the newly established station downstream of SW1. Chronic toxicity samples (proposed by GFL) should be collected from SW1, SW2 and effluent during discharge at low flows, which GFL describes as 8-40 L/s (in the Fraser Drain). Toxicity sampling must correspond to water quality sampling. GFL must ensure that all samples collected 'during discharge' are collected in a manner that captures representative conditions in the receiver during that discharge event.

- MECP Engineers and Hydrogeologist should be consulted with respect to the proposal for application of treated effluent to closed landfill sections and the compost biofilter. It is my understanding that recirculation of landfill effluent is no longer considered an acceptable practice, as noted above.

- GFL should prepare an action plan for management of the contents of the North Leachate Holding Pond (NLHP) in order to restore the contingency storage capacity of that pond (which I understand to contain leachate combined with precipitation, not only precipitation as stated by GFL). This is particularly relevant given the limited capacity of the receiving water courses to assimilate effluent during the low flow season.

If you have any questions about these comments, I would be happy to discuss them with you.

Lauren Forrester, M.Sc.
LF

ec: Michael Seguin, Cornwall Area Supervisor
Victor Castro, Water Resources Unit Supervisor
James Mahoney, Technical Support Section Manager
Peter Taylor, Eastern Region Director
Robert Holland, Regional Hydrogeologist
Candice McKay, Senior Environmental Officer

c: File SW ST NS 03 06 C10 – Eastern Ontario Waste Handling Facility
File SW 13 06 07 02 MO – Moose Creek, South Nation River Basin
LF/IDS 1268-BMBHD3 / 7414-BLWHVR

Appendix F

Surface Water Data Summaries for Fraser Drain, Moose Creek, Albert Fahey Award Drain and Upper-Tayside Drain for Period of Record for all Water Quality Parameters

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW1

LAB ID:	1088444	1104046	1127822	1147922	1160833	1173924	1198007
Date Sampled:	2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:	4242	6137	1894	539	2606	2836	1786

PARAMETER	PWQO	MRL							
Alkalinity as CaCO3		5	217	192	201	252	208	195	223
Al (dissolved)	0.075*	0.01	0.01	0.05	0.01	0.02	0.03	0.04	0.12
Aluminium		0.01	0.43	0.54	1.04	0.40	0.51	0.69	1.03
Arsenic	0.1	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001
Barium		0.01	0.05	0.05	0.05	0.06	0.05	0.05	0.05
Biochemical Oxygen Demand		1	5	2	1	<1	1	<1	3
Boron	0.2*	0.01	0.12	0.06	0.07	0.07	0.06	0.05	0.11
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	77	74	77	104	79	85	71
Chemical Oxygen Demand		5	34	28	36	29	32	40	41
Chloride		1	29	15	17	33	17	16	23
Chromium (total)	0.0089**	0.001	0.001	<0.001	0.002	<0.001	<0.001	0.002	0.003
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	4	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0005	0.0003	0.0007	0.0003	0.0003	0.0005	0.0009
Conductivity (µS/cm)		5	590	461	544	696	521	534	524
Copper	0.005	0.001	0.002	0.002	0.003	0.002	0.002	0.002	0.003
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	246	230	246	334	255	270	235
HCO3 as CaCO3		1	217	192	197	252	208	195	223
Fe (dissolved)		0.03	0.08	0.09	0.04	0.04	0.06	0.07	0.11
Iron	0.3	0.03	0.60	0.50	1.00	0.48	0.62	0.77	1.33
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	13	11	13	18	14	14	14
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	2.94	0.38	0.72	0.18	0.54	0.12	0.10
NH3 (un-ionized Ammonia[a])	0.02		0.0156	0.0095	0.0110	0.0011	0.0032	0.0053	0.0012
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.21	1.50	1.28	2.18	0.84	3.34	0.23
pH (pH units)	6.5-8.5		8.07	8.11	8.30	8.09	8.09	8.16	8.11
Phenols	0.001	0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002
Potassium		1	4	3	6	4	3	3	5
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	30	16	22	30	22	14	30
Sulphate		1	38	30	52	62	37	45	26
TDS (COND - CALC)		1	384	300	354	452	339	347	341
Total Kjeldahl Nitrogen		0.1	3.48	1.35	2.05	0.85	1.12	0.69	0.78
Total Phosphorus	0.03*	0.01	0.09	0.06	0.44	0.06	0.07	0.09	0.09
Total Suspended Solids		2	19	7	9	12	17	26	11
Vanadium	0.006*	0.001	0.002	0.002	0.003	0.001	0.001	0.002	0.004
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:									
Dissolved Oxygen			4.90	1.15	3.75	4.06	1.62	10.42	6.48
Temperature (ºC)		-100	0.7	17.3	16.2	0.6	0.0	17.4	16.3
pH (field) (pH units)	6.5-8.5		7.70	7.81	7.63	7.75	7.78	8.06	7.52
Conductivity (field) (µS/cm)			869	672	789	669	767	563	793
field notes					*8				*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW1

LAB ID:		1214679	1226553	1239647	1256595	1271507	1280585	1292323
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		133	8189	729	1917	5514	3688	5007
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	241	225	202	166	222	212	191
Al (dissolved)	0.075*	0.01	0.03	0.04	0.02	0.09	0.03	0.02	0.02
Aluminium		0.01	0.74	0.57	0.29	1.42	0.27	0.26	0.35
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium		0.01	0.07	0.05	0.04	0.07	0.06	0.05	0.04
Biochemical Oxygen Demand		1	1	<1	1	2	<1	1	1
Boron	0.2*	0.01	0.05	0.10	0.07	0.14	0.06	0.05	0.06
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	114	91	73	86	108	78	80
Chemical Oxygen Demand		5	35	35	51	59	36	30	46
Chloride		1	24	29	23	29	35	24	19
Chromium (total)	0.0089**	0.001	0.002	0.001	<0.001	0.002	<0.001	<0.001	0.001
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0004	0.0004	0.0003	0.0005	<0.0002	<0.0002	0.0003
Conductivity (µS/cm)		5	662	634	499	592	714	582	501
Copper	0.005	0.001	0.002	0.002	0.002	0.004	0.002	0.001	0.002
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	346	285	232	264	344	248	245
HCO3 as CaCO3		1	241	225	202	166	222	212	191
Fe (dissolved)		0.03	0.06	0.08	0.08	0.10	0.04	0.09	0.06
Iron	0.3	0.03	0.75	0.50	0.36	0.83	0.28	0.32	0.35
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	15	14	12	12	18	13	11
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.17	1.85	0.55	0.18	0.11	0.21	0.96
NH3 (un-ionized Ammonia[a])	0.02		0.0014	0.0057	0.0071	0.0034	0.0003	0.0013	0.0042
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	6.38	3.91	1.12	4.70	6.08	3.31	4.23
pH (pH units)	6.5-8.5		8.18	8.15	8.18	8.14	8.21	8.29	8.02
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Potassium		1	3	4	3	7	5	3	3
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	15	24	23	27	25	17	14
Sulphate		1	61	52	34	90	82	53	40
TDS (COND - CALC)		1	430	412	324	385	464	378	326
Total Kjeldahl Nitrogen		0.1	0.96	3.15	1.81	1.47	2.70	1.60	2.40
Total Phosphorus	0.03*	0.01	0.04	0.070	0.046	0.105	0.030	0.050	0.100
Total Suspended Solids		2	24	7	6	15	3	5	14
Vanadium	0.006*	0.001	0.002	0.001	0.001	0.004	<0.001	<0.001	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:									
Dissolved Oxygen			14.64	13.14	13.16	7.02	18.31	12.79	11.08
Temperature (ºC)		-100	2.6	0.4	8.6	19.8	0.6	0.1	6.1
pH (field) (pH units)	6.5-8.5		7.81	7.48	7.81	7.61	7.47	7.80	7.42
Conductivity (field) (µS/cm)			1010	696	548	642	754	600	349
field notes									

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW1

LAB ID:		1318901	1336945	1348866	1374010	1396813	14004453
Date Sampled:		9/6/2017	12/7/2017	3/13/2018	7/12/2018	11/1/2018	12/17/2018
Sample ID:							

PARAMETER	PWQO	MRL					
Alkalinity as CaCO3		5	211.000	191	423	212	203
Al (dissolved)	0.075*	0.01	0.11	0.16	0.1	<0.01	0.02
Aluminium		0.01	0.38	0.64	0.67	0.78	0.26
Arsenic	0.1	0.001	<0.001	<0.001	<0.005	<0.001	<0.001
Barium		0.01	0.05	0.05	0.15	0.07	0.06
Biochemical Oxygen Demand		1	1.0000	<1	5	7	2
Boron	0.2*	0.01	0	0.04	4.6	0.12	0.05
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Calcium		1	89	84	96	96	97
Chemical Oxygen Demand		5	51	27	190	38	21
Chloride		1	18	27	706	30	28
Chromium (total)	0.0089**	0.001	<0.001	<0.001	0.010	0.002	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	4	N/A-PH	10	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0002	0.0003	0.0060	0.0006	0.0003
Conductivity (µS/cm)		5	528	545	4410	765	621
Copper	0.005	0.001	0.002	0.001	<0.005	0.004	0.002
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	272	255	590	322	300
HCO3 as CaCO3		1	207	191	413	212	203
Fe (dissolved)		0.03	0.18	0.17	<0.2	0.03	0.04
Iron	0.3	0.03	0.47		0.5	0.76	0.33
Lead	0.025	0.001	<0.001	<0.001	<0.005	<0.001	<0.001
Magnesium		1	12	11	85	20	14
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	0.060	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.1	0.46	0.25	0.75	0.2
NH3 (un-ionized Ammonia[a])	0.02			0.0023	0.0086	0.0082	0.0007
N-NO2 (Nitrite)		0.1	<0.10	<0.10	0.360	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.4	2.88	96.7	1.89	5.2
pH (pH units)	6.5-8.5		8.32	8.08	8.41	7.97	8.03
Phenols	0.001	0.001	<0.001	<0.001	0.002	0.005	<0.001
Potassium		1	4	2	251	10	3
Selenium	0.1	0.001	<0.001	<0.001	<0.005	<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	19	19	672	37	17
Sulphate		1	35	34	698	131	71
TDS (COND - CALC)		1	343	354	3310	497	404
Total Kjeldahl Nitrogen		0.1	<0.8	2.5	8.13	2.2	0.8
Total Phosphorus	0.03*	0.01	0.1	0.07	0.14	0.058	0.058
Total Suspended Solids		2	25	17	37	<2	10
Vanadium	0.006*	0.001	0.002	0.001	0.010	0.002	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Field Data:							
Dissolved Oxygen				11.7	N/A	N/A	11.85
Temperature (ºC)		-100		2.3	25.0	4.7	0.4
pH (field) (pH units)	6.5-8.5			7.7	7.8	7.96	7.63
Conductivity (field) (µS/cm)				484	382	688	560
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2

LAB ID:		1088447	1104048	1127823	1147925		1173926	1198010
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:		6551	7628	3221	0740		5885	6640

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	283	214	224	287	202	248
Al (dissolved)	0.075*	0.01	0.01	0.05	0.02	0.03	0.05	0.07
Aluminium		0.01	0.53	0.44	0.94	2.00	1.19	0.76
Arsenic	0.1	0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.001
Barium		0.01	0.06	0.04	0.05	0.07	0.05	0.04
Biochemical Oxygen Demand		1	7	2	1	<1	3	3
Boron	0.2*	0.01	0.31	0.10	0.09	0.10	0.07	0.22
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	80	79	92	115	84	89
Chemical Oxygen Demand		5	34	40	43	34	52	48
Chloride		1	41	26	35	48	39	62
Chromium (total)	0.0089**	0.001	0.002	0.001	0.002	0.005	0.003	0.002
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	6	4	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0008	0.0003	0.0004	0.0010	0.0007	0.0006
Conductivity (µS/cm)		5	761	533	742	821	613	728
Copper	0.005	0.001	0.002	0.002	0.002	0.003	0.003	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	262	251	304	378	267	288
HCO3 as CaCO3		1	283	208	220	287	202	248
Fe (dissolved)		0.03	0.10	0.09	0.03	0.04	0.07	0.06
Iron	0.3	0.03	0.65	0.43	0.71	1.87	1.16	0.61
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	15	13	18	22	14	16
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	8.68	0.30	3.01	0.28	0.56	0.19
NH3 (un-ionized Ammonia[a])	0.02		0.0604	0.0441	0.0972	0.0004	0.0241	0.0024
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.09	0.93	1.09	1.34	2.95	0.34
pH (pH units)	6.5-8.5		8.07	8.45	8.32	7.93	8.10	8.12
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002
Potassium		1	8	4	17	6	6	8
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	51	26	32	40	29	57
Sulphate		1	44	38	103	75	46	49
TDS (COND - CALC)		1	495	346	482	534	398	473
Total Kjeldahl Nitrogen		0.1	8.85	1.40	4.32	0.97	2.17	1.05
Total Phosphorus	0.03*	0.01	0.09	0.14	1.64	0.13	0.33	0.20
Total Suspended Solids		2	16	8	9	33	52	6
Vanadium	0.006*	0.001	0.002	0.002	0.003	0.004	0.003	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			4.40	1.04	4.15	3.78	10.08	4.94
Temperature (ºC)		-100	0.4	21.3	18.4	0.2	18.1	17.7
pH (field) (pH units)	6.5-8.5		7.83	8.50	7.89	7.18	8.03	7.48
Conductivity (field) (µS/cm)			850	776	746	742	642	1100
field notes						*4		*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2

LAB ID:		1214682	1226556	1239649	1256598	1271510		1292325
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		5831	8938	4115	9427	4644		3652
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	258	237	234	162	210	187
Al (dissolved)	0.075*	0.01	0.05	0.04	0.02	0.10	0.06	0.02
Aluminium		0.01	0.77	0.55	0.42	2.18	0.32	0.54
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001
Barium		0.01	0.05	0.05	0.04	0.07	0.06	0.04
Biochemical Oxygen Demand		1	3	<1	4	2	<1	2
Boron	0.2*	0.01	0.16	0.17	0.16	0.25	0.07	0.11
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	109	86	75	81	108	82
Chemical Oxygen Demand		5	60	39	58	60	36	44
Chloride		1	45	43	42	64	49	25
Chromium (total)	0.0089**	0.001	0.002	0.001	0.001	0.004	<0.001	0.004
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0005	0.0005	0.0005	0.0007	<0.0002	0.0004
Conductivity (µS/cm)		5	796	711	610	746	763	541
Copper	0.005	0.001	0.002	0.002	0.002	0.005	0.002	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	350	281	245	256	344	258
HCO3 as CaCO3		1	258	237	234	162	210	187
Fe (dissolved)		0.03	0.07	0.10	0.08	0.08	0.05	0.07
Iron	0.3	0.03	0.65	0.52	0.46	1.06	0.24	0.45
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	19	16	14	13	18	13
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	2.21	4.10	2.01	0.14	0.17	2.33
NH3 (un-ionized Ammonia[a])	0.02		0.0236	0.0159	0.1586	0.0023	0.0017	0.0127
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	0.12	<0.10	<0.10
N-NO3 (Nitrate)		0.1	3.28	2.76	1.06	3.50	6.39	4.37
pH (pH units)	6.5-8.5		8.13	8.14	8.27	8.11	8.18	8.01
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004
Potassium		1	8	6	6	12	7	4
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	39	35	40	60	35	24
Sulphate		1	82	60	37	112	93	48
TDS (COND - CALC)		1	517	462	396	485	496	352
Total Kjeldahl Nitrogen		0.1	3.09	5.56	3.54	1.52	2.90	3.80
Total Phosphorus	0.03*	0.01	0.11	0.100	0.118	0.157	0.070	0.210
Total Suspended Solids		2	12	4	7	9	<2	21
Vanadium	0.006*	0.001	0.002	0.001	0.002	0.004	0.001	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			13.31	11.50	15.36	4.70	18.31	10.63
Temperature (ºC)		-100	2.2	-0.3	11.6	19.5	0.8	7.8
pH (field) (pH units)	6.5-8.5		7.95	7.60	8.52	7.57	7.98	7.46
Conductivity (field) (µS/cm)			1200	803	663	810	775	523
field notes							*4	

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2

LAB ID:		1318901	1292325	1292325	1292325	1396814	1404454
Date Sampled:		9/6/2017	5/10/2017	3/13/2018	7/12/2018	11/1/2018	12/17/2018
Sample ID:							

PARAMETER	PWQO	MRL					
Alkalinity as CaCO3		5	232		523	208	153
Al (dissolved)	0.075*	0.01	0.30		0.35	0.01	0.01
Aluminium		0.01	0.69		1.14	1.36	0.26
Arsenic	0.1	0.001	0.001		<0.005	0.001	<0.001
Barium		0.01	0.05		0.19	0.08	0.04
Biochemical Oxygen Demand		1	3		3	30	3
Boron	0.2*	0.01	0.10		6.90	0.15	0.08
Cadmium	0.0002	0.0001	<0.0001		<0.0005	<0.0001	<0.0001
Calcium		1	95		106	104	84
Chemical Oxygen Demand		5	87		251	85	32
Chloride		1	29		911	64	49
Chromium (total)	0.0089**	0.001	0.002		0.013	0.003	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	N/A-PH		12	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0004		0.0090	0.0008	0.0002
Conductivity (µS/cm)		5	600		6140	942	654
Copper	0.005	0.001	0.003		0.005	0.006	0.002
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	295		746	346	272
HCO3 as CaCO3		1	232		511	208	153
Fe (dissolved)		0.03	0.31		<0.2	0.04	0.05
Iron	0.3	0.03	0.59		<0.2	0.87	0.23
Lead	0.025	0.001	<0.001		<0.005	0.001	<0.001
Magnesium		1	14		117	21	15
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005		0.100	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.29		0.38	1.85	0.36
NH3 (un-ionized Ammonia[a])	0.02				0.0202	0.0172	0.1095
N-NO2 (Nitrite)		0.1	0.160		0.850	0.720	<0.10
N-NO3 (Nitrate)		0.1	1.30		152.00	0.21	3.88
pH (pH units)	6.5-8.5		8.26		8.41	7.83	7.76
Phenols	0.001	0.001	<0.001		0.003	0.013	<0.001
Potassium		1	8		392	18	7
Selenium	0.1	0.001	<0.001		<0.005	<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	25		1050	56	30
Sulphate		1	40		906	202	98
TDS (COND - CALC)		1	390		4910	612	425
Total Kjeldahl Nitrogen		0.1	2.30		11.90	3.80	1.50
Total Phosphorus	0.03*	0.01	0.46		0.22	0.14	0.38
Total Suspended Solids		2	12		24	33	9
Vanadium	0.006*	0.001	0.003		0.013	0.003	0.001
Zinc	0.02*	0.01	<0.01		0.05	0.01	<0.01
Field Data:							
Dissolved Oxygen				N/A	N/A	N/A	9.50
Temperature (ºC)		-100		N/A	30.8	4.9	0.4
pH (field) (pH units)	6.5-8.5			N/A	7.82	7.88	9.71
Conductivity (field) (µS/cm)				N/A	399	822	604
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW3

LAB ID:			1104054	1127826	1147928	1160829	1173933	1198013
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:			9160	8074	8376	7227	2067	5279
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	162	168	187	166	178	181
Al (dissolved)	0.075*	0.01	0.05	0.03	0.01	0.01	0.03	0.02
Aluminium		0.01	0.30	0.64	0.23	0.20	0.72	0.57
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.04	0.04	0.04	0.04	0.05	0.03
Biochemical Oxygen Demand		1	3	<1	<1	1	1	1
Boron	0.2*	0.01	0.03	0.03	0.02	0.01	0.02	0.05
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	67	73	86	79	81	76
Chemical Oxygen Demand		5	30	33	23	25	33	37
Chloride		1	14	21	23	16	28	42
Chromium (total)	0.0089**	0.001	<0.001	0.001	<0.001	0.005	0.002	0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	8	6	N/A-PH	N/A-PH	N/A-PH	5
Cobalt	0.0009	0.0002	0.0002	0.0003	<0.0002	<0.0002	0.0005	0.0003
Conductivity (µS/cm)		5	372	458	512	454	502	545
Copper	0.005	0.001	0.002	0.003	0.001	<0.001	0.002	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	200	223	260	238	243	239
HCO3 as CaCO3		1	154	161	187	166	178	176
Fe (dissolved)		0.03	0.19	0.06	0.04	0.07	0.08	<0.03
Iron	0.3	0.03	0.49	0.57	0.27	0.41	0.84	0.49
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	8	10	11	10	10	12
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.25	0.18	0.03	0.11	0.04	0.04
NH3 (un-ionized Ammonia[a])	0.02		0.09873763	0.0181	0.00040139	0.0014267	0.00208833	0.01488019
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.76	0.22	1.31	0.84	3.50	0.17
pH (pH units)	6.5-8.5		8.75	8.63	8.16	8.03	8.17	8.47
Phenols	0.001	0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002
Potassium		1	2	2	1	1	2	2
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	9	14	13	9	14	32
Sulphate		1	23	37	38	41	28	42
TDS (COND - CALC)		1	242	298	333	295	326	354
Total Kjeldahl Nitrogen		0.1	1.01	0.79	0.37	0.38	1.08	0.66
Total Phosphorus	0.03*	0.01	0.03	0.04	0.03	0.03	0.07	<0.05
Total Suspended Solids		2	11	7	10	5	25	11
Vanadium	0.006*	0.001	0.002	0.003	0.001	<0.001	0.003	0.003
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			2.15	6.67	4	1.85	11.15	9.98
Temperature (ºC)		-100	27.6	32.4	0.3	0.2	17.34	24.96
pH (field) (pH units)	6.5-8.5		8.85	7.98	8.12	8.11	8.14	8.96
Conductivity (field) (µS/cm)			528	665	784	640	533	792
field notes		*4		*8				*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
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EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW3

LAB ID:		1214688	1226559	1239655	1256603	1271513		1292329
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		1479	5469	8954	2702	9727		8733

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	186	160	157	147	171	132
Al (dissolved)	0.075*	0.01	0.03	0.03	0.03	0.02	0.02	0.03
Aluminium		0.01	0.44	0.28	0.17	0.11	0.22	0.21
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.05	0.04	0.03	0.06	0.06	0.04
Biochemical Oxygen Demand		1	<1	<1	1	1	2	<1
Boron	0.2*	0.01	0.02	0.02	0.02	0.03	<0.01	0.02
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	97	76	64	91	107	69
Chemical Oxygen Demand		5	33	33	50	45	20	31
Chloride		1	27	23	23	41	35	16
Chromium (total)	0.0089**	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH	6	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Conductivity (µS/cm)		5	557	479	408	590	623	396
Copper	0.005	0.001	0.002	0.001	0.002	0.002	0.001	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	288	227	193	268	317	201
HCO3 as CaCO3		1	186	160	151	147	171	132
Fe (dissolved)		0.03	0.08	0.12	0.11	0.05	0.04	0.10
Iron	0.3	0.03	0.53	0.35	0.30	0.11	0.25	0.29
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	11	9	8	10	12	7
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	<0.025	0.07	<0.025	0.04	0.06	0.07
NH3 (un-ionized Ammonia[a])	0.02		<0.001	0.00064944	<0.005	0.00194711	0.00157318	0.00097884
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	4.42	2.97	0.51	2.27	9.22	4.90
pH (pH units)	6.5-8.5		8.23	8.14	8.62	8.08	8.22	7.90
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Potassium		1	2	1	1	2	2	2
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	10	11	16	25	14	8
Sulphate		1	53	45	29	90	69	23
TDS (COND - CALC)		1	362	311	265	384	405	257
Total Kjeldahl Nitrogen		0.1	0.93	0.73	0.72	0.87	3.00	1.10
Total Phosphorus	0.03*	0.01	0.03	0.021	0.022	0.026	0.030	0.090
Total Suspended Solids		2	15	4	4	<3	12	3
Vanadium	0.006*	0.001	0.001	0.001	0.002	0.001	<0.001	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			15.34	13.66	12.36	7.84	15.59	11.21
Temperature (ºC)		-100	5.23	-0.26	24.4	20.63	2.7	14.7
pH (field) (pH units)	6.5-8.5		8.55	7.98	8.56	7.96	8.33	7.64
Conductivity (field) (µS/cm)			831	535	431	640	620	375
field notes			*8				*4	

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW3

LAB ID:		1318896	1348863	1348863	1396810	1404455
Date Sampled:		9/6/2017	3/13/2018	7/12/2018	11/1/2018	12/17/2018
Sample ID:						
PARAMETER	PWQO	MRL				
Alkalinity as CaCO3		5	166	168	239	146	138
Al (dissolved)	0.075*	0.01	0.23	0.09	0.02	<0.01	<0.01
Aluminium		0.01	0.45	0.48	3.89	0.21	0.14
Arsenic	0.1	0.001	<0.001	<0.001	0.003	<0.001	<0.001
Barium		0.01	0.05	0.04	0.10	0.06	0.05
Biochemical Oxygen Demand		1	<1	<1	10	1	<1
Boron	0.2*	0.01	0.03	<0.01	0.09	0.02	0.01
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	78	78	94	76	87
Chemical Oxygen Demand		5	93	18	95	17	20
Chloride		1	18	30	108	27	30
Chromium (total)	0.0089**	0.001	0.001	<0.001	0.010	<0.001	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0005	0.0002	0.0025	<0.0002	<0.0002
Conductivity (µS/cm)		5	423	484	814	494	540
Copper	0.005	0.001	0.004	0.001	0.007	0.001	0.002
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	228	228	305	231	258
HCO3 as CaCO3		1	166	168	239	146	138
Fe (dissolved)		0.03	0.43	0.17	0.09	0.04	0.05
Iron	0.3	0.03	0.66	0.46	4.12	0.23	0.16
Lead	0.025	0.001	<0.001	<0.001	0.002	<0.001	<0.001
Magnesium		1	8	8	17	10	10
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	0.007	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.06	0.11	0.43	0.06	0.04
NH3 (un-ionized Ammonia[a])	0.02			0.00081355	0.00516127		0.00014951
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.88	3.61	<0.10	0.75	5.26
pH (pH units)	6.5-8.5		8.11	8.06	7.84	7.97	7.80
Phenols	0.001	0.001	<0.001	0.002	0.005	<0.001	<0.001
Potassium		1	2	1	7	4	1
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	10	14	43	12	12
Sulphate		1	22	24	38	75	80
TDS (COND - CALC)		1	275	315	529	321	351
Total Kjeldahl Nitrogen		0.1	1.70	1.60	2.54	0.60	0.60
Total Phosphorus	0.03*	0.01	0.060	0.030	0.485	0.028	0.011
Total Suspended Solids		2	8	17	255	4	2
Vanadium	0.006*	0.001	0.002	0.001	0.010	<0.001	<0.001
Zinc	0.02*	0.01	<0.01	<0.01	0.02	<0.01	<0.01
Field Data:							
Dissolved Oxygen				12.28	N/A	N/A	10.66
Temperature (ºC)		-100		2.1	23.4	4.7	0.5
pH (field) (pH units)	6.5-8.5			7.88	7.38	N/A	7.64
Conductivity (field) (µS/cm)				460	609	456	529
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
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[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
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na-Temp = na, Temperature unavailable for calc.
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*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2_3A

LAB ID:			1104051	1127825	1147926		1173930	1198011
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:			2104	9221	4074		2325	1952
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	184	214	214		175	220
Al (dissolved)	0.075*	0.01	0.04	0.01	0.02		0.06	0.01
Aluminium		0.01	0.30	0.41	0.32		1.03	0.33
Arsenic	0.1	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Barium		0.01	0.04	0.04	0.04		0.05	0.03
Biochemical Oxygen Demand		1	2	<1	<1		2	1
Boron	0.2*	0.01	0.05	0.06	0.03		0.05	0.09
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Calcium		1	73	84	94		79	87
Chemical Oxygen Demand		5	31	37	26		49	50
Chloride		1	16	19	24		31	45
Chromium (total)	0.0089**	0.001	<0.001	0.001	<0.001		0.002	<0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	5	6	N/A-PH		N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0002	0.0003	0.0002		0.0007	0.0003
Conductivity (µS/cm)		5	428	536	568		525	590
Copper	0.005	0.001	0.001	0.002	0.002		0.003	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	219	259	288		238	275
HCO3 as CaCO3		1	179	208	214		175	220
Fe (dissolved)		0.03	0.14	0.04	0.04		0.08	<0.03
Iron	0.3	0.03	0.44	0.46	0.35		1.08	0.42
Lead	0.025	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Magnesium		1	9	12	13		10	14
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005		<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.31	0.08	0.08		0.43	0.05
NH3 (un-ionized Ammonia[a])	0.02		0.06539697	0.00777351	0.00021863		0.01924511	0.00477232
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10		<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.77	0.32	1.44		3.04	<0.10
pH (pH units)	6.5-8.5		8.46	8.48	8.05		8.16	8.24
Phenols	0.001	0.001	<0.001	<0.002	<0.001		<0.001	<0.002
Potassium		1	2	2	3		4	3
Selenium	0.1	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Sodium		2	14	22	15		19	39
Sulphate		1	26	39	42		30	45
TDS (COND - CALC)		1	278	348	369		341	384
Total Kjeldahl Nitrogen		0.1	1.09	0.85	0.65		1.51	0.78
Total Phosphorus	0.03*	0.01	0.09	0.11	0.06		0.34	0.10
Total Suspended Solids		2	6	8	14		55	4
Vanadium	0.006*	0.001	0.002	0.002	0.001		0.003	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01		<0.01	<0.01
Field Data:								
Dissolved Oxygen			1.03	4.25	3.7		8.36	8.15
Temperature (ºC)		-100	22.7	21	0.2		17.97	18.52
pH (field) (pH units)	6.5-8.5		8.64	8.31	7.43		8.05	8.39
Conductivity (field) (µS/cm)			597	783	708		580	897
field notes			*1	*8		*4		*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2_3A

LAB ID:		1214684	1226557	1239651	1256600	1271511		1292332
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		6906	8114	9290	4296	929		3523
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	209	182	202	159	170	172
Al (dissolved)	0.075*	0.01	0.04	0.03	0.02	0.02	0.03	0.03
Aluminium		0.01	0.59	0.29	0.22	0.19	0.24	0.31
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.05	0.04	0.04	0.06	0.05	0.04
Biochemical Oxygen Demand		1	3	<1	2	1	<1	1
Boron	0.2*	0.01	0.09	0.07	0.12	0.20	0.04	0.10
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	98	80	71	90	105	74
Chemical Oxygen Demand		5	53	46	53	59	37	54
Chloride		1	34	26	31	46	35	22
Chromium (total)	0.0089**	0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0004	0.0002	0.0004	<0.0002	<0.0002	0.0003
Conductivity (µS/cm)		5	636	540	521	670	634	479
Copper	0.005	0.001	0.002	0.001	0.002	0.002	0.001	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	302	245	223	278	316	226
HCO3 as CaCO3		1	209	182	202	159	170	172
Fe (dissolved)		0.03	0.07	0.09	0.09	0.05	0.04	0.09
Iron	0.3	0.03	0.63	0.33	0.32	0.14	0.21	0.34
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	14	11	11	13	13	10
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	1.08	1.39	2.49	0.05	0.04	2.63
NH3 (un-ionized Ammonia[a])	0.02		0.02392971	0.00712928	0.3455643	0.00088277	0.00069864	0.01794426
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	3.80	3.11	1.08	3.82	8.04	4.81
pH (pH units)	6.5-8.5		8.12	8.10	8.29	8.07	8.20	7.99
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Potassium		1	4	3	4	6	3	4
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	23	19	28	39	18	17
Sulphate		1	61	50	31	119	74	32
TDS (COND - CALC)		1	413	351	339	436	412	311
Total Kjeldahl Nitrogen		0.1	1.93	2.54	3.70	1.16	2.70	3.90
Total Phosphorus	0.03*	0.01	0.11	0.060	0.084	0.059	0.060	0.150
Total Suspended Solids		2	18	4	5	<2	3	12
Vanadium	0.006*	0.001	0.002	0.001	0.001	0.002	<0.001	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			13.7	12.19	13.64	5.82	17.13	11.66
Temperature (ºC)		-100	3.41	-0.23	14.53	19.23	1.6	9.8
pH (field) (pH units)	6.5-8.5		8.23	7.72	8.69	7.57	8.19	7.49
Conductivity (field) (µS/cm)			962	609	557	736	640	472
field notes							*4	

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW2_3A

LAB ID:		1318899	1348863	1396819	1404458
Date Sampled:		9/6/2017	3/13/2018	11/1/2018	12/17/2018
Sample ID:					

PARAMETER	PWQO	MRL				
Alkalinity as CaCO3		5	239	143	143	135
Al (dissolved)	0.075*	0.01	0.20	0.23	<0.01	0.02
Aluminium		0.01	0.56	0.57	0.63	0.21
Arsenic	0.1	0.001	0.003	0.001	<0.001	<0.001
Barium		0.01	0.05	0.03	0.06	0.04
Biochemical Oxygen Demand		1	6	2	2	3
Boron	0.2*	0.01	0.11	0.06	0.09	0.05
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	125	60	88	82
Chemical Oxygen Demand		5	111	50	26	26
Chloride		1	48	23	42	31
Chromium (total)	0.0089**	0.001	0.001	0.001	0.001	<0.001
Cr(VI)	0.001	0.05				
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0004	0.0003	0.0003	<0.0002
Conductivity (µS/cm)		5	817	430	704	558
Copper	0.005	0.001	0.003		0.003	0.002
Dissolved Organic Carbon		0.5				
Hardness as CaCO3		1	386	187	286	250
HCO3 as CaCO3		1	239	143	143	135
Fe (dissolved)		0.03	0.21	0.19	<0.03	0.04
Iron	0.3	0.03	0.49		0.43	0.21
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	18	9	16	11
Manganese		0.005				
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	2.47	1.01	0.11	0.09
NH3 (un-ionized Ammonia[a])	0.02			0.00908198	0.00147666	0.0003088
N-NO2 (Nitrite)		0.1	0.240	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	4.89	1.89		4.48
pH (pH units)	6.5-8.5		8.28	7.92	7.95	7.82
Phenols	0.001	0.001	<0.001	<0.001	0.002	<0.001
Potassium		1	22	5	8	4
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001				
Sodium		2	25	15	32	16
Sulphate		1	94	26	141	83
TDS (COND - CALC)		1	531	280	458	363
Total Kjeldahl Nitrogen		0.1	5.90	3.80	1.10	1.00
Total Phosphorus	0.03*	0.01	1.67	0.56	0.06	0.30
Total Suspended Solids		2	32	35	10	18
Vanadium	0.006*	0.001	0.004	0.002	0.002	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01
Field Data:						
Dissolved Oxygen				12.27	N/A	11.87
Temperature (ºC)		-100		1.7	5.8	0.3
pH (field) (pH units)	6.5-8.5			7.98	8.01	7.61
Conductivity (field) (µS/cm)				387	1012	501
field notes						

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW4

LAB ID:	1088449	1104055	1127827	1147929	1160830	1173934	1198014
Date Sampled:	2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:	2809	406	2347	9528	1206	6383	1000

PARAMETER	PWQO	MRL							
Alkalinity as CaCO3		5	152	158	188	180	169	160	176
Al (dissolved)	0.075*	0.01	0.02	0.03	0.01	<0.01	0.01	0.02	<0.01
Aluminium		0.01	0.06	0.21	0.21	0.07	0.09	0.13	0.31
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.05	0.05	0.05	0.05	0.05	0.05	0.07
Biochemical Oxygen Demand		1	<1	<1	<1	<1	<1	<1	<1
Boron	0.2*	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	69	66	80	82	77	78	78
Chemical Oxygen Demand		5	18	36	25	23	23	31	42
Chloride		1	16	15	21	24	17	30	46
Chromium (total)	0.0089**	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	4	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	<0.0002	0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0003
Conductivity (µS/cm)		5	428	378	475	503	447	490	554
Copper	0.005	0.001	<0.001	<0.001	0.001	0.002	<0.001	0.001	0.001
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	209	198	241	250	233	232	240
HCO3 as CaCO3		1	152	158	184	180	169	160	176
Fe (dissolved)		0.03	0.20	0.17	0.07	0.08	0.08	0.10	0.04
Iron	0.3	0.03	0.30	0.49	0.37	0.19	0.27	0.28	0.55
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	9	8	10	11	10	9	11
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.14	0.19	0.08	0.02	0.09	0.03	0.04
NH3 (un-ionized Ammonia[a])	0.02		0.0018	0.0116	0.0054	0.0002	0.0021	0.0011	0.0048
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.93	0.95	0.58	1.25	0.80	3.28	0.79
pH (pH units)	6.5-8.5		7.97	8.16	8.34	8.10	8.08	8.15	8.16
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002
Potassium		1	<1	1	1	1	1	1	2
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	10	9	14	14	8	16	29
Sulphate		1	39	21	31	39	45	26	37
TDS (COND - CALC)		1	278	246	309	327	291	318	360
Total Kjeldahl Nitrogen		0.1	0.58	1.03	0.74	0.27	0.43	0.66	0.42
Total Phosphorus	0.03*	0.01	0.01	0.04	0.03	0.02	0.02	0.05	0.12
Total Suspended Solids		2	<2	10	6	<2	4	2	5
Vanadium	0.006*	0.001	<0.001	0.001	0.001	<0.001	<0.001	0.001	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:									
Dissolved Oxygen			1.54	2.63	6.65	4.09	1.80	10.17	8.99
Temperature (ºC)		-100	0.8	23.4	18.1	0.3	0.1	16.7	18.3
pH (field) (pH units)	6.5-8.5		8.08	8.02	8.23	8.05	8.38	8.00	8.50
Conductivity (field) (µS/cm)			630	550	685	772	590	518	807
field notes									*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW4

LAB ID:		1214690	1226560	1239656	1256604	1271515	1280589	1292330
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		239	2311	2010	3163	7866	8758	1906
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	181	159	148	152	159	130	129
Al (dissolved)	0.075*	0.01	0.02	0.02	0.02	0.04	0.01	0.02	0.03
Aluminium		0.01	0.21	0.19	0.06	0.18	0.04	0.13	0.12
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.05	0.05	0.04	0.08	0.06	0.05	0.04
Biochemical Oxygen Demand		1	1	<1	1	1	<1	2	<1
Boron	0.2*	0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	93	72	62	81	101	62	65
Chemical Oxygen Demand		5	28	36	40	37	24	32	29
Chloride		1	29	23	26	49	34	20	18
Chromium (total)	0.0089**	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	6	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Conductivity (µS/cm)		5	548	459	402	565	605	434	373
Copper	0.005	0.001	0.001	<0.001	0.001	0.001	<0.001	<0.001	0.001
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	278	217	188	239	302	188	191
HCO3 as CaCO3		1	181	159	142	152	159	130	129
Fe (dissolved)		0.03	0.09	0.14	0.10	0.10	0.07	0.11	0.09
Iron	0.3	0.03	0.32	0.46	0.21	0.28	0.12	0.25	0.22
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	11	9	8	9	12	8	7
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.13	0.05	<0.025	0.03	0.04	<0.02	0.03
NH3 (un-ionized Ammonia[a])	0.02		0.0045	0.0007	<0.0032	0.0024	0.0010	<0.0058	0.0005
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	4.09	2.90	0.67	1.16	9.70	3.23	4.90
pH (pH units)	6.5-8.5		8.14	8.18	8.62	8.13	8.21	8.13	8.06
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Potassium		1	2	<1	1	2	2	1	2
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	12	11	17	28	16	8	9
Sulphate		1	47	42	28	69	66	51	22
TDS (COND - CALC)		1	356	298	261	367	393	282	242
Total Kjeldahl Nitrogen		0.1	0.92	0.64	0.76	0.62	2.40	1.10	1.00
Total Phosphorus	0.03*	0.01	0.05	0.037	0.024	0.031	<0.01	0.020	0.020
Total Suspended Solids		2	<3	6	<2	5	<2	4	3
Vanadium	0.006*	0.001	<0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:									
Dissolved Oxygen			12.40	13.52	11.96	8.50	14.28	13.35	10.80
Temperature (ºC)		-100	5.2	-0.3	19.6	20.8	3.3	0.0	15.0
pH (field) (pH units)	6.5-8.5		8.37	8.16	8.48	8.20	8.29	7.40	7.70
Conductivity (field) (µS/cm)			817	520	424	613	605	467	368
field notes									

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SW4

LAB ID:		1318897	1348865	1371013	1396818	1404456
Date Sampled:		9/6/2017	3/13/2018	7/12/2018	11/1/2018	12/17/2018
Sample ID:						

PARAMETER	PWQO	MRL					
Alkalinity as CaCO3		5	189	152	185	140	139
Al (dissolved)	0.075*	0.01	0.05	0.09	<0.01	<0.01	0.01
Aluminium		0.01	0.10	0.14	0.22	0.07	0.04
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.06	0.04	0.06	0.06	0.06
Biochemical Oxygen Demand		1	<1	1	1	<1	1
Boron	0.2*	0.01	0.02	<0.01	0.02	0.01	0.01
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	86	74	67	77	85
Chemical Oxygen Demand		5	38	23	27	18	21
Chloride		1	25	34	40	37	31
Chromium (total)	0.0089**	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Conductivity (µS/cm)		5	505	483	524	535	538
Copper	0.005	0.001	0.001		0.001	0.001	<0.001
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	256	218	204	233	253
HCO3 as CaCO3		1	189	152	185	140	139
Fe (dissolved)		0.03	0.21	0.21	0.06	0.04	0.09
Iron	0.3	0.03	0.33	0.22	0.29	0.13	0.16
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	10	8	9	10	10
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.04	0.09	0.05	<0.02	0.05
NH3 (un-ionized Ammonia[a])	0.02			0.0012	0.0012		0.0002
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	2.07	3.23	0.52	1.85	4.61
pH (pH units)	6.5-8.5		8.26	7.98	8.26	8.03	7.90
Phenols	0.001	0.001	<0.001	0.003	0.001	<0.001	<0.001
Potassium		1	2	1	2	2	1
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001			
Sodium		2	16	19	17	18	12
Sulphate		1	28	24	27	92	76
TDS (COND - CALC)		1	328	314	341	348	350
Total Kjeldahl Nitrogen		0.1	<0.8	1.20	0.73	0.60	0.60
Total Phosphorus	0.03*	0.01	0.040	0.040	0.040	0.021	0.012
Total Suspended Solids		2	4	10	3	2	<2
Vanadium	0.006*	0.001	0.001	<0.001	0.002	<0.001	<0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:							
Dissolved Oxygen				12.32	N/A	N/A	9.80
Temperature (ºC)		-100		-1.0	18.0	7.3	1.5
pH (field) (pH units)	6.5-8.5			8.24	7.86	8.13	7.63
Conductivity (field) (µS/cm)				549	450	410	560
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWD2

LAB ID:			1104053				1173932	
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:			4429				633	

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	240				182	
Al (dissolved)	0.075*	0.01	0.02				<0.01	
Aluminium		0.01	0.23				0.21	
Arsenic	0.1	0.001	0.002				0.002	
Barium		0.01	0.03				0.04	
Biochemical Oxygen Demand		1	3				17	
Boron	0.2*	0.01	0.20				0.11	
Cadmium	0.0002	0.0001	<0.0001				<0.0001	
Calcium		1	86				68	
Chemical Oxygen Demand		5	97				186	
Chloride		1	26				20	
Chromium (total)	0.0089**	0.001	<0.001				<0.001	
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	5				N/A-PH	
Cobalt	0.0009	0.0002	0.0002				0.0003	
Conductivity (µS/cm)		5	598				500	
Copper	0.005	0.001	<0.001				0.001	
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	272				211	
HCO3 as CaCO3		1	235				182	
Fe (dissolved)		0.03	0.05				0.07	
Iron	0.3	0.03	0.30				0.38	
Lead	0.025	0.001	<0.001				<0.001	
Magnesium		1	14				10	
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001				<0.0001	
Nickel	0.025	0.005	<0.005				<0.005	
N-NH3 (Ammonia)		0.02	0.16				2.74	
NH3 (un-ionized Ammonia[a])	0.02		0.0249				0.0458	
N-NO2 (Nitrite)		0.1	<0.10				<0.10	
N-NO3 (Nitrate)		0.1	<0.10				<0.10	
pH (pH units)	6.5-8.5		8.32				7.80	
Phenols	0.001	0.001	<0.001				0.009	
Potassium		1	5				18	
Selenium	0.1	0.001	<0.001				<0.001	
Silver	0.0001	0.0001	<0.0001				<0.0001	
Sodium		2	36				12	
Sulphate		1	44				35	
TDS (COND - CALC)		1	389				325	
Total Kjeldahl Nitrogen		0.1	2.59				9.70	
Total Phosphorus	0.03*	0.01	0.62				2.25	
Total Suspended Solids		2	33				80	
Vanadium	0.006*	0.001	0.002				<0.001	
Zinc	0.02*	0.01	<0.01				<0.01	
Field Data:								
Dissolved Oxygen			2.24				2.95	
Temperature (ºC)		-100	28.4				23.1	
pH (field) (pH units)	6.5-8.5		8.31				7.45	
Conductivity (field) (µS/cm)			865				524	
field notes			*4		*4	*4	*4		*4

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWD2

LAB ID:		1214687		1239654		1271512	1280588	1292328
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		9655		88		8398	4575	1886

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	182		227	152	176	165
Al (dissolved)	0.075*	0.01	<0.01		0.02	0.01	0.04	<0.01
Aluminium		0.01	0.10		0.09	0.12	0.22	0.03
Arsenic	0.1	0.001	0.001		0.002	0.002	0.001	0.002
Barium		0.01	0.02		0.02	0.02	0.02	0.03
Biochemical Oxygen Demand		1	1		6	<1	<1	2
Boron	0.2*	0.01	0.13		0.12	0.16	0.16	0.18
Cadmium	0.0002	0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	87		77	83	72	84
Chemical Oxygen Demand		5	85		121	71	69	90
Chloride		1	20		25	34	78	21
Chromium (total)	0.0089**	0.001	<0.001		<0.001	<0.001	<0.001	<0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH		7	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	<0.0002		0.0002	<0.0002	<0.0002	<0.0002
Conductivity (µS/cm)		5	539		548	587	728	533
Copper	0.005	0.001	<0.001		0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	275		250	257	229	259
HCO3 as CaCO3		1	182		220	152	176	165
Fe (dissolved)		0.03	0.04		0.07	0.05	0.06	<0.03
Iron	0.3	0.03	0.17		0.18	0.10	0.13	0.06
Lead	0.025	0.001	<0.001		<0.001	<0.001	0.001	<0.001
Magnesium		1	14		14	12	12	12
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005		<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.44		0.20	0.18	0.42	0.47
NH3 (un-ionized Ammonia[a])	0.02		0.0063		0.1150	0.0012	0.0008	0.0023
N-NO2 (Nitrite)		0.1	<0.10		<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.65		0.15	2.51	1.09	4.38
pH (pH units)	6.5-8.5		8.09		8.54	7.99	8.17	7.93
Phenols	0.001	0.001	<0.001		<0.001	0.002	0.001	0.002
Potassium		1	5		9	8	4	3
Selenium	0.1	0.001	<0.001		<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	17		29	31	56	26
Sulphate		1	75		38	94	74	67
TDS (COND - CALC)		1	350		356	382	473	346
Total Kjeldahl Nitrogen		0.1	1.61		2.47	3.40	2.30	2.70
Total Phosphorus	0.03*	0.01	0.59		0.830	1.030	0.630	0.890
Total Suspended Solids		2	21		15	<2	10	23
Vanadium	0.006*	0.001	<0.001		0.001	<0.001	<0.001	<0.001
Zinc	0.02*	0.01	<0.01		<0.01	<0.01	<0.01	<0.01
Field Data:								
Dissolved Oxygen			14.14		14.51	16.25	12.19	7.91
Temperature (ºC)		-100	4.6		27.4	0.3	0.4	23.5
pH (field) (pH units)	6.5-8.5		8.00		9.12	7.91	7.35	6.99
Conductivity (field) (µS/cm)			829		577	592	796	532
field notes			*4	*4		*4		

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWD2

LAB ID:		1318895	1348862		1396809	1404457
Date Sampled:		9/6/2017	3/13/2018		11/1/2018	2018-12-17
Sample ID:						

PARAMETER	PWQO	MRL					
Alkalinity as CaCO3		5	289	162		142	67
Al (dissolved)	0.075*	0.01	0.07	0.02		<0.01	<0.01
Aluminium		0.01	0.07	0.10		0.29	0.03
Arsenic	0.1	0.001	0.002	0.001		<0.001	0.002
Barium		0.01	0.04	0.02		0.06	0.01
Biochemical Oxygen Demand		1	5	1		1	2
Boron	0.2*	0.01	0.10	0.08		0.03	0.12
Cadmium	0.0002	0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Calcium		1	116	70		76	50
Chemical Oxygen Demand		5	137	64		17	52
Chloride		1	28	21		25	22
Chromium (total)	0.0089**	0.001	<0.001	<0.001		<0.001	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	N/A-PH	N/A-PH		N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0003	<0.0002		<0.0002	<0.0002
Conductivity (µS/cm)		5	711	487		499	396
Copper	0.005	0.001	<0.001	0.002		0.002	<0.001
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	356	220		231	158
HCO3 as CaCO3		1	289	162		142	67
Fe (dissolved)		0.03	0.20	0.06		0.03	<0.03
Iron	0.3	0.03	0.34	0.17		0.29	0.06
Lead	0.025	0.001	<0.001	<0.001		<0.001	<0.001
Magnesium		1	16	11		10	8
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005		<0.005	<0.005
N-NH3 (Ammonia)		0.02	1.49	0.86		0.09	0.10
NH3 (un-ionized Ammonia[a])	0.02		0.0000				
N-NO2 (Nitrite)		0.1	<0.10	<0.10		<0.10	<0.10
N-NO3 (Nitrate)		0.1	<0.10	1.63		0.88	4.18
pH (pH units)	6.5-8.5		8.12	7.83		7.99	7.47
Phenols	0.001	0.001	<0.001	0.001		0.002	<0.001
Potassium		1	5	4		4	10
Selenium	0.1	0.001	<0.001	<0.001		<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	29	22		13	12
Sulphate		1	46	51		74	69
TDS (COND - CALC)		1	462	317		324	257
Total Kjeldahl Nitrogen		0.1	3.90	4.00		0.60	1.50
Total Phosphorus	0.03*	0.01	2.270	0.820		0.030	1.470
Total Suspended Solids		2	62	25		6	10
Vanadium	0.006*	0.001	0.001	<0.001		0.001	<0.001
Zinc	0.02*	0.01	<0.01	<0.01		<0.01	<0.01
Field Data:							
Dissolved Oxygen				N/A	N/A	N/A	12.89
Temperature (ºC)		-100		3.30	N/A	4.6	0.5
pH (field) (pH units)	6.5-8.5			7.9	N/A	8.23	7.71
Conductivity (field) (µS/cm)				477.00	N/A	435	386
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC1

LAB ID:		1088446	1104047	1127820	1147924	1160834	1173925	1198009
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:		9565	1322	9189	6789	671	9761	6979

PARAMETER	PWQO	MRL							
Alkalinity as CaCO3		5	190	187	202	257	211	195	227
Al (dissolved)	0.075*	0.01	0.01	0.06	0.01	0.03	0.05	0.04	0.16
Aluminium		0.01	0.42	0.53	0.84	0.40	0.48	0.71	0.99
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Barium		0.01	0.06	0.05	0.05	0.06	0.05	0.05	0.05
Biochemical Oxygen Demand		1	2	1	2	<1	1	1	3
Boron	0.2*	0.01	0.04	0.04	0.07	0.06	0.06	0.05	0.10
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	74	74	74	106	79	84	69
Chemical Oxygen Demand		5	29	29	40	26	32	36	33
Chloride		1	34	13	12	30	16	16	19
Chromium (total)	0.0089**	0.001	<0.001	<0.001	0.002	<0.001	0.002	0.001	0.003
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0003	0.0003	0.0006	0.0003	0.0003	0.0004	0.0009
Conductivity (µS/cm)		5	543	440	489	671	524	523	496
Copper	0.005	0.001	0.002	0.002	0.003	0.002	0.002	0.002	0.004
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	230	226	234	335	255	267	230
HCO3 as CaCO3		1	190	187	202	257	211	195	227
Fe (dissolved)		0.03	0.09	0.10	0.04	0.05	0.08	0.08	0.13
Iron	0.3	0.03	0.53	0.49	0.96	0.43	0.65	0.72	1.41
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	11	10	12	17	14	14	14
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.52	0.25	0.09	0.16	0.58	0.10	0.11
NH3 (un-ionized Ammonia[a])	0.02		0.0015	0.0083	0.0019	0.0007	0.0070	0.0045	0.0016
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.17	1.61	1.35	2.34	0.80	3.37	0.23
pH (pH units)	6.5-8.5		8.08	8.10	8.10	8.11	8.15	8.13	8.16
Phenols	0.001	0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002
Potassium		1	2	2	3	4	4	3	4
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	28	14	18	28	23	14	21
Sulphate		1	32	28	37	60	36	44	22
TDS (COND - CALC)		1	353	286	318	436	341	340	322
Total Kjeldahl Nitrogen		0.1	1.20	1.14	0.99	0.83	0.96	1.11	0.74
Total Phosphorus	0.03*	0.01	0.06	0.05	0.09	0.06	0.10	0.07	0.13
Total Suspended Solids		2	15	7	22	9	12	20	18
Vanadium	0.006*	0.001	0.001	0.001	0.003	0.001	0.001	0.002	0.004
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Field Data:									
Dissolved Oxygen			4.31	1.11	3.70	4.18	1.81	8.44	7.01
Temperature (ºC)		-100	0.4	17.8	16.8	0.5	0.2	17.1	16.9
pH (field) (pH units)	6.5-8.5		7.46	7.92	7.75	7.60	8.08	8.08	7.60
Conductivity (field) (µS/cm)			827	644	718	662	756	558	730
field notes					*8				*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC1

LAB ID:		1214680	1226554	1239648	1256597	1271508	1280586	1292324
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		544	908	5603	6224	6813	6434	970
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	240	210	193	160	232	197	167
Al (dissolved)	0.075*	0.01	0.03	0.03	0.01	0.05	0.03	0.02	0.02
Aluminium		0.01	0.93	0.39	0.24	0.94	0.27	0.26	0.37
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium		0.01	0.07	0.05	0.04	0.07	0.07	0.05	0.04
Biochemical Oxygen Demand		1	1	<1	1	3	1	2	<1
Boron	0.2*	0.01	0.05	0.04	0.04	0.10	0.04	0.04	0.03
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	114	93	72	88	107	76	78
Chemical Oxygen Demand		5	33	36	46	64	29	26	33
Chloride		1	23	19	16	16	25	21	15
Chromium (total)	0.0089**	0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	0.001
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0005	0.0003	0.0002	0.0004	0.0002	<0.0002	0.0003
Conductivity (µS/cm)		5	660	571	457	525	674	549	443
Copper	0.005	0.001	0.002	0.002	0.002	0.003	0.002	0.001	0.002
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	351	286	229	269	337	239	236
HCO3 as CaCO3		1	240	210	193	160	232	197	167
Fe (dissolved)		0.03	0.06	0.07	0.09	0.10	0.05	0.10	0.07
Iron	0.3	0.03	0.93	0.40	0.34	0.67	0.29	0.32	0.37
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium		1	16	13	12	12	17	12	10
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.12	0.21	0.06	0.20	0.14	0.18	0.19
NH3 (un-ionized Ammonia[a])	0.02		0.0007	0.0006	0.0007	0.0053	0.0011	0.0007	0.0011
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	0.120	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	6.28	4.90	1.10	5.13	6.23	3.36	4.21
pH (pH units)	6.5-8.5		8.18	8.19	8.20	8.10	8.25	8.23	8.03
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Potassium		1	3	2	2	4	4	2	3
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium		2	14	15	17	12	20	15	10
Sulphate		1	61	46	33	81	75	49	34
TDS (COND - CALC)		1	429	371	297	341	438	357	288
Total Kjeldahl Nitrogen		0.1	0.99	1.13	2.15	1.36	2.50	1.30	1.20
Total Phosphorus	0.03*	0.01	0.04	0.038	0.034	0.089	0.030	0.050	0.040
Total Suspended Solids		2	18	6	5	8	6	5	11
Vanadium	0.006*	0.001	0.002	0.001	<0.001	0.003	<0.001	<0.001	0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:									
Dissolved Oxygen			13.25	13.16	11.73	6.20	19.74	12.49	11.78
Temperature (ºC)		-100	2.7	-0.3	9.1	19.4	0.7	0.1	6.8
pH (field) (pH units)	6.5-8.5		7.67	7.50	7.71	7.77	7.86	7.60	7.52
Conductivity (field) (µS/cm)			1000	644	496	575	679	596	438
field notes									

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
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*1 Sampling station not sampled
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*4 Not enough water to sample
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*6 See lab reports for QAQC duplicate sample
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EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC1

LAB ID:		1318902	1318902	1318902	1396811	1404462
Date Sampled:		9/6/2017	3/13/2018	7/12/2018	11/1/2018	12/17/2018
Sample ID:						

PARAMETER	PWQO	MRL					
Alkalinity as CaCO3		5	206	191	222	218	156
Al (dissolved)	0.075*	0.01	0.10	0.18	0.01	<0.01	0.01
Aluminium		0.01	0.33	0.55	0.72	0.57	1.37
Arsenic	0.1	0.001	<0.001	<0.001	0.002	<0.001	0.001
Barium		0.01	0.06	0.05	0.06	0.07	0.06
Biochemical Oxygen Demand		1	2	<1	2	2	2
Boron	0.2*	0.01	0.05	0.03	0.11	0.09	0.07
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	88	84	55	92	83
Chemical Oxygen Demand		5	43	79	36	21	48
Chloride		1	17	23	16	17	44
Chromium (total)	0.0089**	0.001	<0.001	<0.001	0.002	0.002	0.003
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	4	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0002	0.0003	0.0006	0.0004	0.0010
Conductivity (µS/cm)		5	513	518	474	660	635
Copper	0.005	0.001	0.002	0.002	0.003	0.002	0.005
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	269	251	187	304	265
HCO3 as CaCO3		1	202	191	222	218	156
Fe (dissolved)		0.03	0.18	0.18	0.05	0.04	0.04
Iron	0.3	0.03	0.46	0.46	0.78	0.69	1.08
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	0.001
Magnesium		1	12	10	12	18	14
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.07	0.24	0.04	0.18	0.43
NH3 (un-ionized Ammonia[a])	0.02			0.0013	0.0017	0.0021	0.0020
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.39	2.94	<0.10	1.82	3.59
pH (pH units)	6.5-8.5		8.33	8.08	8.25	8.06	8.03
Phenols	0.001	0.001	<0.001	0.003	0.001	0.001	<0.001
Potassium		1	4	2	4	6	7
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	15	15	25	24	27
Sulphate		1	34	34	20	109	92
TDS (COND - CALC)		1	333	337	308	429	413
Total Kjeldahl Nitrogen		0.1	0.90	1.80	0.91	0.90	2.20
Total Phosphorus	0.03*	0.01	0.060	0.050	0.098	0.048	0.611
Total Suspended Solids		2	17	18	21	15	46
Vanadium	0.006*	0.001	0.001	0.001	0.003	0.002	0.003
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:							
Dissolved Oxygen				12.07	N/A	N/A	8.84
Temperature (ºC)		-100		2.7	25.00	4.9	2.4
pH (field) (pH units)	6.5-8.5			7.73	7.9	7.98	7.66
Conductivity (field) (µS/cm)				460	430.00	645	585
field notes							

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Concentrations in mg/L, unless indicated
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[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
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*1 Sampling station not sampled
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*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC2

LAB ID:		1088448	1104052		1147927		1173931	1198012
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:		0935	7188		1879		5355	7728

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	174	150	249		157	202
Al (dissolved)	0.075*	0.01	0.02	0.12	0.02		0.07	0.04
Aluminium		0.01	0.31	0.91	0.35		0.76	0.48
Arsenic	0.1	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Barium		0.01	0.04	0.03	0.06		0.04	0.05
Biochemical Oxygen Demand		1	2	2	<1		1	1
Boron	0.2*	0.01	0.05	0.08	0.04		0.04	0.06
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Calcium		1	62	48	105		69	67
Chemical Oxygen Demand		5	32	60	29		47	32
Chloride		1	13	9	19		16	20
Chromium (total)	0.0089**	0.001	<0.001	0.001	<0.001		0.002	0.002
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH		N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0002	0.0004	0.0002		0.0004	0.0004
Conductivity (µS/cm)		5	433	324	623		427	469
Copper	0.005	0.001	0.001	0.002	0.001		0.002	0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	192	149	328		209	221
HCO3 as CaCO3		1	174	150	249		157	202
Fe (dissolved)		0.03	0.11	0.13	0.05		0.10	0.11
Iron	0.3	0.03	0.45	0.66	0.40		0.74	0.65
Lead	0.025	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Magnesium		1	9	7	16		9	13
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005		<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.76	0.23	0.17		0.11	0.17
NH3 (un-ionized Ammonia[a])	0.02		0.00881447	0.01874462	0.0015466		0.00514229	0.00721227
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10		<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.93	0.81	2.60		2.73	0.16
pH (pH units)	6.5-8.5		7.99	8.10	8.11		8.14	8.12
Phenols	0.001	0.001	<0.001	<0.001	<0.001		<0.001	<0.002
Potassium		1	2	2	3		2	3
Selenium	0.1	0.001	<0.001	<0.001	<0.001		<0.001	<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Sodium		2	20	20	16		12	23
Sulphate		1	26	14	57		27	26
TDS (COND - CALC)		1	281	211	405		278	305
Total Kjeldahl Nitrogen		0.1	1.68	1.28	0.83		0.82	0.75
Total Phosphorus	0.03*	0.01	0.06	0.07	0.04		0.07	0.06
Total Suspended Solids		2	9	15	8		16	7
Vanadium	0.006*	0.001	0.001	0.002	0.001		0.002	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01		<0.01	<0.01
Field Data:								
Dissolved Oxygen			2.2	2.55	4.03		10.34	7.53
Temperature (ºC)		-100	0.5	25.1	0.6		18.27	17.99
pH (field) (pH units)	6.5-8.5		8.05	8.1	7.94		8.06	8.02
Conductivity (field) (µS/cm)			612	488	938		460	615
field notes					*1	*4		*8

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
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*4 Not enough water to sample
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*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC2

LAB ID:		1214686	1226558	1239652	1256601			1292333
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		2458	4199	2209	5686			7054

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	240	209	200	167		167
Al (dissolved)	0.075*	0.01	0.02	0.02	0.01	0.06		0.02
Aluminium		0.01	0.12	0.25	0.20	0.58		0.21
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Barium		0.01	0.06	0.05	0.04	0.07		0.05
Biochemical Oxygen Demand		1	<1	<1	1	1		<1
Boron	0.2*	0.01	0.03	0.03	0.03	0.08		0.02
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium		1	115	94	74	87		84
Chemical Oxygen Demand		5	28	34	44	62		30
Chloride		1	23	20	18	16		17
Chromium (total)	0.0089**	0.001	<0.001	<0.001	<0.001	<0.001		0.001
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH	4	N/A-PH		N/A-PH
Cobalt	0.0009	0.0002	<0.0002	<0.0002	0.0002	0.0002		<0.0002
Conductivity (µS/cm)		5	644	572	461	513		461
Copper	0.005	0.001	0.001	0.001	0.002	0.003		0.002
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	345	284	230	267		247
HCO3 as CaCO3		1	240	209	196	167		167
Fe (dissolved)		0.03	0.06	0.06	0.08	0.10		0.05
Iron	0.3	0.03	0.22	0.30	0.35	0.40		0.27
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium		1	14	12	11	12		9
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005		<0.005
N-NH3 (Ammonia)		0.02	0.12	0.18	0.08	0.23		0.14
NH3 (un-ionized Ammonia[a])	0.02		0.0050703	0.00221546	0.01290929	0.00878282		0.00057899
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	0.10		<0.10
N-NO3 (Nitrate)		0.1	6.60	5.34	1.13	4.42		4.80
pH (pH units)	6.5-8.5		8.20	8.22	8.33	8.14		8.05
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Potassium		1	2	2	2	4		2
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Sodium		2	11	10	14	12		8
Sulphate		1	58	45	34	74		35
TDS (COND - CALC)		1	419	372	300	333		300
Total Kjeldahl Nitrogen		0.1	0.56	1.08	0.97	1.27		<0.8
Total Phosphorus	0.03*	0.01	0.02	0.031	0.041	0.068		0.030
Total Suspended Solids		2	3	2	6	6		10
Vanadium	0.006*	0.001	<0.001	<0.001	0.001	0.002		<0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Field Data:								
Dissolved Oxygen			14.33	13.25	12.97	6.8		11.72
Temperature (ºC)		-100	4.73	-0.7	17.3	21.06		10.73
pH (field) (pH units)	6.5-8.5		8.49	8.12	8.7	7.89		7.24
Conductivity (field) (µS/cm)			983	651	498	562		451
field notes							*1 *1	

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWMC2

LAB ID:		1318894	1318894	1318894	1396812	1404463
Date Sampled:		9/6/2017	3/13/2017	7/12/2017	11/1/2017	12/17/2017
Sample ID:						
PARAMETER	PWQO	MRL				
Alkalinity as CaCO3		5	230	201	193	198	204
Al (dissolved)	0.075*	0.01	0.04	0.09	0.02	<0.01	0.03
Aluminium		0.01	0.08		0.58	1.06	0.20
Arsenic	0.1	0.001	<0.001	<0.001	0.002	<0.001	<0.001
Barium		0.01	0.06	0.05	0.06	0.09	0.06
Biochemical Oxygen Demand		1	1	<1	2	2	1
Boron	0.2*	0.01	0.04	0.02	0.10	0.05	0.03
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	103	93	52	98	100
Chemical Oxygen Demand		5	37	19	38	26	14
Chloride		1	21	28	13	20	27
Chromium (total)	0.0089**	0.001	<0.001	<0.001	0.001	0.002	<0.001
Cr(VI)	0.001	0.05					
CO3 as CaCO3		1	4	N/A-PH	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	<0.0002	0.0002	0.0004	0.0008	0.0003
Conductivity (µS/cm)		5	582	569	439	636	616
Copper	0.005	0.001	0.002	0.002	0.002	0.003	0.002
Dissolved Organic Carbon		0.5					
Hardness as CaCO3		1	311	273	175	311	303
HCO3 as CaCO3		1	226	201	193	198	204
Fe (dissolved)		0.03	0.13	0.13	0.13	<0.03	0.05
Iron	0.3	0.03	0.20	0.69	0.73	1.21	0.23
Lead	0.025	0.001	<0.001	<0.001	<0.001	0.001	<0.001
Magnesium		1	13	10	11	16	13
Manganese		0.005					
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	0.05	0.15	0.18	0.16	0.19
NH3 (un-ionized Ammonia[a])	0.02				9.6696E-06	0.0019098	0.00133991
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	1.70	3.70	0.16	1.97	5.79
pH (pH units)	6.5-8.5		8.30	8.08	8.23	8.02	8.09
Phenols	0.001	0.001	0.003	0.002	<0.001	0.003	<0.001
Potassium		1	4	2	3	5	3
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001					
Sodium		2	12	16	19	17	14
Sulphate		1	42	37	20	101	69
TDS (COND - CALC)		1	378	370	285	413	400
Total Kjeldahl Nitrogen		0.1	<0.8	1.50	1.19	2.20	0.80
Total Phosphorus	0.03*	0.01	0.030	0.050	0.092	0.093	0.023
Total Suspended Solids		2	2	13	9	8	5
Vanadium	0.006*	0.001	0.001	0.001	0.003	0.003	<0.001
Zinc	0.02*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:							
Dissolved Oxygen				N/A	N/A	N/A	11.11
Temperature (ºC)		-100		N/A	28.5	4.9	1.8
pH (field) (pH units)	6.5-8.5			N/A	4.87	7.99	7.87
Conductivity (field) (µS/cm)				N/A	435	535	588
field notes							

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWP3

LAB ID:	1214685							
Date Sampled:	11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017	
Sample ID:	8901							

PARAMETER	PWQO	MRL							
Alkalinity as CaCO3		5	357						
Al (dissolved)	0.075*	0.01	0.03						
Aluminium		0.01	0.54						
Arsenic	0.1	0.001	<0.001						
Barium		0.01	0.06						
Biochemical Oxygen Demand		1	1						
Boron	0.2*	0.01	0.12						
Cadmium	0.0002	0.0001	<0.0001						
Calcium		1	114						
Chemical Oxygen Demand		5	24						
Chloride		1	23						
Chromium (total)	0.0089**	0.001	0.001						
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1	N/A-PH						
Cobalt	0.0009	0.0002	0.0003						
Conductivity (µS/cm)		5	969						
Copper	0.005	0.001	0.002						
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1	421						
HCO3 as CaCO3		1	357						
Fe (dissolved)		0.03	0.03						
Iron	0.3	0.03	0.39						
Lead	0.025	0.001	<0.001						
Magnesium		1	33						
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001	<0.0001						
Nickel	0.025	0.005	<0.005						
N-NH3 (Ammonia)		0.02	<0.025						
NH3 (un-ionized Ammonia[a])	0.02		<0.0003						
N-NO2 (Nitrite)		0.1	<0.10						
N-NO3 (Nitrate)		0.1	0.15						
pH (pH units)	6.5-8.5		8.11						
Phenols	0.001	0.001	<0.001						
Potassium		1	10						
Selenium	0.1	0.001	<0.001						
Silver	0.0001	0.0001	<0.0001						
Sodium		2	65						
Sulphate		1	154						
TDS (COND - CALC)		1	630						
Total Kjeldahl Nitrogen		0.1	0.94						
Total Phosphorus	0.03*	0.01	0.03						
Total Suspended Solids		2	9						
Vanadium	0.006*	0.001	0.002						
Zinc	0.02*	0.01	<0.01						
Field Data:									
Dissolved Oxygen			11.61						
Temperature (ºC)		-100	4.5						
pH (field) (pH units)	6.5-8.5		7.99						
Conductivity (field) (µS/cm)			1430						
field notes			*8	*4	*4	*4	*4	*4	*4

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWT1

LAB ID:			1104050	1127824			1173929	
Date Sampled:		2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015
Sample ID:			7256	6115			2837	
PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	342	288			277	
Al (dissolved)	0.075*	0.01	0.03	0.02			0.06	
Aluminium		0.01	0.67	1.28			2.33	
Arsenic	0.1	0.001	0.002	0.004			0.002	
Barium		0.01	0.06	0.04			0.07	
Biochemical Oxygen Demand		1	3	1			7	
Boron	0.2*	0.01	0.13	0.09			0.12	
Cadmium	0.0002	0.0001	<0.0001	<0.0001			<0.0001	
Calcium		1	138	106			118	
Chemical Oxygen Demand		5	62	67			97	
Chloride		1	136	79			102	
Chromium (total)	0.0089**	0.001	0.001	0.003			0.005	
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH	N/A-PH			N/A-PH	
Cobalt	0.0009	0.0002	0.0005	0.0006			0.0014	
Conductivity (µS/cm)		5	1300	1180			1110	
Copper	0.005	0.001	0.002	0.002			0.006	
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	509	392			418	
HCO3 as CaCO3		1	342	288			277	
Fe (dissolved)		0.03	<0.03	0.05			0.06	
Iron	0.3	0.03	0.42	1.07			2.09	
Lead	0.025	0.001	<0.001	<0.001			0.001	
Magnesium		1	40	31			30	
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001			<0.0001	
Nickel	0.025	0.005	<0.005	<0.005			<0.005	
N-NH3 (Ammonia)		0.02	0.18	13.80			0.64	
NH3 (un-ionized Ammonia[a])	0.02		0.01464481	0.11395116			0.04968717	
N-NO2 (Nitrite)		0.1	<0.10	<0.10			0.230	
N-NO3 (Nitrate)		0.1	0.63	0.17			2.24	
pH (pH units)	6.5-8.5		8.29	8.13			8.15	
Phenols	0.001	0.001	<0.001	<0.002			<0.001	
Potassium		1	10	58			15	
Selenium	0.1	0.001	<0.001	<0.001			<0.001	
Silver	0.0001	0.0001	<0.0001	<0.0001			<0.0001	
Sodium		2	95	48			74	
Sulphate		1	148	167			116	
TDS (COND - CALC)		1	845	767			722	
Total Kjeldahl Nitrogen		0.1	1.83	17.60			3.68	
Total Phosphorus	0.03*	0.01	0.37	8.96			0.46	
Total Suspended Solids		2	25	19			188	
Vanadium	0.006*	0.001	0.004	0.004			0.006	
Zinc	0.02*	0.01	<0.01	<0.01			<0.01	
Field Data:								
Dissolved Oxygen			1.3	2.45			15.61	
Temperature (ºC)		-100	24.1	16.2			20.21	
pH (field) (pH units)	6.5-8.5		8.13	7.36			8.23	
Conductivity (field) (µS/cm)			1240	1110			1210	
field notes			*1	*8	*4	*4	*8	*4

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWT1

LAB ID:		1214683			1256599			1292331
Date Sampled:		11/18/2015	2/10/2016	5/11/2016	8/18/2016	11/23/2016	2/8/2017	5/10/2017
Sample ID:		5970			5329			358

PARAMETER	PWQO	MRL						
Alkalinity as CaCO3		5	350		183			255
Al (dissolved)	0.075*	0.01	0.06		0.19			0.01
Aluminium		0.01	1.31		1.36			0.57
Arsenic	0.1	0.001	0.001		<0.001			0.002
Barium		0.01	0.06		0.05			0.05
Biochemical Oxygen Demand		1	3		2			2
Boron	0.2*	0.01	0.17		0.07			0.13
Cadmium	0.0002	0.0001	<0.0001		<0.0001			<0.0001
Calcium		1	150		70			122
Chemical Oxygen Demand		5	70		58			67
Chloride		1	78		164			41
Chromium (total)	0.0089**	0.001	0.003		0.002			0.002
Cr(VI)	0.001	0.05						
CO3 as CaCO3		1	N/A-PH		N/A-PH			N/A-PH
Cobalt	0.0009	0.0002	0.0005		0.0003			0.0004
Conductivity (µS/cm)		5	1130		985			820
Copper	0.005	0.001	0.002		0.005			0.003
Dissolved Organic Carbon		0.5						
Hardness as CaCO3		1	519		224			408
HCO3 as CaCO3		1	350		183			255
Fe (dissolved)		0.03	0.06		0.13			<0.03
Iron	0.3	0.03	0.81		0.55			0.42
Lead	0.025	0.001	<0.001		<0.001			<0.001
Magnesium		1	35		12			25
Manganese		0.005						
Mercury (filtered)	0.0002	0.0001	<0.0001		<0.0001			<0.0001
Nickel	0.025	0.005	<0.005		<0.005			<0.005
N-NH3 (Ammonia)		0.02	1.03		0.05			1.30
NH3 (un-ionized Ammonia[a])	0.02		0.00865989		0.00077529			0.00472306
N-NO2 (Nitrite)		0.1	<0.10		<0.10			<0.10
N-NO3 (Nitrate)		0.1	1.89		0.41			2.58
pH (pH units)	6.5-8.5		8.15		8.06			8.00
Phenols	0.001	0.001	<0.001		<0.001			0.001
Potassium		1	10		6			6
Selenium	0.1	0.001	<0.001		<0.001			<0.001
Silver	0.0001	0.0001	<0.0001		<0.0001			<0.0001
Sodium		2	60		130			34
Sulphate		1	156		69			133
TDS (COND - CALC)		1	734		640			533
Total Kjeldahl Nitrogen		0.1	2.40		1.28			3.40
Total Phosphorus	0.03*	0.01	0.48		0.202			0.280
Total Suspended Solids		2	16		6			28
Vanadium	0.006*	0.001	0.003		0.002			0.002
Zinc	0.02*	0.01	<0.01		<0.01			<0.01
Field Data:								
Dissolved Oxygen			10.99		2.47			9.63
Temperature (ºC)		-100	2.41		19.69			10.54
pH (field) (pH units)	6.5-8.5		7.84		7.49			7.19
Conductivity (field) (µS/cm)			1730		1060			809
field notes				*4	*4	*4	*4	

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWT1

LAB ID:	1318889	1396815	1404459
Date Sampled:	9/6/2017	11/1/2018	12/17/2018
Sample ID:			

PARAMETER	PWQO	MRL			
Alkalinity as CaCO3		5	467	272	138
Al (dissolved)	0.075*	0.01	0.18	<0.01	0.02
Aluminium		0.01	0.46	0.23	0.58
Arsenic	0.1	0.001	0.002	<0.001	<0.001
Barium		0.01	0.06	0.08	0.03
Biochemical Oxygen Demand		1	2	2	3
Boron	0.2*	0.01	0.16	0.11	0.09
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Calcium		1	162	205	77
Chemical Oxygen Demand		5	52	41	44
Chloride		1	83	170	79
Chromium (total)	0.0089**	0.001	0.001	<0.001	0.001
Cr(VI)	0.001	0.05			
CO3 as CaCO3		1	N/A-PH	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0004	<0.0002	0.0002
Conductivity (µS/cm)		5	1210	1870	754
Copper	0.005	0.001	0.002	0.003	0.003
Dissolved Organic Carbon		0.5			
Hardness as CaCO3		1	545	722	266
HCO3 as CaCO3		1	467	272	138
Fe (dissolved)		0.03	0.18	<0.03	<0.03
Iron	0.3	0.03	0.40	0.18	0.39
Lead	0.025	0.001	<0.001	<0.001	<0.001
Magnesium		1	34	51	18
Manganese		0.005			
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	<0.005	<0.005	<0.005
N-NH3 (Ammonia)		0.02	1.09	0.04	0.11
NH3 (un-ionized Ammonia[a])	0.02			0.00031971	0.00040343
N-NO2 (Nitrite)		0.1	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.1	0.24	0.40	3.05
pH (pH units)	6.5-8.5		8.25	7.97	7.72
Phenols	0.001	0.001	<0.001	0.006	<0.001
Potassium		1	11	25	10
Selenium	0.1	0.001	<0.001	<0.001	<0.001
Silver	0.0001	0.0001			
Sodium		2	77	129	46
Sulphate		1	85	497	104
TDS (COND - CALC)		1	786	1310	490
Total Kjeldahl Nitrogen		0.1	2.70	1.20	1.50
Total Phosphorus	0.03*	0.01	0.690	0.375	0.807
Total Suspended Solids		2	15	5	16
Vanadium	0.006*	0.001	0.002	<0.001	0.002
Zinc	0.02*	0.01	<0.01	<0.01	<0.01
Field Data:					
Dissolved Oxygen				N/A	9.87
Temperature (ºC)		-100		5.3	0
pH (field) (pH units)	6.5-8.5			7.8	7.65
Conductivity (field) (µS/cm)				1610	895
field notes					

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWND3

LAB ID:							1173928	
Date Sampled:	2/20/2014	5/15/2014	8/20/2014	11/19/2014	2/18/2015	5/13/2015	8/26/2015	
Sample ID:						4953		

PARAMETER	PWQO	MRL							
Alkalinity as CaCO3		5						303	
Al (dissolved)	0.075*	0.01						0.06	
Aluminium		0.01						0.94	
Arsenic	0.1	0.001						<0.001	
Barium		0.01						0.05	
Biochemical Oxygen Demand		1						2	
Boron	0.2*	0.01						0.13	
Cadmium	0.0002	0.0001						<0.0001	
Calcium		1						105	
Chemical Oxygen Demand		5						40	
Chloride		1						25	
Chromium (total)	0.0089**	0.001						0.002	
Cr(VI)	0.001	0.05							
CO3 as CaCO3		1						N/A-PH	
Cobalt	0.0009	0.0002						0.0004	
Conductivity (µS/cm)		5						878	
Copper	0.005	0.001						0.003	
Dissolved Organic Carbon		0.5							
Hardness as CaCO3		1						390	
HCO3 as CaCO3		1						303	
Fe (dissolved)		0.03						0.06	
Iron	0.3	0.03						0.58	
Lead	0.025	0.001						<0.001	
Magnesium		1						31	
Manganese		0.005							
Mercury (filtered)	0.0002	0.0001						<0.0001	
Nickel	0.025	0.005						<0.005	
N-NH3 (Ammonia)		0.02						<0.02	
NH3 (un-ionized Ammonia[a])	0.02							<0.0009	
N-NO2 (Nitrite)		0.1						<0.10	
N-NO3 (Nitrate)		0.1						0.77	
pH (pH units)	6.5-8.5							8.25	
Phenols	0.001	0.001						<0.001	
Potassium		1						14	
Selenium	0.1	0.001						<0.001	
Silver	0.0001	0.0001						<0.0001	
Sodium		2						53	
Sulphate		1						131	
TDS (COND - CALC)		1						571	
Total Kjeldahl Nitrogen		0.1						1.26	
Total Phosphorus	0.03*	0.01						0.10	
Total Suspended Solids		2						19	
Vanadium	0.006*	0.001						0.003	
Zinc	0.02*	0.01						<0.01	
Field Data:									
Dissolved Oxygen								13.97	
Temperature (ºC)		-100						16.8	
pH (field) (pH units)	6.5-8.5							8.07	
Conductivity (field) (µS/cm)								926	
field notes			*4	*4	*4	*4	*4	*8	*4

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc.
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

EOWHF - Report of Surface Water Monitoring Results (2014-2018)
Sampling Station: SWND3

LAB ID:		1396817	1404460
Date Sampled:		11/1/2018	12/17/2018
Sample ID:			

PARAMETER	PWQO	MRL		
Alkalinity as CaCO3		5	344	332
Al (dissolved)	0.075*	0.01	<0.01	<0.01
Aluminium		0.01	1.38	1.61
Arsenic	0.1	0.001	0.003	0.002
Barium		0.01	0.09	0.07
Biochemical Oxygen Demand		1	164	18
Boron	0.2*	0.01	0.14	0.12
Cadmium	0.0002	0.0001	<0.0001	<0.0001
Calcium		1	126	136
Chemical Oxygen Demand		5	407	53
Chloride		1	84	54
Chromium (total)	0.0089**	0.001	0.003	0.003
Cr(VI)	0.001	0.05		
CO3 as CaCO3		1	N/A-PH	N/A-PH
Cobalt	0.0009	0.0002	0.0020	0.0015
Conductivity (µS/cm)		5	1380	1170
Copper	0.005	0.001	0.010	0.007
Dissolved Organic Carbon		0.5		
Hardness as CaCO3		1	451	488
HCO3 as CaCO3		1	344	332
Fe (dissolved)		0.03	0.18	0.07
Iron	0.3	0.03	1.76	1.94
Lead	0.025	0.001	0.001	0.001
Magnesium		1	33	36
Manganese		0.005		
Mercury (filtered)	0.0002	0.0001	<0.0001	<0.0001
Nickel	0.025	0.005	0.007	<0.005
N-NH3 (Ammonia)		0.02	4.68	1.10
NH3 (un-ionized Ammonia[a])	0.02		0.03956645	0.00371967
N-NO2 (Nitrite)		0.1	<0.10	<0.10
N-NO3 (Nitrate)		0.1	<0.10	<0.10
pH (pH units)	6.5-8.5		7.78	7.91
Phenols	0.001	0.001	0.071	<0.001
Potassium		1	56	22
Selenium	0.1	0.001	<0.001	<0.001
Silver	0.0001	0.0001		
Sodium		2	97	67
Sulphate		1	265	242
TDS (COND - CALC)		1	897	760
Total Kjeldahl Nitrogen		0.1	10.00	6.60
Total Phosphorus	0.03*	0.01	0.248	0.122
Total Suspended Solids		2	56	129
Vanadium	0.006*	0.001	0.003	0.004
Zinc	0.02*	0.01	<0.01	<0.01
Field Data:				
Dissolved Oxygen			N/A	7.65
Temperature (ºC)		-100	6	0.4
pH (field) (pH units)	6.5-8.5		7.8	7.6
Conductivity (field) (µS/cm)			1198	1022
field notes				

MRL = Method Reporting Limit, na = not available
Concentrations in mg/L, unless indicated
Calculations include non-detected values set at half of the MRL
[a] Un-ionized NH3 calc'd from NH3, field pH & Temp
* Interim PWQO only available; or Interim PWQO used for Zinc
** PWQO only available for trivalent Cr, not total Cr
***Field pH na, lab pH used in calculation
N/A-PH = pH < 8.3 calculations not available
na-Temp = na, Temperature unavailable for calc.
*1 Sampling station not sampled
*2 Discharge of leachate released prior to sampling.
*3 Field apparatus malfunction
*4 Not enough water to sample
*5 Field values do not match lab values.
*6 See lab reports for QAQC duplicate sample
*7 Not enough water to sample dissolved O2 in situ
*8 Anomalous or filtered sample; not included in the statistics

Workorder No.: 1820000
Client: Lascelles Engineering Ltd.
Address.: 870 James St.
City: Hawkesbury
Telephone: 613-632-0241
Contact: Shuang Chang
Date Received: 2018-11-01

Eurofins Environment Testing Canada Inc.

8-146 Colonnade Road, Ottawa, ON K2E 7Y1
Service Depots: Missisauga, Kingston, St. Catharines
Toll-free: 1-888-271-8378

Please refer to the accompanying digitally signed PDF version of the report for official results.

				LIMS #	1396816
				Sample ID	SWID-1
				Sample Date	2018-11-01
Analyte	Units	Analytical Method	MRL	Analysis Date	
Ag	mg/L	EPA 200.8	0.0001	2018-11-07	<0.0001
Al (dissolved)	mg/L	EPA 200.8	0.01	2018-11-07	0.02
Al (total)	mg/L	EPA 200.8	0.01	2018-11-07	1.84
Alkalinity as CaCO3	mg/L	SM2320,2510,4500H/F	5	2018-11-07	414
As	mg/L	EPA 200.8	0.001	2018-11-07	0.005
B	mg/L	EPA 200.8	0.01	2018-11-07	0.35
Ba	mg/L	EPA 200.8	0.01	2018-11-07	0.1
BOD5	mg/L	SM 5210B	1	2018-11-08	34
				2018-11-09	
Ca	mg/L	M SM3120B-3500C	1	2018-11-09	121
Cd	mg/L	EPA 200.8	0.0001	2018-11-07	0.0001
Cl	mg/L	SM 4110	1	2018-11-08	120
Co	mg/L	EPA 200.8	0.0002	2018-11-07	0.0028
CO3 as CaCO3	mg/L	SM 2320B	1	2018-11-09	N/A-PH
COD	mg/L	C SM5220C	5	2018-11-07	126
				2018-11-09	
Conductivity	uS/cm	SM2320,2510,4500H/F	5	2018-11-07	1400
Cr	mg/L	EPA 200.8	0.001	2018-11-07	0.005
Cu	mg/L	EPA 200.8	0.001	2018-11-07	0.011
Fe (dissolved)	mg/L	EPA 200.8	0.03	2018-11-07	0.22
Fe (total)	mg/L	EPA 200.8	0.03	2018-11-07	1.58
Filtration		EPA 200.8		2018-11-07	Y
Hardness as CaCO3	mg/L	C SM2340B	1	2018-11-09	417
HCO3 as CaCO3	mg/L	SM 2320B	1	2018-11-09	414
Hg Dissolved	mg/L	EPA 200.8	0.0001	2018-11-07	<0.0001
Hg Total	mg/L	EPA 200.8	0.0001	2018-11-07	<0.0001
K	mg/L	M SM3120B-3500C	1	2018-11-09	39
Mg	mg/L	M SM3120B-3500C	1	2018-11-09	28
Na	mg/L	M SM3120B-3500C	2	2018-11-09	110
Ni	mg/L	EPA 200.8	0.005	2018-11-07	0.01
N-NH3	mg/L	POINTECLAIRE	0.02	2018-11-06	12.3
				2018-11-07	
		SUBCONTRACT P-INORG		2018-11-07	
N-NO2	mg/L	C SM4500-NO3-F	0.1	2018-11-07	<0.10
N-NO3	mg/L	C SM4500-NO3-F	0.1	2018-11-07	<0.10
				2018-11-08	
P	mg/L	EPA 200.8	0.002	2018-11-07	0.55
Pb	mg/L	EPA 200.8	0.001	2018-11-07	0.004
pH		SM2320,2510,4500H/F	1	2018-11-07	7.91
Phenols	mg/L	SUBCONTRACT P-INORG	0.001	2018-11-07	0.007
			0.004	2018-11-07	
Se	mg/L	EPA 200.8	0.001	2018-11-07	<0.001
SO4	mg/L	SM 4110	1	2018-11-08	173
TDS (COND - CALC)	mg/L	C SM2540	1	2018-11-09	910
Total Kjeldahl Nitrogen	mg/L	SUBCONTRACT P-INORG	0.1	2018-11-08	
			0.2	2018-11-08	
			0.4	2018-11-08	
			1	2018-11-08	22.4
Total Suspended Solids	mg/L	C SM2540	2	2018-11-05	
				2018-11-07	33
V	mg/L	EPA 200.8	0.001	2018-11-07	0.003
Zn	mg/L	EPA 200.8	0.01	2018-11-07	0.02

Workorder No.: 1822586
Client: GFL Environmental Inc. (c/o Lascelles Eng.)
Address.: 870 James Street
City: Hawkesbury
Telephone: 613-836-3884
Contact: Shuang Chang
Date Received: 2018-12-17

Eurofins Environment Testing Canada Inc.

8-146 Colonnade Road, Ottawa, ON K2E 7Y1
Service Depots: Missisauga, Kingston, St. Catharines
Toll-free: 1-888-271-8378

Please refer to the accompanying digitally signed PDF version of the report for official results.

				LIMS #	1404461
				Sample ID	SWID1
				Sample Date	2018-12-17
Analyte	Units	Analytical Method	MRL	Analysis Date	
Ag	mg/L	EPA 200.8	0.0001	2018-12-19	<0.0001
Al (dissolved)	mg/L	EPA 200.8	0.01	2018-12-21	<0.01
Al (total)	mg/L	EPA 200.8	0.01	2018-12-19	0.7
Alkalinity as CaCO3	mg/L	SM2320,2510,4500H/F	5	2018-12-21	351
As	mg/L	EPA 200.8	0.001	2018-12-19	0.002
B	mg/L	EPA 200.8	0.01	2018-12-19	0.17
Ba	mg/L	EPA 200.8	0.01	2018-12-19	0.06
BOD5	mg/L	SM 5210B	1	2018-12-24	9
Ca	mg/L	M SM3120B-3500C	1	2018-12-18	138
Cd	mg/L	EPA 200.8	0.0001	2018-12-19	<0.0001
Cl	mg/L	SM 4110	1	2018-12-19	132
Co	mg/L	EPA 200.8	0.0002	2018-12-19	0.0015
CO3 as CaCO3	mg/L	SM 2320B	1	2018-12-21	N/A-PH
				2018-12-24	
COD	mg/L	C SM5220C	5	2018-12-21	39
Conductivity	uS/cm	SM2320,2510,4500H/F	5	2018-12-21	1440
Cr	mg/L	EPA 200.8	0.001	2018-12-19	0.002
Cu	mg/L	EPA 200.8	0.001	2018-12-19	0.004
Fe (dissolved)	mg/L	EPA 200.8	0.03	2018-12-21	0.09
Fe (total)	mg/L	EPA 200.8	0.03	2018-12-19	0.82
Filtration		EPA 200.8		2018-12-20	Y
Hardness as CaCO3	mg/L	C SM2340B	1	2018-12-21	489
				2018-12-24	
HCO3 as CaCO3	mg/L	SM 2320B	1	2018-12-21	351
				2018-12-24	
Hg Dissolved	mg/L	EPA 200.8	0.0001	2018-12-21	<0.0001
Hg Total	mg/L	EPA 200.8		2018-12-19	
			0.0001	2018-12-19	<0.0001
K	mg/L	M SM3120B-3500C	1	2018-12-18	22
Mg	mg/L	M SM3120B-3500C	1	2018-12-18	35
Na	mg/L	M SM3120B-3500C	2	2018-12-18	111
Ni	mg/L	EPA 200.8	0.005	2018-12-19	<0.005
N-NH3	mg/L	POINTECLAIRE	0.02	2018-12-20	2.19
N-NO2	mg/L	C SM4500-NO3-F	0.1	2018-12-21	<0.10
N-NO3	mg/L	C SM4500-NO3-F	0.1	2018-12-21	<0.10
P	mg/L	EPA 200.8	0.002	2018-12-19	0.063
			0.01	2018-12-21	
Pb	mg/L	EPA 200.8	0.001	2018-12-19	<0.001
pH		SM2320,2510,4500H/F	1	2018-12-21	7.97
Phenols	mg/L	SUBCONTRACT P-INORG	0.001	2018-12-19	<0.001
Se	mg/L	EPA 200.8	0.001	2018-12-19	<0.001
SO4	mg/L	SM 4110	1	2018-12-19	235
TDS (COND - CALC)	mg/L	C SM2540	1	2018-12-21	936
				2018-12-24	
Total Kjeldahl Nitrogen	mg/L	SUBCONTRACT P-INORG	0.1	2018-12-21	
			0.2	2018-12-21	5.2
			0.4	2018-12-21	
Total Suspended Solids	mg/L	C SM2540	2	2018-12-20	11
V	mg/L	EPA 200.8	0.001	2018-12-19	0.002
Zn	mg/L	EPA 200.8	0.01	2018-12-19	<0.01

SW1 2019-2020									
measured / estimated flow (L.sec)			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)	609	304.00	21.00	52.00
effluent discharge (L/sec)						50	50.00	0.00	0.00
Station		mg/L				SW1	SW1	SW1	SW1
Lab ID						1428321	1431594.00		
						2019-05-23	2019-06-06	2019-7-10	2019-8-8
Analyte	MRL	Effluent Limit							
1,2-dichloroethane-d4 (%)						95.00	100.00		
1,4-dichlorobenzene (µg/L)			4.00			<0.4	<0.4		
4-bromofluorobenzene (%)						115.00	116.00		
Ag (mg/L)						<0.0001	<0.0001		
Al (dissolved) (mg/L)	0.01					0.04	0.04		
Alkalinity as CaCO3 (mg/L)	5					223.00	208.00		
As (mg/L)	0.001					<0.001	<0.001		
B (mg/L)	0.01		0.2*	29/1.5	ND/1.2	0.560	0.960		
Ba (mg/L)	0.01					0.07	0.10		
Benzene (µg/L)			100.00	ND/370	ND/40	<0.5	<0.5		
Ca (mg/L)	1					85.00	84.00		
CBOD5 (mg/L)	1	10.0				4.00	2.00		
Cd (mg/L)	0.0001		0.00020	.001/.00009	calculation	<0.0001	<0.0001		
Cl (mg/L)	1			640/120	600/150	77.00	133.00		
Co (mg/L)	0.0002				0.110/0.004	0.0009	0.0013		
COD (mg/L)	5					45.00	58.00		
Conductivity (µmho/cm)	5					900.00	1430.00		
Cr (mg/L)	0.001		0.009	ND/.001		0.003	0.003		
Cu (mg/L)	0.001	0.2		ND/.004	0.029/≤0.002	0.0020	0.0020		
Dichloromethane (µg/L)			100.00	ND/9811		<4.0	<4.0		
DOC (mg/L)	0.50					19.90	24.10		
Fe (mg/L)	0.03	1.0	0.300	ND/0.3	0.001/ND	0.370	0.280		
Filtration						Y	Y		
Hardness as CaCO3 (mg/L)	1					290.00	321.00		
Hg (mg/L)	0.0001		0.00020	ND/.000026	ND/calculation	<0.0001	<0.0001		
K (mg/L)	1					25.00	48.00		
Mg (mg/L)	1					19.00	27.00		
Mn (mg/L)	0.01					0.05	0.07		
Na (mg/L)	2		180.00			82.00	152.00		
N-NH3 (mg/L)	0.02	1.0				0.250	0.087		
N-NH3 (Unionized - calculated) (mg/L)			0.0200						
N-NO2 (mg/L)	0.10				0.6/0.2	<0.10	<0.10		
N-NO3 (mg/L)	0.10			124/3.0	32.8/3.0	18.70	35.70		
P - Total (mg/L)	0.01	0.3	0.030			0.087	0.072		
Pb (mg/L)	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001		
pH						8.16	8.25		
Phenols (mg/L)	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001		
Se (mg/L)	0.001					<0.001	<0.001		
SO4 (mg/L)	1				429.00	70.00	122.00		
TDS (COND - CALC) (mg/L)	5					585.00	930.00		
Toluene (µg/L)			0.80	ND/.002	ND/0.0005	<0.5	<0.5		
Toluene-d8 (%)	0.0001					100.00	103.00		
Total Kjeldahl Nitrogen (mg/L)	0.10					2.00	1.65		
Total P - Soluble (mg/L)						0.05	0.05		
Total Suspended Solids (mg/L)	2	10.0				10.00	11.00		
Vinyl Chloride (µg/L)			600.00			<0.2	<0.2		
Zn (mg/L)	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.03	0.01		
Field Data									
Temperature (C)						12.50	21.50	25.70	24.10
pH						7.03	8.37	7.92	7.95
Conductivity (µmho/cm)						806.00	1533.00	480.00	523.00
Dissolved Oxygen (mg/L)		4.00				10.56	15.07	7.10	6.10
	Meets PWQO								
	Exceeds PWQO								
	Meets CCME or MOE BC long term guideline								
	Exceeds CCME or MOE BC long term guideline								

SW1 2019-2020		Est'd.	Est'd.	Est'd.	Est'd.		Est'd.	Est'd.
measured / estimated flow (L.sec)		36.00	38.00	30.00	39.00	61.00	63.00	57.00
effluent discharge (L/sec)		20.00	20.00	20.00	20.00	20.00	20.00	20.00
Station		SW1	SW1	SW1	SW1	SW1	SW1	SW1
Lab ID		B19-26597-4	B19-27095-1	B19-27537-1	B19-27824-1		B19-28281-1	B19-28725-1
		2019-8-23	2019-8-27	2019-8-30	2019-9-3	2019-9-4	2019-9-6	2019-9-10
Analyte	MRL							
1,2-dichloroethane-d4 (%)								
1,4-dichlorobenzene (µg/L)		< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
4-bromofluorobenzene (%)								
Ag (mg/L)								
Al (dissolved) (mg/L)	0.01							
Alkalinity as CaCO3 (mg/L)	5	241.00	256.00	190.00	192.00		263.00	301.00
As (mg/L)	0.001							
B (mg/L)	0.01	2.610	3.090	0.380	0.537		1.020	2.390
Ba (mg/L)	0.01	0.13	0.13	0.07	0.07		0.06	0.09
Benzene (µg/L)		< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Ca (mg/L)	1	90.10	76.40	63.20	69.90		54.90	76.10
CBOD5 (mg/L)	1	< 3	< 3	< 3	< 3		< 3	< 3
Cd (mg/L)	0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070		< 0.000070	< 0.000070
Cl (mg/L)	1	375.00	371.00	71.00	101.00		168.00	481.00
Co (mg/L)	0.0002							
COD (mg/L)	5	113.00	115.00	62.00	59.00		55.00	< 5
Conductivity (µmho/cm)	5	3010.00	3300.00	760.00	1010.00		1400.00	2900.00
Cr (mg/L)	0.001	0.006	0.005	0.004	0.003		0.003	0.008
Cu (mg/L)	0.001	0.0033	0.0054	0.0038	0.0032		0.0036	0.0068
Dichloromethane (µg/L)		< 5	< 5	< 5	< 5		< 0.5	< 5
DOC (mg/L)	0.50	20.70	33.80	18.40	17.60		14.40	33.30
Fe (mg/L)	0.03	0.957	0.825	1.630	1.630		1.210	1.050
Filtration								
Hardness as CaCO3 (mg/L)	1	449.00	457.00	237.00	262.00		252.00	412.00
Hg (mg/L)	0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002	< 0.00002
K (mg/L)	1	122.00	142.00	18.30	26.50		44.10	120.00
Mg (mg/L)	1	54.50	64.80	19.20	21.30		27.80	54.00
Mn (mg/L)	0.01	0.09	0.06	0.09	0.09		0.06	0.05
Na (mg/L)	2	436.00	476.00	69.60	88.40		176.00	377.00
N-NH3 (mg/L)	0.02	0.320	0.210	0.160	0.190		0.110	0.130
N-NH3 (Unionized - calculated) (mg/L)								
N-NO2 (mg/L)	0.10	<0.1	< 1	< 0.1	< 0.1		< 0.1	< 0.1
N-NO3 (mg/L)	0.10	124.00	102.00	12.70	20.90		29.80	74.50
P - Total (mg/L)	0.01	0.160	0.140	0.150	0.160		0.110	0.150
Pb (mg/L)	0.001	0.0003	0.0003	0.0020	0.0005		0.0004	0.0009
pH								
Phenols (mg/L)	0.001	<0.002	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002
Se (mg/L)	0.001							
SO4 (mg/L)	1	343.00	321.00	69.00	90.00		128.00	257.00
TDS (COND - CALC) (mg/L)	5	2114.00	2056.00	483.00	607.00		890.00	1876.00
Toluene (µg/L)		< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Toluene-d8 (%)	0.0001							
Total Kjeldahl Nitrogen (mg/L)	0.10	4.50	4.70	2.10	2.40		2.60	4.90
Total P - Soluble (mg/L)								
Total Suspended Solids (mg/L)	2	28.00	31.00	30.00	34.00		38.00	36.00
Vinyl Chloride (µg/L)		< 0.2	< 0.2	< 0.2	< 0.2		< 0.2	< 0.2
Zn (mg/L)	0.01	0.02	0.02	0.01	0.02		0.02	0.06
Field Data								
Temperature (C)						19.90		
pH						8.38		
Conductivity (µmho/cm)						1095.00		
Dissolved Oxygen (mg/L)						7.46		
	Meets PWQ							
	Exceeds P							
	Meets CCM							
	Exceeds C							

SW1 2019-2020						
measured / estimated flow (L.sec)		29.00	52.00	589.00	115.00	226.00
effluent discharge (L/sec)		0.00	10.00	10.00	10.00	10.00
Station		SW1	SW1	SW1	SW1	SW1
Lab ID		1459465.00	B19-33323-1	B19-33766-1	B19-34301-1	B19-34716-1
		2019-10-10	2019-10-15	2019-10-18	2019-10-22	2019-10-25
Analyte	MRL					
1,2-dichloroethane-d4 (%)		98.70				
1,4-dichlorobenzene (µg/L)		<0.4	< 0.5	< 0.5	< 0.5	< 0.5
4-bromofluorobenzene (%)		98.00				
Ag (mg/L)		<0.0001				
Al (dissolved) (mg/L)	0.01	<0.01				
Alkalinity as CaCO3 (mg/L)	5	204.00	267.00	148.00	203.00	196.00
As (mg/L)	0.001	<0.001				
B (mg/L)	0.01	0.080	1.610	0.165	0.459	0.325
Ba (mg/L)	0.01	0.06	0.09	0.09	0.08	0.10
Benzene (µg/L)		<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ca (mg/L)	1	79.00	78.50	99.00	84.70	110.00
CBOD5 (mg/L)	1	2.00	< 3	< 3	< 3	< 3
Cd (mg/L)	0.0001	<0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Cl (mg/L)	1	23.00	246.00	39.90	86.10	64.90
Co (mg/L)	0.0002	0.0012				
COD (mg/L)	5	27.00	26.00	51.00	46.00	63.00
Conductivity (µmho/cm)	5	532.00	2130.00	751.00	1100.00	973.00
Cr (mg/L)	0.001	0.004	0.005	0.003	0.003	0.003
Cu (mg/L)	0.001	0.0040	0.0025	0.0038	0.0030	0.0031
Dichloromethane (µg/L)		<4.0	< 5	< 5	< 5	< 5
DOC (mg/L)	0.50	12.90	18.70	16.60	16.00	15.70
Fe (mg/L)	0.03	2.000	1.270	1.180	1.010	0.996
Filtration		Y				
Hardness as CaCO3 (mg/L)	1	255.00	373.00	321.00	303.00	366.00
Hg (mg/L)	0.0001	<0.0001	< 0.00002	< 0.00002	0.00002	< 0.00002
K (mg/L)	1	5.00	81.90	12.40	26.20	19.40
Mg (mg/L)	1	14.00	42.90	17.80	22.30	22.20
Mn (mg/L)	0.01	0.12	0.06	0.08	0.05	0.05
Na (mg/L)	2	22.00	261.00	32.70	83.40	60.80
N-NH3 (mg/L)	0.02	0.099	0.170	0.170	0.200	0.170
N-NH3 (Unionized - calculated) (mg/L)		0.0034	0.0023	0.0003	0.0018	0.0012
N-NO2 (mg/L)	0.10	<0.10	< 0.1	< 0.1	< 0.1	< 0.1
N-NO3 (mg/L)	0.10	1.20	58.90	17.60	28.20	19.80
P - Total (mg/L)	0.01	0.113	0.060	0.110	0.090	0.060
Pb (mg/L)	0.001	<0.001	0.0004	0.0005	0.0003	0.0003
pH		8.43				
Phenols (mg/L)	0.001	<0.001	0.0030	< 0.002	< 0.002	< 0.002
Se (mg/L)	0.001	<0.001				
SO4 (mg/L)	1	45.00	154.00	112.00	113.00	114.00
TDS (COND - CALC) (mg/L)	5	346.00	1287.00	482.00	664.00	599.00
Toluene (µg/L)		<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene-d8 (%)	0.0001	92.00				
Total Kjeldahl Nitrogen (mg/L)	0.10	1.10	3.80	1.90	2.40	2.00
Total P - Soluble (mg/L)		0.03				
Total Suspended Solids (mg/L)	2	65.00	33.00	32.00	20.00	3.00
Vinyl Chloride (µg/L)		<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Zn (mg/L)	0.01		0.03	0.01	0.01	0.01
Field Data						
Temperature (C)		9.60			9.90	8.20
pH		8.30	8.20	8.80	7.69	7.65
Conductivity (µmho/cm)		514.00	7.86	6.98		
Dissolved Oxygen (mg/L)		10.53				
	Meets PWQ					
	Exceeds P					
	Meets CCM					
	Exceeds C					

SW1 2019-2020								
measured / estimated flow (L.sec)		716.00	364.00	985.00	339.00	44.00	10.00	189.60
effluent discharge (L/sec)		10.00	10.00	50.00	50.00	50.00	50.00	50.00
Station		SW1	SW1	SW1	SW1	SW1	SW1	SW1
Lab ID		B19-35135-1	B19-35418-1	1464899.00	1471804.00	1475057.00	1480013.00	1485309.00
		2019-10-29	2019-10-31	2019-11-06	2019-12-11	2020-01-10	2020-02-14	2020-03-17
Analyte	MRL							
1,2-dichloroethane-d4 (%)						99.00		
1,4-dichlorobenzene (µg/L)		< 0.5	< 0.5			<0.4		
4-bromofluorobenzene (%)						98.00		
Ag (mg/L)				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.01			0.04	0.08	0.06	0.01	0.02
Alkalinity as CaCO3 (mg/L)	5	177.00	194.00	215.00	223.00	246.00	193.00	174.00
As (mg/L)	0.001			<0.001	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.01	0.125	0.184	0.320	0.930	1.700	1.820	0.100
Ba (mg/L)	0.01	0.09	0.09	0.08	0.10	0.13	0.14	0.04
Benzene (µg/L)		< 0.5	< 0.5			<0.5		
Ca (mg/L)	1	107.00	101.00	111.00	94.00	107.00	78.00	70.00
CBOD5 (mg/L)	1	< 3	< 3	<1	3.00	2.00	5.00	7.00
Cd (mg/L)	0.0001	< 0.000070	< 0.000070	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	1	39.90	40.70	59.00	137.00	194.00	212.00	24.00
Co (mg/L)	0.0002			0.0006	0.0012	0.0017	0.0015	0.0005
COD (mg/L)	5	48.00	47.00	35.00	46.00	76.00	72.00	43.00
Conductivity (µmho/cm)	5	754.00	797.00	967.00	1460.00	1920.00	1980.00	508.00
Cr (mg/L)	0.001	0.001	0.002	0.001	0.004	0.007	0.005	0.001
Cu (mg/L)	0.001	0.0037	0.0055	0.0020	0.0020	0.0020	0.0020	0.0030
Dichloromethane (µg/L)		< 5	< 5			<4.0		
DOC (mg/L)	0.50	14.40	14.40	15.70	22.60	26.40	29.20	12.70
Fe (mg/L)	0.03	0.667	0.747	0.320	0.430	0.540	0.360	0.610
Filtration				Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)	1	340.00	326.00	360.00	350.00	415.00	347.00	212.00
Hg (mg/L)	0.0001	< 0.00002	0.00003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	1	9.60	10.10	15.00	43.00	62.00	74.00	4.00
Mg (mg/L)	1	17.70	18.00	20.00	28.00	36.00	37.00	9.00
Mn (mg/L)	0.01	0.04	0.04	0.04	0.06	0.06	0.06	0.07
Na (mg/L)	2	30.00	35.00	54.00	133.00	190.00	233.00	23.00
N-NH3 (mg/L)	0.02	0.170	0.200	0.035	0.310	0.405	0.245	0.513
N-NH3 (Unionized - calculated) (mg/L)		0.0001	0.0002	0.0006	0.0027	0.0318	0.0027	0.0047
N-NO2 (mg/L)	0.10	< 0.1	< 0.1	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)	0.10	13.40	11.00	20.20	50.40	76.80	93.40	5.30
P - Total (mg/L)	0.01	0.070	0.070	0.066	0.155	0.110	0.082	0.213
Pb (mg/L)	0.001	0.0003	0.0003	<0.001	<0.001	<0.001	<0.001	<0.001
pH				8.34	8.03	7.96	8.10	7.95
Phenols (mg/L)	0.001	0.0010	< 0.002	<0.001	<0.001	0.0050	0.0040	0.0030
Se (mg/L)	0.001			<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	1	102.00	111.00	104.00	115.00	111.00	93.00	43.00
TDS (COND - CALC) (mg/L)	5	472.00	482.00	629.00	949.00	1250.00	1290.00	330.00
Toluene (µg/L)		< 0.5	< 0.5			<0.5		
Toluene-d8 (%)	0.0001					105.00		
Total Kjeldahl Nitrogen (mg/L)	0.10	1.70	1.60	1.25	2.20	3.50	3.76	1.90
Total P - Soluble (mg/L)				0.04	0.08	0.04	0.03	0.13
Total Suspended Solids (mg/L)	2	10.00	18.00	16.00	20.00	21.00	16.00	22.00
Vinyl Chloride (µg/L)		< 0.2	< 0.2			<0.2		
Zn (mg/L)	0.01	0.01	0.01	<0.01	0.01	0.02	0.02	<0.01
Field Data								
Temperature (C)		10.90	12.70	6.60	0.21	0.00	-0.30	1.00
pH		6.52	6.65	8.12	8.03	9.02	8.15	8.02
Conductivity (µmho/cm)				938.00	1481.00	43.00	60.00	489.00
Dissolved Oxygen (mg/L)				11.57	frozen meter	9.94	13.05	11.67
	Meets PWQ	Meets PWQO						
	Exceeds P	Exceeds PWQO						
	Meets CCM	Meets CCME or MOE BC long term guideline						
	Exceeds C	Exceeds CCME or MOE BC long term guideline						

SW1 2019-2020						
measured / estimated flow (L.sec)		1408.00	262.90	190.10	301.60	512.70
effluent discharge (L/sec)		50.00	50.00	50.00	50.00	50.00
Station		SW1	SW1	SW1	SW1	SW1
Lab ID		1487982.00	1492671.00	1493684.00	1507641.00	1508116.00
		2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04
Analyte	MRL					
1,2-dichloroethane-d4 (%)		111.00			103.00	
1,4-dichlorobenzene (µg/L)		<0.4			<0.4	
4-bromofluorobenzene (%)		105.00			90.00	
Ag (mg/L)		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.01	0.02	0.09	0.16	0.39	0.21
Alkalinity as CaCO3 (mg/L)	5	182.00	227.00	260.00	131.00	224.00
As (mg/L)	0.001	<0.001	<0.001	<0.001	0.00	0.00
B (mg/L)	0.01	0.210	0.920	0.970	0.750	0.590
Ba (mg/L)	0.01	0.05	0.08	0.07	0.07	0.07
Benzene (µg/L)		<0.5			<0.5	
Ca (mg/L)	1	76.00	74.00	68.00	69.00	92.00
CBOD5 (mg/L)	1	1.00	1.00	4.00	6.00	4.00
Cd (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	1	42.00	137.00	134.00	96.00	78.00
Co (mg/L)	0.0002	0.0005	0.0013	0.0015	0.0015	0.0011
COD (mg/L)	5	46.00	68.00	63.00	74.00	63.00
Conductivity (µmho/cm)	5	657.00	1420.00	1460.00	1140.00	1080.00
Cr (mg/L)	0.001	0.001	0.003	0.003	0.003	0.003
Cu (mg/L)	0.001	0.0020	0.0020	0.0030	0.0040	0.0040
Dichloromethane (µg/L)		<4.0			<4.0	
DOC (mg/L)	0.50	14.70	26.90	27.30	27.50	25.00
Fe (mg/L)	0.03	0.510	0.380	0.400	0.980	0.670
Filtration			Y	Y	Y	Y
Hardness as CaCO3 (mg/L)	1	243.00	300.00	269.00	255.00	329.00
Hg (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	1	9.00	48.00	43.00	35.00	29.00
Mg (mg/L)	1	13.00	28.00	24.00	20.00	24.00
Mn (mg/L)	0.01	0.06	0.07	0.08	0.07	0.05
Na (mg/L)	2	38.00	159.00	153.00	110.00	95.00
N-NH3 (mg/L)	0.02	0.087	0.010	0.036	0.714	0.188
N-NH3 (Unionized - calculated) (mg/L)		0.0000	0.0003	0.0001	0.0037	0.0420
N-NO2 (mg/L)	0.10	<0.10	<0.10	<0.10	0.17	<0.10
N-NO3 (mg/L)	0.10	13.00	45.70	46.50	32.60	25.10
P - Total (mg/L)	0.01	0.073	0.071	0.060	0.235	0.168
Pb (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH		7.80	8.29	8.31	7.31	7.97
Phenols (mg/L)	0.001	<0.001	0.0050	0.0050	0.0020	0.0060
Se (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	1	56.00	101.00	103.00	142.00	114.00
TDS (COND - CALC) (mg/L)	5	427.00	923.00	949.00	741.00	702.00
Toluene (µg/L)		<0.5			<0.5	
Toluene-d8 (%)	0.0001	100.00			103.00	
Total Kjeldahl Nitrogen (mg/L)	0.10	2.50	3.44	3.46	3.90	3.20
Total P - Soluble (mg/L)		0.02	0.02	0.03	0.07	0.08
Total Suspended Solids (mg/L)	2	15.00	35.00	44.00	53.00	53.00
Vinyl Chloride (µg/L)		<0.2			<0.2	
Zn (mg/L)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data						
Temperature (C)		4.80	8.10	8.80	21.24	19.90
pH		6.05	8.29	7.09	7.08	8.87
Conductivity (µmho/cm)		652.00	1409.00	1402.00	1070.00	1013.00
Dissolved Oxygen (mg/L)		15.00	10.46	12.33	6.50	4.10
	Meets PWQ					
	Exceeds P					
	Meets CCM					
	Exceeds C					

SW1 2019-2020					
measured / estimated flow (L.sec)		118.40	93.88	316.81	479.70
effluent discharge (L/sec)		12.00			
Station		SW1	SW1	SW1	SW1
Lab ID		1513025.00	1521854.00	1526414.00	1533866.00
		2020-8-26	2020-10-13	2020-11-03	2020-12-09
Analyte	MRL				
1,2-dichloroethane-d4 (%)				140.00	
1,4-dichlorobenzene (µg/L)				<0.4	
4-bromofluorobenzene (%)				104.00	
Ag (mg/L)		<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.01	0.09	0.41	0.03	0.04
Alkalinity as CaCO3 (mg/L)	5	242.00	239.00	275.00	237.00
As (mg/L)	0.001	0.00	<0.001	<0.001	<0.001
B (mg/L)	0.01	0.850	0.100	0.750	0.680
Ba (mg/L)	0.01	0.08	0.07	0.08	0.09
Benzene (µg/L)				<0.5	
Ca (mg/L)	1	81.00	92.00	105.00	116.00
CBOD5 (mg/L)	1	5.00	7.00	3.00	4.00
Cd (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	1	102.00	20.00	111.00	140.00
Co (mg/L)	0.0002	0.0012	0.0005	0.0012	0.0011
COD (mg/L)	5	59.00	27.00	44.00	53.00
Conductivity (µmho/cm)	5	1290.00	634.00	1390.00	1430.00
Cr (mg/L)	0.001	0.003	0.002	0.002	0.003
Cu (mg/L)	0.001	0.0030	0.0020	0.0020	0.0020
Dichloromethane (µg/L)				<4.0	
DOC (mg/L)	0.50	22.00	11.10	18.30	18.90
Fe (mg/L)	0.03	0.630	0.850	0.310	0.290
Filtration		Y	Y	Y	Y
Hardness as CaCO3 (mg/L)	1	301.00	291.00	369.00	409.00
Hg (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	1	37.00	4.00	36.00	38.00
Mg (mg/L)	1	24.00	15.00	26.00	29.00
Mn (mg/L)	0.01	0.06	0.11	0.04	0.06
Na (mg/L)	2	125.00	19.00	128.00	118.00
N-NH3 (mg/L)	0.02	0.160	0.024	0.157	0.150
N-NH3 (Unionized - calculated) (mg/L)		0.0005	0.0024	0.0002	0.0000
N-NO2 (mg/L)	0.10	0.16	<0.10	<0.50	<0.10
N-NO3 (mg/L)	0.10	32.90	0.86	44.50	52.10
P - Total (mg/L)	0.01	0.271	0.084	0.073	0.066
Pb (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001
pH		8.09	8.14	8.19	8.27
Phenols (mg/L)	0.001	0.0030	0.0040	<0.001	0.0020
Se (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	1	121.00	70.00	110.00	125.00
TDS (COND - CALC) (mg/L)	5	838.00	412.00	904.00	930.00
Toluene (µg/L)				<0.5	
Toluene-d8 (%)	0.0001			101.00	
Total Kjeldahl Nitrogen (mg/L)	0.10	3.30	0.96	2.27	2.92
Total P - Soluble (mg/L)		0.14	0.09	0.04	0.05
Total Suspended Solids (mg/L)	2	47.00	51.00	18.00	42.00
Vinyl Chloride (µg/L)				<0.2	
Zn (mg/L)	0.01	<0.01	<0.01	<0.01	0.01
Field Data					
Temperature (C)		15.40	9.60	1.55	0.30
pH		7.05	8.56	7.03	6.56
Conductivity (µmho/cm)		1228.00	1318.00	1246.00	1313.00
Dissolved Oxygen (mg/L)		6.59	8.47	10.27	13.45
	Meets PWQ				
	Exceeds P				
	Meets CCM				
	Exceeds C				

	A	B	C	D	E	F	G	H	I	J
1	**SW2 2019-2020**			**PWQO (APV for Cl and Na)**	**CCME Surface Water Quality Guideline - Short/Long Term (mg/L)**	**Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)**				
2	**measured / estimated flow**						**NA**	**NA**	**153.00**	**60.00**
3	**effluent discharge (L/sec)**						**0.00**	**50.00**	**50.00**	**50.00**
4	**Station**		**Regulated**				**SW2**	**SW2**	**SW2**	**SW2**
5	**LAB ID:**		**Effluent**				**B19-06572**	**B19-12565**	**1428323.00**	**1431590.00**
6			**Parameter**				**2019-03-11**	**2019-05-08**	**2019-05-23**	**2019-06-06**
7	**Analyte**	MRL	**mg/L**							
8	1,2-dichloroethane-d4 (%)								101.00	100.00
9	1,4-dichlorobenzene (µg/L)			4.00			< 0.5	< 0.5	<0.4	<0.4
10	4-bromofluorobenzene (%)								90.00	120.00
11	Ag (mg/L)	0.0001							<0.0001	<0.0001
12	Al (dissolved) (mg/L)	0.01							0.09	0.10
13	Alkalinity as CaCO3 (n	5					244.00	199.00	275.00	245.00
14	As (mg/L)	0.001							0.00	0.00
15	B (mg/L)	0.01		0.2*	29/1.5	ND/1.2	2.53	NA	1.82	2.70
16	Ba (mg/L)	0.01					0.25	0.15	0.12	0.21
17	Benzene (µg/L)			100.00	ND/370	ND/40				
18	Ca (mg/L)	1					46.30	85.30	94.00	105.00
19	CBOD5 (mg/L)	1	10.0				< 0.5	< 0.5	<0.5	<0.5
20	Cd (mg/L)	0.0001		0.0002	.001/.00009	calculation	< 0.000070	< 0.000070	<0.0001	<0.0001
21	Cl (mg/L)	1			640/120	600/150	406.00	206.00	251.00	384.00
22	Co (mg/L)	0.0002				0.110/0.004			0.0023	0.0037
23	COD (mg/L)	5					106.00	96.00	93.00	113.00
24	Conductivity (µmho/cm	5					2950.00	1830.00	2100.00	3200.00
25	Cr (mg/L)	0.001		0.0089	ND/.001		0.0080	0.0070	0.0070	0.0080
26	Cu (mg/L)	0.001	0.2		ND/.004	0.029/≤0.002	0.0045	0.0059	0.0020	0.0020
27	Dichloromethane (µg/L)			100.00	ND/9811		< 5	< 5	<4.0	<4.0
28	DOC (mg/L)	0.50					35.50	31.90	34.10	43.50
29	Fe (mg/L)	0.03	1.0	0.30	ND/0.3	0.001/ND	0.23	1.27	0.16	0.15
30	Filtration								Y	Y
31	Hardness as CaCO3 (	1							412.00	509.00
32	Hg (mg/L)	0.0001		0.00020	ND/.000026	ND/calculation	0.00003	< 0.00002	0.00010	0.00010
33	K (mg/L)	1					113.00	74.90	97.00	153.00
34	Mg (mg/L)	1					47.10	41.50	43.00	60.00
35	Mn (mg/L)	0.01					0.03	0.13	0.04	0.04
36	Na (mg/L)	2		180.00			391.00	241.00	309.00	441.00
37	N-NH3 (mg/L)	0.02	1.0				0.77	0.71	0.70	0.19
38	N-NH3 (Unionized - calculated) (mg/L)			0.0200			<0.2	0.0015		
39	N-NO2 (mg/L)	0.10				0.6/0.2	< 1	< 0.1	<0.10	<0.10
40	N-NO3 (mg/L)	0.10			124/3.0	32.8/3.0	140.00	70.70	95.80	100.00
41	P - Total (mg/L)	0.01	0.3	0.030			0.250	0.230	0.211	0.162
42	Pb (mg/L)	0.001		0.0250	ND/.007	0.003/ND	0.0009	0.0008	<0.001	<0.001
43	pH								8.28	8.30
44	Phenols (mg/L)	0.001	0.005	0.0010	ND/0.004	.050/ND	< 0.002	< 0.002	<0.001	<0.001
45	Se (mg/L)	0.001							<0.001	<0.001
46	SO4 (mg/L)	1				429.00	134.00	137.00	159.00	314.00
47	TDS (COND - CALC) (	5					1905.00	1221.00	1360.00	2240.00
48	Toluene (µg/L)			0.80	ND/.002	ND/0.0005	< 0.5	< 0.5	<0.5	<0.5
49	Toluene-d8 (%)								99.00	105.00
50	Total Kjeldahl Nitroger	0.10					1.80	5.30	3.30	3.39
51	Total P - Soluble (mg/L)								0.16	0.12
52	Total Suspended Solid	2	10.0				7.00	14.00	7.00	13.00
53	Vinyl Chloride (µg/L)			600.00			< 0.2	< 0.2	<0.2	<0.2
54	Zn (mg/L)	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.04	0.03	0.02	0.03
55	Chromium (mg/L)						0.01	0.01		
56										
57	**Field Data**									
58	Temperature (C)						0.70	1.80	13.80	19.40
59	pH						8.10	7.27	7.94	8.21
60	Conductivity (µmho/cm)						1795.00	634.00	1912.00	3477.00
61	Dissolved Oxygen (mg/L)		4				9.76	10.16	12.13	18.22
62		**Meets PWQO**								
63		**Exceeds PWQO**								
64		**Meets CCME or MOE BC long term guideline**								
65		**Exceeds CCME or MOE BC long term guideline**								

	A	K	L	M	N	O	P	Q	R	S
1	**SW2 2019-2020**			**Est'd**	**Est'd**	**Est'd**	**Est'd**		**Est'd**	**Est'd**
2	**measured / estimated**	**0.70**	**0.00**	**44.00**	**41.00**	**21.00**	**17.00**	**3.90**	**ND**	**25.00**
3	**effluent discharge (L/**	**0.00**	**0.00**	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**
4	**Station**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**
5	**LAB ID:**			**B19-26597**	**B19-27095**	**B19-27537**	**B19-27824**		**B19-28281**	**B19-28725**
6		**2019-7-10**	**2019-8-8**	**2019-8-23**	**2019-8-27**	**2019-8-30**	**2019-9-3**	**2019-9-4**	**2019-9-6**	**2019-9-10**
7	**Analyte**									
8	1,2-dichloroethane-d4 (									
9	1,4-dichlorobenzene (µ			< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
10	4-bromofluorobenzene									
11	Ag (mg/L)									
12	Al (dissolved) (mg/L)									
13	Alkalinity as CaCO3 (n			301.00	302.00	298.00	284.00		392.00	432.00
14	As (mg/L)									
15	B (mg/L)			5.23	5.30	4.89	4.68		2.53	5.05
16	Ba (mg/L)			0.18	0.16	0.14	0.16		0.06	0.13
17	Benzene (µg/L)									
18	Ca (mg/L)			100.00		66.90	98.70		32.30	85.00
19	CBOD5 (mg/L)			< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
20	Cd (mg/L)			< 0.000070	< 0.000070	< 0.000070	< 0.000070		< 0.000070	< 0.000070
21	Cl (mg/L)			780.00	697.00	976.00	725.00		415.00	1080.00
22	Co (mg/L)				80.4000					
23	COD (mg/L)			177.00	151.00	147.00			85.00	172.00
24	Conductivity (µmho/cm			5570.00	5220.00	5090.00	5230.00		2900.00	5380.00
25	Cr (mg/L)			0.0080	0.0070	0.0060	0.0080		0.0030	0.0110
26	Cu (mg/L)			0.0036	0.0067	0.0063	0.0031		0.0041	0.0086
27	Dichloromethane (µg/L			< 5	< 5	< 5	< 5		< 5	< 5
28	DOC (mg/L)			19.40	40.00	17.50	17.60		14.50	45.80
29	Fe (mg/L)			0.08	0.06	0.05	0.12		0.15	0.10
30	Filtration									
31	Hardness as CaCO3 (			657.00						
32	Hg (mg/L)			< 0.00002	< 0.00002	0.00004			< 0.00002	< 0.00002
33	K (mg/L)			247.00	247.00	254.00	237.00		109.00	249.00
34	Mg (mg/L)			99.00	102.00	96.10	90.50		50.00	101.00
35	Mn (mg/L)			0.01	0.01	0.01	0.02		0.01	0.01
36	Na (mg/L)			907.00	836.00	830.00	815.00		417.00	897.00
37	N-NH3 (mg/L)			0.39	0.25	0.30	0.32		0.14	0.18
38	N-NH3 (Unionized - ca									
39	N-NO2 (mg/L)			< 0.1	< 1	< 0.1	< 1		< 0.1	< 1
40	N-NO3 (mg/L)			< 0.1	189.00	287.00			51.90	210.00
41	P - Total (mg/L)			0.090	0.080	0.140	0.200		0.080	0.130
42	Pb (mg/L)			0.0001	0.0001	< 0.0001	0.0002		0.0002	0.0002
43	pH									
44	Phenols (mg/L)			< 0.002	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002
45	Se (mg/L)									
46	SO4 (mg/L)			732.00	606.00	781.00	620.00		282.00	542.00
47	TDS (COND - CALC) (			3046.00	3589.00	4454.00	3736.00		1770.00	4146.00
48	Toluene (µg/L)			< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
49	Toluene-d8 (%)									
50	Total Kjeldahl Nitrogen			7.00	6.30	5.20	7.60		3.70	8.20
51	Total P - Soluble (mg/L									
52	Total Suspended Solid			14.00	10.00	12.00	14.00		9.00	11.00
53	Vinyl Chloride (µg/L)			< 0.2	< 0.2	< 0.2	< 0.2		< 0.2	< 0.2
54	Zn (mg/L)			0.04	0.03	0.03	0.05		0.01	0.06
55	Chromium (mg/L)									
56										
57	**Field Data**									
58	Temperature (C)	28.80	23.20	23.80	21.50	19.20	20.10	20.60	18.50	17.50
59	pH	9.40	8.04	7.89	8.33	8.40	8.10	8.30	8.41	8.08
60	Conductivity (µmho/cm	422.00	970.00					1875.00		
61	Dissolved Oxygen (mg	13.60	4.93					7.12		
62										
63										
64										
65										

	A	T	U	V	W	X	Y	Z	AA	AB
1	**SW2 2019-2020**		**Est'd**		**Est'd.**		**Est'd.**			
2	**measured / estimated**	**3.00**	**7.10**	**98.00**	**14.00**	**15.00**	**93.00**	**77.00**	**206.00**	**129.00**
3	**effluent discharge (L/**	**0.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**50.00**	**50.00**
4	**Station**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**	**SW2**
5	**LAB ID:**	**1459461.00**	**B19-33323-2**	**B19-33766-2**	**B19-34301-2**	**B19-34716-2**	**B19-35135-2**	**B19-35418-2**	**1464895.00**	**1471805.00**
6		**2019-10-10**	**2019-10-15**	**2019-10-18**	**2019-10-22**	**2019-10-25**	**2019-10-29**	**2019-10-31**	**2019-11-06**	**2019-12-11**
7	**Analyte**									
8	1,2-dichloroethane-d4 (	98.20								
9	1,4-dichlorobenzene (µ	<0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
10	4-bromofluorobenzene	99.00								
11	Ag (mg/L)	<0.0001							<0.0001	<0.0001
12	Al (dissolved) (mg/L)	0.02							0.09	0.21
13	Alkalinity as CaCO3 (n	219.00	413.00	148.00	264.00	222.00	167.00	198.00	255.00	256.00
14	As (mg/L)	<0.001							0.00	0.00
15	B (mg/L)	0.51	4.66	0.62	2.09	1.36	0.45	0.70	1.60	2.38
16	Ba (mg/L)	0.05	0.14	0.06	0.11	0.10	0.08	0.08	0.10	0.17
17	Benzene (µg/L)									
18	Ca (mg/L)	89.00	103.00	73.40	86.20	98.30	95.80	92.30	112.00	110.00
19	CBOD5 (mg/L)	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
20	Cd (mg/L)	<0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	<0.0001	<0.0001
21	Cl (mg/L)	103.00	689.00	118.00	366.00	247.00	107.00	129.00	222.00	371.00
22	Co (mg/L)	0.0011							0.0018	0.0030
23	COD (mg/L)	35.00	177.00	112.00	98.00	93.00	71.00	69.00	82.00	104.00
24	Conductivity (µmho/cm	1050.00	5170.00	1130.00	2880.00	2160.00	1110.00	1350.00	2270.00	3030.00
25	Cr (mg/L)	0.0030	0.0120	0.0030	0.0060	0.0040	0.0020	0.0020	0.0050	0.0090
26	Cu (mg/L)	0.0020	0.0034	0.0042	0.0049	0.0033	0.0064	0.0058	0.0020	0.0020
27	Dichloromethane (µg/L	<4.0	< 5	< 5	< 5	< 5	< 5	< 5		
28	DOC (mg/L)	14.80	53.20	20.30	18.50	28.60	20.50	25.20	34.00	44.40
29	Fe (mg/L)	0.82	0.28	0.70	0.39	0.36	0.44	0.30	0.16	0.30
30	Filtration	Y							Y	Y
31	Hardness as CaCO3 (	305.00	653.00	270.00	422.00	409.00	339.00	340.00	461.00	514.00
32	Hg (mg/L)	<0.0001	< 0.00002	0.00005	< 0.00002	0.00004	< 0.00002	< 0.00002	<0.0001	<0.0001
33	K (mg/L)	27.00	240.00	37.50	115.00	77.20	30.00	37.80	79.00	122.00
34	Mg (mg/L)	20.00	96.30	21.10	50.30	39.60	24.10	26.70	44.00	58.00
35	Mn (mg/L)	0.02	0.01	0.04	0.02	0.02	0.04	0.03	0.02	0.06
36	Na (mg/L)	97.00	785.00	112.00	354.00	239.00	102.00	127.00	236.00	336.00
37	N-NH3 (mg/L)	0.04	0.24	0.25	0.27	0.31	0.38	0.27	0.06	0.31
38	N-NH3 (Unionized - ca	0.0016	0.0069	0.0009	0.0031	0.0024	0.0005	0.0018	0.0006	0.0028
39	N-NO2 (mg/L)	<0.10	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.10	<0.10
40	N-NO3 (mg/L)	18.20	255.00	33.00	137.00	83.90	23.10	30.70	77.40	136.00
41	P - Total (mg/L)	0.106	0.080	0.170	0.120	0.100	0.180	0.170	0.217	0.316
42	Pb (mg/L)	<0.001	0.0002	0.0005	0.0002	0.0003	0.0004	0.0002	<0.001	<0.001
43	pH	8.44							8.35	7.96
44	Phenols (mg/L)	0.0020	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.002	<0.001	0.0050
45	Se (mg/L)	<0.001							<0.001	<0.001
46	SO4 (mg/L)	82.00	372.00	120.00	246.00	202.00	141.00	170.00	211.00	235.00
47	TDS (COND - CALC) (	682.00	3665.00	718.00	1984.00	1408.00	703.00	838.00	1480.00	1970.00
48	Toluene (µg/L)	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
49	Toluene-d8 (%)	95.00								
50	Total Kjeldahl Nitrogen	1.09	7.40	2.90	4.60	3.90	3.00	2.90	1.71	
51	Total P - Soluble (mg/L	0.07							0.17	0.15
52	Total Suspended Solid	22.00	16.00	22.00	11.00	33.00	9.00	9.00	12.00	20.00
53	Vinyl Chloride (µg/L)	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		
54	Zn (mg/L)	<0.01	0.05	0.01	0.02	0.02	0.01	0.01	0.02	0.03
55	Chromium (mg/L)									
56										
57	**Field Data**									
58	Temperature (C)	9.40	10.40	8.20	10.30	8.30	8.40	11.90	5.30	0.48
59	pH	8.32	8.35	7.53	7.92	7.95	7.25	7.63	7.88	8.03
60	Conductivity (µmho/cm	948.00							2184.00	160.00
61	Dissolved Oxygen (mg	13.94							11.40	meter frozen
62										
63										
64										
65										

	A	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1	**SW2 2019-2020**									
2	**measured / estimated**	**54.50**		**1.50**		**392.70**	**286.50**		**78.60**	**56.80**
3	**effluent discharge (L/**	**50.00**		**50.00**		**50.00**	**50.00**		**50.00**	**50.00**
4	**Station**	**SW2**	**SW-2**	**SW2**	**SW-2**	**SW2**	**SW2**	**SW2**	**SW-2**	**SW-2**
5	**LAB ID:**	**1475059**		**1480020**		**1485311**	**1487984**		**1492673**	**1493686**
6		**2020-01-10**	**2020-01-22**	**2020-02-14**	**2020-03-16**	**2020-03-17**	**2020-04-07**	**02020-05-02**	**2020-05-08**	**2020-05-14**
7	**Analyte**									
8	1,2-dichloroethane-d4 (	89.00					108.00			
9	1,4-dichlorobenzene (µ	<0.4	< 0.5		< 0.5		<0.4	< 0.5		
10	4-bromofluorobenzene	100.00					107.00			
11	Ag (mg/L)	<0.0001		<0.0001		<0.0001	<0.0001		<0.0001	<0.0001
12	Al (dissolved) (mg/L)	0.13		0.12		0.02	0.03		0.44	0.35
13	Alkalinity as CaCO3 (n	8.00	175.00	207.00	128	159.00	190.00	223.00	301.00	349.00
14	As (mg/L)	0.00		0.00		<0.001	0.00		0.00	0.00
15	B (mg/L)	4.60	4.22	7.10	0.333	0.11	0.88	1.11	2.67	2.73
16	Ba (mg/L)	0.27	0.25	0.41	0.046	0.03	0.08	0.08	0.15	0.12
17	Benzene (µg/L)		< 0.5		< 0.5			< 0.5		
18	Ca (mg/L)	98.00	71.30	67.00	59.3	66.00	75.00	69.10	65.00	62.00
19	CBOD5 (mg/L)	<0.5	< 3		< 3		<0.5	< 3		
20	Cd (mg/L)	<0.0001	< 0.000070	<0.0001	< 0.000070	<0.0001	<0.0001	< 0.000070	<0.0001	<0.0001
21	Cl (mg/L)	639.00	635.00	851.00	72.5	48.00	117.00	186.00	390.00	360.00
22	Co (mg/L)	0.0048		0.0059		0.0004	0.0010		0.0037	0.0035
23	COD (mg/L)	206.00	102.00	250.00	58	56.00	63.00	87.00	133.00	110.00
24	Conductivity (µmho/cm	8.00	4400.00	6080.00	744	592.00	1300.00	1710.00	3310.00	3090.00
25	Cr (mg/L)	0.0140	0.007	0.0160	0.0030	<0.001	0.0030	0.0040	0.0080	0.0070
26	Cu (mg/L)	0.0020	0.0035	0.0020		0.0020	0.0020		0.0030	0.0040
27	Dichloromethane (µg/L	<4.0	< 5		< 5		<4.0	< 5		
28	DOC (mg/L)	66.70	34.50	106.00	20	13.40	24.60	27.00	49.50	44.40
29	Fe (mg/L)	0.27	0.10	0.26	0.662	0.37	0.45	0.25	0.23	0.15
30	Filtration	Y		Y		Y			Y	Y
31	Hardness as CaCO3 (	603.00		620.00		206.00	286.00		418.00	357.00
32	Hg (mg/L)	<0.0001	< 0.00002	0.00010	< 0.00002	<0.0001	<0.0001	< 0.00002	<0.0001	<0.0001
33	K (mg/L)	211.00	230.00	323.00	17.9	6.00	36.00	57.30	144.00	117.00
34	Mg (mg/L)	87.00	87.90	110.00	14.4	10.00	24.00	32.90	62.00	49.00
35	Mn (mg/L)	0.03	0.04	0.05	0.076	0.09	0.04	0.03	0.04	0.03
36	Na (mg/L)	598.00	634.00	1020.00	62.6	38.00	130.00	197.00	537.00	442.00
37	N-NH3 (mg/L)	0.94	1.58	2.64	1.14	1.33	0.95	0.57	0.10	0.13
38	N-NH3 (Unionized - ca	0.0204		0.0005	<0.2	0.0119	0.0015	0.0091	0.0037	0.0005
39	N-NO2 (mg/L)	0.200	< 1	<0.10	< 1	<0.10	<0.10	< 1	<0.10	<0.10
40	N-NO3 (mg/L)	201.00	270.00	395.00		5.79	47.90		139.00	111.00
41	P - Total (mg/L)	0.250	0.25	0.215	0.43	0.545	0.180	0.09	0.140	0.110
42	Pb (mg/L)	<0.001	0.001	<0.001	0.0004	<0.001	<0.001	0.0001	<0.001	<0.001
43	pH	8.03		7.96		7.81	7.99		8.43	8.41
44	Phenols (mg/L)	0.0150	< 0.002	0.0120	< 0.002	0.0070	0.0020	< 0.002	0.0040	<0.001
45	Se (mg/L)	<0.001		<0.001		<0.001	<0.001		<0.001	<0.001
46	SO4 (mg/L)	225.00	199.00	237.00	52	48.00	96.00	152.00	233.00	229.00
47	TDS (COND - CALC) (	5.00	3162.00	3950.00	448	385.00	845.00	1070.00	2150.00	2010.00
48	Toluene (µg/L)	<0.5	< 0.5		< 0.5		<0.5	< 0.5		
49	Toluene-d8 (%)	107.00					103.00			
50	Total Kjeldahl Nitrogen	10.50	5.90	13.40	3.6	3.09	5.86	3.60	6.93	9.14
51	Total P - Soluble (mg/L	0.12		0.12		0.32	0.08		0.06	0.07
52	Total Suspended Solid	10.00	18.00	8.00	14	21.00	18.00	11.00	25.00	36.00
53	Vinyl Chloride (µg/L)	<0.2	< 0.2		< 0.2		<0.2	< 0.2		
54	Zn (mg/L)	0.04	0.04		0.011	<0.01	<0.01	0.01	0.02	0.02
55	Chromium (mg/L)									
56										
57	**Field Data**									
58	Temperature (C)	0.40	4.90	0.20	2	0.10	4.10	8.70	9.90	8.80
59	pH	8.42	7.49	6.35	7.4	8.04	7.15	7.90	8.32	7.38
60	Conductivity (µmho/cm	>4000	2020.00	meter frozen	965	569.00	1243.00	5100.00	3202.00	2927.00
61	Dissolved Oxygen (mg	3.77	11.56	13.05	8.52	8.76	13.50	11.00	15.16	17.65
62										
63										
64										
65										

	A	AL	AM	AN	AO	AP	AQ	AR
1	**SW2 2019-2020**							
2	**measured / estimated**	**158.40**	**360.80**	**47.90**	**25.97**	**133.10**		**121.51**
3	**effluent discharge (L/**	**50.00**	**50.00**	**12.00**				
4	**Station**	**SW-2**	**SW-2**	**SW-2**	**SW-2**	**SW-2**	**SW-2**	**SW2**
5	**LAB ID:**	**1507643**	**1508118**	**1513027**	**1521855**	**1526416**		**1533867**
6		**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-08**	**2020-12-09**
7	**Analyte**							
8	1,2-dichloroethane-d4 (	108.00				86.00		
9	1,4-dichlorobenzene (µ	<0.4				<0.4	< 0.5	
10	4-bromofluorobenzene	90.00				107.00		
11	Ag (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0002
12	Al (dissolved) (mg/L)	0.26	0.20	0.11	0.15	0.12		0.07
13	Alkalinity as CaCO3 (n	210.00	259.00	263.00	370.00	324.00	202.00	245.00
14	As (mg/L)	0.00	0.00	0.00	0.00	0.00		<0.002
15	B (mg/L)	1.40	1.20	1.90	2.10	2.10		2.05
16	Ba (mg/L)	0.08	0.08	0.10	0.08	0.09	0.18	0.19
17	Benzene (µg/L)					<0.5	< 0.5	
18	Ca (mg/L)	74.00	94.00	99.00	90.00	107.00	124.00	131.00
19	CBOD5 (mg/L)	<0.5		7.00	6.00	4.00	< 3	5.00
20	Cd (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.000070	<0.0002
21	Cl (mg/L)	190.00	162.00	218.00	329.00	335.00	323.00	364.00
22	Co (mg/L)	0.0024	0.0018	0.0022	0.0030	0.0038		0.0027
23	COD (mg/L)	72.00	67.00	70.00	78.00	98.00	121.00	108.00
24	Conductivity (µmho/cm	1830.00	1600.00	2220.00	2790.00	3100.00	3010.00	3130.00
25	Cr (mg/L)	0.0040	0.0040	0.0040	0.0040	0.0060	0.0070	0.0080
26	Cu (mg/L)	0.0050	0.0050	0.0030	0.0040	0.0030		0.0020
27	Dichloromethane (µg/L	<4.0				<4.0	< 5	
28	DOC (mg/L)	29.90	29.50	28.10	32.50	40.40	39.80	37.90
29	Fe (mg/L)	0.78	0.73	0.31	0.18	0.15	0.28	0.22
30	Filtration	Y	Y	Y	Y	Y		Y
31	Hardness as CaCO3 (	308.00	366.00	412.00	410.00	481.00		578.00
32	Hg (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002	<0.0001
33	K (mg/L)	71.00	57.00	82.00	99.00	117.00	120.00	123.00
34	Mg (mg/L)	30.00	32.00	40.00	45.00	52.00	59.60	61.00
35	Mn (mg/L)	0.04	0.06	0.03	0.02	0.01	0.03	0.02
36	Na (mg/L)	211.00	177.00	277.00	345.00	397.00	347.00	379.00
37	N-NH3 (mg/L)	0.46	0.29	0.32	0.33	0.32	0.30	0.11
38	N-NH3 (Unionized - ca	0.0023	0.0458	0.0034	0.0182	0.0007	0.0005	0.0001
39	N-NO2 (mg/L)	0.250	<0.10	0.130	<0.10	<1.0	< 1	<0.10
40	N-NO3 (mg/L)	68.00	44.60	80.40	89.30	147.00		162.00
41	P - Total (mg/L)	0.339	0.260	0.450	0.147	0.142	0.17	0.186
42	Pb (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	0.0002	<0.001
43	pH	8.19	7.98	8.09	8.31	8.24		8.20
44	Phenols (mg/L)	0.0060	0.0060	0.0080	<0.010	<0.001	< 0.002	<0.002
45	Se (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001		<0.002
46	SO4 (mg/L)	150.00	164.00	236.00	219.00	199.00	215.00	243.00
47	TDS (COND - CALC) (	1190.00	1040.00	1440.00	1810.00	2020.00	1965.00	2030.00
48	Toluene (µg/L)	<0.5				<0.5	< 0.5	
49	Toluene-d8 (%)	102.00				91.00		
50	Total Kjeldahl Nitrogen	5051.00	3.64	4.20	4.72	4.96	5.80	7.66
51	Total P - Soluble (mg/L	0.02	0.11	0.20	0.14	0.16		0.14
52	Total Suspended Solid	58.00	104.00	16.00	10.00	10.00	13.00	18.00
53	Vinyl Chloride (µg/L)	<0.2				<0.2	< 0.2	
54	Zn (mg/L)	0.01	0.01	<0.01	0.01	0.02	0.04	0.03
55	Chromium (mg/L)							
56								
57	**Field Data**							
58	Temperature (C)	20.70	20.20	15.70	10.00	1.59	1.90	0.40
59	pH	7.08	8.68	7.58	8.50	7.40	7.11	6.88
60	Conductivity (µmho/cm	1710.00	1498.00	2122.00	2615.00	2702.00	2880.00	2861.00
61	Dissolved Oxygen (mg	6.20	3.29	6.86	9.60	11.08	13.21	12.69
62								
63								
64								
65								

SWFD2 2019-2020			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)			
Flow (L/sec)								
Sample ID:						1428325.00	1431589.00	1434219.00
Station						SWFD2	SWFD2	SWFD2
Date						2019-05-23	2019-06-06	2019-06-19
Analyte	**PWQO**	**MRL**						
1,2-dichloroethane-d4 (%)						102.00	108.00	
1,4-dichlorobenzene (µg/L)			4.00			<0.4	<0.4	
4-bromofluorobenzene (%)						91.00	117.00	
Ag (mg/L)	0.0001	0.0001				<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01				0.01	<0.01	<0.01
Alkalinity as CaCO3 (mg/L)		5				178.00	200.00	252.00
As (mg/L)	0.1	0.001				0.00	<0.001	0.00
B (mg/L)	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.09	0.08	0.21
Ba (mg/L)		0.01				0.04	0.05	0.04
Benzene (µg/L)			100.00	ND/370	ND/40	<0.5	<0.5	
Ca (mg/L)		1				79.00	77.00	96.00
CBOD5 (mg/L)		1				3.00	3.00	2.00
Cd (mg/L)	0.0002	0.0001	0.00	.001/.00009	calculation	<0.0001	<0.0001	<0.0001
Cl (mg/L)		1		640/120	600/150	25.00	30.00	34.00
Co (mg/L)	0.0009	0.0002			0.110/0.004	0.0002	0.0002	<0.0002
COD (mg/L)		5				48.00	24.00	89.00
Conductivity (µmho/cm)		5				480.00	469.00	672.00
Cr (mg/L)	0.0089**	0.001	0.0089	ND/.001		0.001	<0.001	<0.001
Cu (mg/L)	0.005	0.001		ND/.004	0.029/≤0.002	0.0020	0.0020	<0.001
Dichloromethane (µg/L)			100.00	ND/9811		<4.0	<4.0	
DOC (mg/L)		0.50				20.20	17.10	36.00
Fe (mg/L)	0.3	0.03	0.30	ND/0.3	0.001/ND	0.24	0.29	0.12
Filtration						Y	Y	Y
Hardness as CaCO3 (mg/L)		1				238.00	233.00	301.00
Hg (mg/L)	0.0002	0.0001	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001
K (mg/L)		1				3.00	3.00	4.00
Mg (mg/L)		1				10.00	10.00	15.00
Mn (mg/L)		0.01				0.08	0.07	0.22
Na (mg/L)		2	180.00			19.00	19.00	32.00
N-NH3 (mg/L)		0.02				0.29	0.05	0.12
N-NH3 (Unionized - calculated	0.02		0.0200					
N-NO2 (mg/L)		0.10			0.6/0.2	<0.10	<0.10	<0.10
N-NO3 (mg/L)		0.10		124/3.0	32.8/3.0	2.35	1.94	0.25
P - Total (mg/L)	0.03*	0.01	0.03			0.37	0.16	1.64
Pb (mg/L)	0.025	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001
pH	6.5-8.5					8.29	8.39	8.00
Phenols (mg/L)	0.001	0.001	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001
Se (mg/L)	0.1	0.001				<0.001	<0.001	<0.001
SO4 (mg/L)		1			429.00	48.00	42.00	61.00
TDS (COND - CALC) (mg/L)		5				312.00	305.00	437.00
Toluene (µg/L)			0.80	ND/.002	ND/0.0005	<0.5	<0.5	
Toluene-d8 (%)						98.00	101.00	
Total Kjeldahl Nitrogen (mg/L)		0.10				1.80	1.34	1.99
Total P - Soluble (mg/L)						0.09	0.14	1.61
Total Suspended Solids (mg/L)		2				8.00	10.00	7.00
Vinyl Chloride (µg/L)			600.00			<0.2	<0.2	
Zn (mg/L)	0.03	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01
Field Data								
Temperature						14.40	21.80	
pH	6.5-8.5					8.32	8.34	
Conductivity						455.00	563.00	
Dissolved Oxygen (mg/L)						17.31	15.31	
	Meets PWQO							
	Exceeds PWQO							
	Meets CCME or MOE BC long term guideline							
	Exceeds CCME or MOE BC long term guideline							

SWFD2 2019-2020							
Flow (L/sec)							
Sample ID:				**1455465.00**		**1464894.00**	**1471802.00**
Station		**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**
Date		**2019-8-8**	**2019-9-4**	**2019-09-23**	**2019-10-10**	**2019-11-06**	**2019-12-11**
Analyte	**PWQO**						
1,2-dichloroethane-d4 (%)							
1,4-dichlorobenzene (µg/L)							
4-bromofluorobenzene (%)							
Ag (mg/L)	0.0001			<0.001		<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*			<0.01		0.01	0.02
Alkalinity as CaCO3 (mg/L)				185.00		160.00	167.00
As (mg/L)	0.1			<0.01		<0.001	<0.001
B (mg/L)	0.2*			0.20		0.09	0.05
Ba (mg/L)						0.05	0.06
Benzene (µg/L)							
Ca (mg/L)				86.00		96.00	88.00
CBOD5 (mg/L)				8.00		<1	3.00
Cd (mg/L)	0.0002			<0.001		<0.0001	<0.0001
Cl (mg/L)				66.00		31.00	29.00
Co (mg/L)	0.0009			0.006		<0.0002	0.0007
COD (mg/L)				86.00		32.00	61.00
Conductivity (µmho/cm)				641.00		662.00	593.00
Cr (mg/L)	0.0089**			0.010		<0.001	0.002
Cu (mg/L)	0.005			0.0200		0.0020	0.0040
Dichloromethane (µg/L)							
DOC (mg/L)				15.70		16.80	15.40
Fe (mg/L)	0.3			6.40		0.20	0.85
Filtration				Y		Y	Y
Hardness as CaCO3 (mg/L)				264.00		293.00	269.00
Hg (mg/L)	0.0002			<0.001		<0.0001	<0.0001
K (mg/L)				8.00		5.00	4.00
Mg (mg/L)				12.00		13.00	12.00
Mn (mg/L)				0.60		0.01	0.14
Na (mg/L)				32.00		24.00	18.00
N-NH3 (mg/L)				0.82		<0.010	0.16
N-NH3 (Unionized - calculated	0.02			0.0161		NA	0.0040
N-NO2 (mg/L)				<0.10		<0.10	<0.10
N-NO3 (mg/L)				<0.10		7.19	4.23
P - Total (mg/L)	0.03*			1.00		0.15	0.18
Pb (mg/L)	0.025			0.030		<0.001	0.001
pH	6.5-8.5			7.68		8.20	7.84
Phenols (mg/L)	0.001			0.006		<0.001	<0.001
Se (mg/L)	0.1			<0.01		<0.001	<0.001
SO4 (mg/L)				45.00		97.00	88.00
TDS (COND - CALC) (mg/L)				417.00		430.00	385.00
Toluene (µg/L)							
Toluene-d8 (%)							
Total Kjeldahl Nitrogen (mg/L)				8.20		1.46	1.90
Total P - Soluble (mg/L)				0.26		0.14	0.07
Total Suspended Solids (mg/L)				489.00		11.00	50.00
Vinyl Chloride (µg/L)							
Zn (mg/L)	0.03			<0.1		<0.01	<0.01
Field Data							
Temperature		23.50	19.30		9.30	5.00	0.23
pH	6.5-8.5	8.01	8.15		8.24	7.84	8.50
Conductivity		692.00	472.00		543.00	651.00	583.00
Dissolved Oxygen (mg/L)		8.79	7.51		13.89	11.57	meter frozen
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds C						

SWFD2 2019-2020							
Flow (L/sec)					**200.07**	**27.80**	**21.15**
Sample ID:				**1485315.00**	**1487988.00**	**1492676.00**	**1493689.00**
Station				**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**
Date		**2020-01-10**	**2020-02-14**	**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**
Analyte	**PWQO**						
1,2-dichloroethane-d4 (%)					100.00		
1,4-dichlorobenzene (µg/L)					<0.4		
4-bromofluorobenzene (%)					105.00		
Ag (mg/L)	0.0001			<0.001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*			0.02	0.01	0.03	0.02
Alkalinity as CaCO3 (mg/L)				122.00	156.00	174.00	172.00
As (mg/L)	0.1			<0.01	0.00	<0.001	<0.001
B (mg/L)	0.2*			<0.1	0.08	0.07	0.06
Ba (mg/L)				<0.1	0.04	0.04	0.04
Benzene (µg/L)					<0.5		
Ca (mg/L)				56.00	76.00	76.00	72.00
CBOD5 (mg/L)				7.00	1.00	<1	3.00
Cd (mg/L)	0.0002			<0.001	<0.0001	<0.0001	<0.0001
Cl (mg/L)				19.00	21.00	22.00	24.00
Co (mg/L)	0.0009			<0.002	0.0003	0.0003	0.0002
COD (mg/L)				471.00	50.00	46.00	39.00
Conductivity (µmho/cm)				388.00	500.00	496.00	492.00
Cr (mg/L)	0.0089**			<0.01	0.001	<0.001	<0.001
Cu (mg/L)	0.005			<0.01	0.0020	0.0020	0.0020
Dichloromethane (µg/L)					<4.0		
DOC (mg/L)				13.20	19.80	15.50	15.00
Fe (mg/L)	0.3			1.80	0.51	0.43	0.28
Filtration				Y		Y	Y
Hardness as CaCO3 (mg/L)				169.00	231.00	231.00	217.00
Hg (mg/L)	0.0002			<0.001	<0.0001	<0.0001	<0.0001
K (mg/L)				2.00	2.00	3.00	2.00
Mg (mg/L)				7.00	10.00	10.00	9.00
Mn (mg/L)				0.40	0.05	0.08	0.06
Na (mg/L)				16.00	16.00	19.00	18.00
N-NH3 (mg/L)				0.30	0.34	0.39	0.17
N-NH3 (Unionized - calculated	0.02			0.0033	0.0015	0.0255	0.0077
N-NO2 (mg/L)				<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)				2.85	3.42	1.88	1.39
P - Total (mg/L)	0.03*			0.59	0.23	0.06	0.03
Pb (mg/L)	0.025			<0.01	<0.001	<0.001	<0.001
pH	6.5-8.5			7.78	7.94	8.28	8.48
Phenols (mg/L)	0.001			<0.001	<0.001	<0.001	<0.001
Se (mg/L)	0.1			<0.01	<0.001	<0.001	<0.001
SO4 (mg/L)				45.00	56.00	49.00	48.00
TDS (COND - CALC) (mg/L)				252.00	325.00	322.00	320.00
Toluene (µg/L)					<0.5		
Toluene-d8 (%)					105.00		
Total Kjeldahl Nitrogen (mg/L)				11.30	3.21	1.79	1.36
Total P - Soluble (mg/L)				0.16	0.17	0.02	0.01
Total Suspended Solids (mg/L)				1790.00	26.00	14.00	21.00
Vinyl Chloride (µg/L)					<0.2		
Zn (mg/L)	0.03			<0.1	<0.01	<0.01	<0.01
Field Data							
Temperature				0.40	5.50	7.10	9.50
pH	6.5-8.5			8.13	7.54	8.68	8.44
Conductivity				348.00	497.00	510.00	471.00
Dissolved Oxygen (mg/L)				10.71	12.60	16.46	23.39
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds CC						

SWFD2 2019-2020							
Flow (L/sec)		**56.87**	**110.20**	**34.14**	**10.51**	**39.89**	**53.20**
Sample ID:		**1507646.00**	**1508121.00**	**1513030.00**	**1521858.00**	**1526419.00**	**1533872.00**
Station		**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**	**SWFD2**
Date		**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**
Analyte	**PWQO**						
1,2-dichloroethane-d4 (%)		107.00				87.00	
1,4-dichlorobenzene (µg/L)		<0.4				<0.4	
4-bromofluorobenzene (%)		90.00				109.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.52	0.29	0.08	0.16	<0.01	0.01
Alkalinity as CaCO3 (mg/L)		104.00	145.00	197.00	219.00	216.00	197.00
As (mg/L)	0.1	0.00	0.00	0.00	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.09	0.14	0.19	0.06	0.07	0.07
Ba (mg/L)		0.05	0.06	0.07	0.06	0.05	0.04
Benzene (µg/L)		<0.5				<0.5	
Ca (mg/L)		58.00	78.00	95.00	89.00	97.00	108.00
CBOD5 (mg/L)		7.00	3.00	3.00	7.00	4.00	2.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		22.00	33.00	40.00	34.00	36.00	28.00
Co (mg/L)	0.0009	0.0009	0.0006	0.0003	0.0003	<0.0002	<0.0002
COD (mg/L)		36.00	45.00	34.00	34.00	36.00	55.00
Conductivity (µmho/cm)		442.00	593.00	815.00	627.00	676.00	667.00
Cr (mg/L)	0.0089**	0.003	0.002	0.001	0.001	<0.001	<0.001
Cu (mg/L)	0.005	0.0060	0.0050	0.0020	0.0020	0.0020	0.0020
Dichloromethane (µg/L)		<4.0				<4.0	
DOC (mg/L)		14.90	22.50	16.80	13.90	15.50	19.00
Fe (mg/L)	0.3	1.25	0.82	0.35	0.39	0.18	0.21
Filtration		Y	Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		178.00	244.00	311.00	276.00	300.00	327.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		9.00	12.00	13.00	6.00	4.00	3.00
Mg (mg/L)		8.00	12.00	18.00	13.00	14.00	14.00
Mn (mg/L)		0.03	0.05	0.02	0.03	0.02	0.02
Na (mg/L)		19.00	27.00	49.00	21.00	23.00	16.00
N-NH3 (mg/L)		0.09	0.18	0.06	<0.010	0.91	<0.010
N-NH3 (Unionized - calculated	0.02	0.0052	0.0427	0.0024	N/A	0.0187	N/A
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		2.14	1.88	3.45	1.19	5.26	7.55
P - Total (mg/L)	0.03*	0.31	0.27	0.71	0.31	0.10	0.21
Pb (mg/L)	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	7.83	7.88	8.02	8.08	8.13	8.06
Phenols (mg/L)	0.001	0.005	0.007	0.005	0.006	<0.001	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		71.00	95.00	162.00	65.00	80.00	90.00
TDS (COND - CALC) (mg/L)		287.00	385.00	530.00	408.00	439.00	434.00
Toluene (µg/L)		<0.5				<0.5	
Toluene-d8 (%)		102.00				92.00	
Total Kjeldahl Nitrogen (mg/L)		1.36	2.15	0.80	0.98	2.21	1.74
Total P - Soluble (mg/L)		0.12	0.17	0.49	0.31	0.10	0.17
Total Suspended Solids (mg/L)		85.00	88.00	7.00	19.00	8.00	14.00
Vinyl Chloride (µg/L)		<0.2				<0.2	
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data							
Temperature		19.78	19.50	15.00	9.30	1.07	0.10
pH	6.5-8.5	8.19	8.91	8.18	8.68	8.37	7.82
Conductivity		440.00	585.00	797.00	583.00	595.00	624.00
Dissolved Oxygen (mg/L)		6.07	3.61	6.66	8.95	12.11	12.49
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds CC						

SWFD3 2019-2020			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)			
Estimated or Measured Flow (L/sec)						NA	NA	69
Effluent Discharge (related to site) (L/sec)						NA	NA	NA
Lab ID		Regulated						1428327
Station		Effluent				SWFD3	SWFD3	SWFD3
		Parameter				2019-03-11	2019-05-08	2019-05-23
Analyte	MRL	mg/L						
1,2-dichloroethane-d4 (%)								98
1,4-dichlorobenzene (µg/L)			4			< 0.5	< 0.5	<0.4
4-bromofluorobenzene (%)								91
Ag (mg/L)	0.0001							<0.0001
Al (dissolved) (mg/L)	0.01							0.02
Alkalinity as CaCO3 (mg/L)	5					49	136	167
As (mg/L)	0.001							<0.001
B (mg/L)	0.01		0.2*	29/1.5	ND/1.2	0.028	0.088	0.040
Ba (mg/L)	0.01					0.02	0.08	0.04
Benzene (µg/L)			100	ND/370	ND/40	< 0.5	< 0.5	<0.5
Ca (mg/L)	1					26	78	75
CBOD5 (mg/L)	1	10.0				< 3	< 3	3
Cd (mg/L)	0.0001		0.0002	.001/.00009	calculation	0.00009	< 0.000070	<0.0001
Cl (mg/L)	1			640/120	600/150	18.2	49.5	19.0
Co (mg/L)	0.0002				0.110/0.004			<0.0002
COD (mg/L)	5					29	47	56
Conductivity (µmho/cm)	5					196	454	380
Cr (mg/L)	0.001		0.0089	ND/.001		0.002	0.004	0.001
Cu (mg/L)	0.001	0.2		ND/.004	0.029/≤0.002	0.0069	0.0048	0.0020
Dichloromethane (µg/L)			100	ND/9811		< 5	< 5	<4.0
DOC (mg/L)	0.5					6.5	16.7	17.4
Fe (mg/L)	0.03	1.0	0.3	ND/0.3	0.001/ND	0.448	1.840	0.260
Filtration								Y
Hardness as CaCO3 (mg/L	1							220
Hg (mg/L)	0.0001		0.0002	ND/.000026	ND/calculation	< 0.00002	0.00003	<0.0001
K (mg/L)	1					2	3	2
Mg (mg/L)	1					2	11	8
Mn (mg/L)	0.005					0.02	0.25	0.06
Na (mg/L)	2		180			10	15	11
N-NH3 (mg/L)	0.02	1.0				0.390	0.380	0.020
N-NH3 (Unionized - calculated) (mg/L)			0.0200			<0.2	<0.2	
N-NO2 (mg/L)	0.10				0.6/0.2	< 0.1	< 1	<0.10
N-NO3 (mg/L)	0.10			124/3.0	32.8/3.0	0.80	14.40	2.22
P - Total (mg/L)	0.01	0.3	0.030			0.200	0.320	0.115
Pb (mg/L)	0.001		0.025	ND/.007	0.003/ND	0.003	0.001	<0.001
pH								8.33
Phenols (mg/L)	0.001	0.005	0.0010	ND/0.004	.050/ND	< 0.002	< 0.002	<0.001
Se (mg/L)	0.001							<0.001
SO4 (mg/L)	1				429	15	51	38
TDS (COND - CALC) (mg/L	5					108	355	247
Toluene (µg/L)			0.8	ND/.002	ND/0.0005	< 0.5	< 0.5	<0.5
Toluene-d8 (%)								97
Total Kjeldahl Nitrogen (mg	0.10					1.0	3	1.1
Total P - Soluble (mg/L)								0.054
Total Suspended Solids (mg	2	10.0				14	7	12
Vinyl Chloride (µg/L)			600			< 0.2	< 0.2	<0.2
Zn (mg/L)	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.02	0.01	<0.01
Field Data								
Temperature						1.1	1.4	15.9
pH						8.5	7.12	8.67
Conductivity						445	418	362.9
Dissolved Oxygen (mg/L)		4				10.6	11.14	20.44
	Meets PWQO							
	Exceeds PWQO							
	Meets CCME or MOE BC long term guideline							
	Exceeds CCME or MOE BC long term guideline							

SWFD3 2019-2020							Est'd.
Estimated or Measured Flow (L/sec)		33	14	7.4	47	1.3	0
Effluent Discharge (related to site) (L		NA	NA	NA	NA	NA	NA
Lab ID		1431585	1434218		1440942	1446257	B19-26597
Station		SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3
		2019-06-06	2019-06-19	2019-7-10	2019-07-12	2019-08-08	2019-8-23
Analyte	MRL						
1,2-dichloroethane-d4 (%)		100					
1,4-dichlorobenzene (µg/L)		<0.4					< 0.5
4-bromofluorobenzene (%)		115					
Ag (mg/L)	0.0001	<0.0001	<0.0001		<0.0001	<0.0001	
Al (dissolved) (mg/L)	0.01	<0.01	0.01		0.02	<0.01	
Alkalinity as CaCO3 (mg/L)	5	171	179		159	198	156
As (mg/L)	0.001	<0.001	<0.001		<0.001	<0.001	
B (mg/L)	0.01	0.020	0.020		0.030	0.030	0.073
Ba (mg/L)	0.01	0.05	0.06		0.06	0.06	0.07
Benzene (µg/L)		<0.5					< 0.5
Ca (mg/L)	1	74	89		67	75	95
CBOD5 (mg/L)	1	5	3		<1	1	< 3
Cd (mg/L)	0.0001	<0.0001	<0.0001		<0.0001	<0.0001	< 0.000070
Cl (mg/L)	1	24.0	28.0		40.0	36.0	27.0
Co (mg/L)	0.0002	<0.0002	0.0002		<0.0002	0.0003	
COD (mg/L)	5	42	39		33	32	58
Conductivity (µmho/cm)	5	420	522		522	536	474
Cr (mg/L)	0.001	<0.001	<0.001		<0.001	0.002	0.002
Cu (mg/L)	0.001	0.0020	0.0020		0.0020	0.0030	0.0031
Dichloromethane (µg/L)		<4.0					< 5
DOC (mg/L)	0.5	16.7	15.3		15.2	14.5	14.2
Fe (mg/L)	0.03	0.280	0.370		0.240	0.350	0.897
Filtration		Y	Y		Y	Y	
Hardness as CaCO3 (mg/L	1	222	259		200	233	449.0
Hg (mg/L)	0.0001	<0.0001	<0.0001		<0.0001	<0.0001	< 0.00002
K (mg/L)	1	1	2		2	3	5
Mg (mg/L)	1	9	9		8	11	16
Mn (mg/L)	0.005	0.11	0.08		0.02	0.03	0.19
Na (mg/L)	2	12	13		25	21	43
N-NH3 (mg/L)	0.02	0.044	0.050		0.020	0.030	0.190
N-NH3 (Unionized - calculated) (mg/L)						0.001	
N-NO2 (mg/L)	0.10	<0.10	<0.10		<0.10	<0.10	< 0.1
N-NO3 (mg/L)	0.10	1.99	4.07		3.38	<0.10	0.20
P - Total (mg/L)	0.01	0.078	0.100		0.050	0.054	0.120
Pb (mg/L)	0.001	<0.001	<0.001		<0.001	<0.001	0.0003
pH		8.19	8.1		8.14	8.61	
Phenols (mg/L)	0.001	<0.001	<0.001		<0.001	<0.001	< 0.002
Se (mg/L)	0.001	<0.001	<0.001		<0.001	<0.001	
SO4 (mg/L)	1	33	33		43	32	27
TDS (COND - CALC) (mg/L	5	273	339		339	348	308
Toluene (µg/L)		<0.5					< 0.5
Toluene-d8 (%)		102					
Total Kjeldahl Nitrogen (mg	0.10	1.09	1.21		1.13	0.95	1
Total P - Soluble (mg/L)		0.0762	0.076		0.032	0.025	
Total Suspended Solids (mg	2	10	17		5	32	20
Vinyl Chloride (µg/L)		<0.2					< 0.2
Zn (mg/L)	0.01	<0.01	<0.01		<0.01	<0.01	0.01
Field Data							
Temperature		15.7	21.3	28	20.2	20.2	20.6
pH		7.86	7.87	9.21	7.78	8.02	6.69
Conductivity		481	531	403	553	590	
Dissolved Oxygen (mg/L)		15.65	10.33	7.36	6.78	0.51	
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020		Est'd	Est'd.	Est'd.		Est'd.	Est'd.
Estimated or Measured Flow (L/sec)		0	3.3	9.2	2.5	3.1	1.6
Effluent Discharge (related to site) (L		NA	NA	NA	NA	NA	NA
Lab ID		B19-27095	B19-27537	B19-27824		B19-28281	B19-28725
Station		SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3
		2019-8-27	2019-8-30	2019-9-3	2019-9-4	2019-9-6	2019-9-10
Analyte	MRL						
1,2-dichloroethane-d4 (%)							
1,4-dichlorobenzene (µg/L)		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
4-bromofluorobenzene (%)							
Ag (mg/L)	0.0001						
Al (dissolved) (mg/L)	0.01						
Alkalinity as CaCO3 (mg/L)	5	388	175	157		170	173
As (mg/L)	0.001						
B (mg/L)	0.01	0.196	0.030	0.028		0.021	0.020
Ba (mg/L)	0.01	0	0.055	0.044		0.045	0.046
Benzene (µg/L)		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Ca (mg/L)	1	232.0	79.3	69.6		68.8	79.9
CBOD5 (mg/L)	1	< 3	< 3	< 3		< 3	< 3
Cd (mg/L)	0.0001	< 0.000070	< 0.000070	< 0.000070		< 0.000070	< 0.000070
Cl (mg/L)	1	491.0	55.8	29.2		42.7	49.6
Co (mg/L)	0.0002						
COD (mg/L)	5	47	40	41		25	18
Conductivity (µmho/cm)	5	1960.0	566	472		518	512
Cr (mg/L)	0.001	0.002	< 0.001	0.001		< 0.001	0.002
Cu (mg/L)	0.001	0.0022	0.0019	0.0021		0.0016	0.0024
Dichloromethane (µg/L)		< 5	< 5	< 5		< 5	< 5
DOC (mg/L)	0.5	18.60	13	13		14	13
Fe (mg/L)	0.03	0.758	0.185	0.279		0.123	0.133
Filtration							
Hardness as CaCO3 (mg/L	1						
Hg (mg/L)	0.0001	0.00003	0.00003	0.00003		< 0.00002	< 0.00002
K (mg/L)	1	9.8	4.6	4		2.7	2
Mg (mg/L)	1	38.7	11.8	9.7		10.1	10.7
Mn (mg/L)	0.005	0.472	0.023	0.037		0.008	0.012
Na (mg/L)	2	159	23.7	14.5		18.7	17.9
N-NH3 (mg/L)	0.02	1.070	0.080	0.040		0.030	0.020
N-NH3 (Unionized - calculated) (mg/L)							
N-NO2 (mg/L)	0.10	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
N-NO3 (mg/L)	0.10	0.100	< 0.1	0.3		0.2	0.5
P - Total (mg/L)	0.01	0.120	0.050	0.130		0.030	0.030
Pb (mg/L)	0.001	0.0004	0.00010	0.00020		< 0.0001	0.00030
pH							
Phenols (mg/L)	0.001	< 0.002	< 0.002	< 0.002		< 0.002	< 0.002
Se (mg/L)	0.001						
SO4 (mg/L)	1	65	55	38		41	52
TDS (COND - CALC) (mg/L	5	1231.00	336	261		287	319
Toluene (µg/L)		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
Toluene-d8 (%)							
Total Kjeldahl Nitrogen (mg	0.10	2.50	0.8	0.8		0.7	0.7
Total P - Soluble (mg/L)							
Total Suspended Solids (m	2	16	8	11		4	6
Vinyl Chloride (µg/L)		< 0.2	< 0.2	< 0.2		< 0.2	< 0.2
Zn (mg/L)	0.01	0.005	0.006	< 0.005		< 0.005	0.005
Field Data							
Temperature		15.5	17.8	16	18	15.3	10
pH		7.31	7.41	7.45	7.88	7.41	7.32
Conductivity					461		
Dissolved Oxygen (mg/L)					6.1		
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020		Est'd.		Est'd.			Est'd.
Estimated or Measured Flow (L/sec)		0	12	17	41	41	28
Effluent Discharge (related to site) (L		NA	NA	NA	NA	NA	NA
Lab ID		1455464	1459459	B19-33323-3	B19-33766-3	1460890	B19-34301-3
Station		SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3
		2019-09-23	2019-10-10	2019-10-15	2019-10-18	2019-10-18	2019-10-22
Analyte	MRL						
1,2-dichloroethane-d4 (%)			95.7				
1,4-dichlorobenzene (µg/L)			<0.4	< 0.5	< 0.5		< 0.5
4-bromofluorobenzene (%)			96				
Ag (mg/L)	0.0001	<0.0001	<0.0001			<0.0001	
Al (dissolved) (mg/L)	0.01	<0.01	<0.01			0.02	
Alkalinity as CaCO3 (mg/L)	5	316	175	159	128	113	145
As (mg/L)	0.001	0.001	<0.001			<0.001	
B (mg/L)	0.01	0.140	0.020	0.017	0.026	0.060	0.019
Ba (mg/L)	0.01	0.1	0.05	0.055	0.058	0.03	0.06
Benzene (µg/L)			<0.5	< 0.5	< 0.5		< 0.5
Ca (mg/L)	1	147	86	71.1	76.1	71	73.7
CBOD5 (mg/L)	1	7	5	< 3	< 3	8	< 3
Cd (mg/L)	0.0001	<0.0001	<0.0001	< 0.000070	< 0.000070	<0.0001	< 0.000070
Cl (mg/L)	1	193.0	38.0	34.0	36.3	30.0	39.1
Co (mg/L)	0.0002	0.0005	<0.0002			<0.0002	
COD (mg/L)	5	49	22	24	53	37	22
Conductivity (µmho/cm)	5	1270	532	507	527	526	526
Cr (mg/L)	0.001	<0.001	<0.001	< 0.001	< 0.001	<0.001	< 0.001
Cu (mg/L)	0.001	0.0020	0.0010	0.0006	0.0017	0.0020	0.0010
Dichloromethane (µg/L)			<4.0	< 5	< 5		< 5
DOC (mg/L)	0.5	15	9.6	11.3	15.9	14.5	12.2
Fe (mg/L)	0.03	1.260	0.260	0.115	0.198	0.240	0.164
Filtration		Y	Y			Y	
Hardness as CaCO3 (mg/L	1	466	256	218	226	214	225
Hg (mg/L)	0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002	<0.0001	0.00002
K (mg/L)	1	7	3	6.1	3.7	5	2.7
Mg (mg/L)	1	24	10	9.81	8.77	9	9.85
Mn (mg/L)	0.005	0.51	0.03	0.004	0.005	<0.01	0.004
Na (mg/L)	2	86	20	15.8	23.1	20	23
N-NH3 (mg/L)	0.02	0.540	0.030	0.030	0.050	0.051	0.030
N-NH3 (Unionized - calculated) (mg/L)		0.010	0.0012	0.0006	0.0001	0.0006	0.0008
N-NO2 (mg/L)	0.10	<0.10	<0.10	< 0.1	< 0.1	<0.10	< 0.1
N-NO3 (mg/L)	0.10	<0.10	0.8	0.8	4.3	4.43	1.5
P - Total (mg/L)	0.01	0.183	0.041	< 0.01	0.060	0.050	0.030
Pb (mg/L)	0.001	<0.001	<0.001	< 0.0001	0.0002	<0.001	< 0.0001
pH		7.75	8.34			7.8	
Phenols (mg/L)	0.001	0.003	<0.001	< 0.002	< 0.002	<0.001	< 0.002
Se (mg/L)	0.001	<0.001	<0.001			<0.001	
SO4 (mg/L)	1	66	46	57	64	86	57
TDS (COND - CALC) (mg/L	5	311	346	299	324	342	299
Toluene (µg/L)		< 0.5	<0.5	< 0.5	< 0.5		< 0.5
Toluene-d8 (%)			94				
Total Kjeldahl Nitrogen (mg	0.10	1.6	1.14	0.5	1	1.59	0.6
Total P - Soluble (mg/L)		0.025	0.016			0.034	
Total Suspended Solids (mg	2	201	10	< 3	4	7	< 3
Vinyl Chloride (µg/L)			<0.2	< 0.2	< 0.2		< 0.2
Zn (mg/L)	0.01	<0.01	<0.01	0.017	0.006	<0.01	< 0.005
Field Data							
Temperature		18.3		7.3	8	8.7	9.5
pH		meter failure		7.36	7.87	6.66	7.34
Conductivity		meter failure			553		
Dissolved Oxygen (mg/L)		2.1			10.27		
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020							
Estimated or Measured Flow (L/sec)		**19**	**49.22**	**43**	**100**	**64**	**nil**
Effluent Discharge (related to site) (L		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Lab ID		**B19-34716-3**	**B19-35135-3**	**B19-35418-3**	**1464890**	**1471810**	**1475062**
Station		**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**
		2019-10-25	**2019-10-29**	**2019-10-31**	**2019-11-06**	**2019-12-11**	**2020-01-10**
Analyte	MRL						
1,2-dichloroethane-d4 (%)							88
1,4-dichlorobenzene (µg/L)		< 0.5	< 0.5	< 0.5			<0.4
4-bromofluorobenzene (%)							101
Ag (mg/L)	0.0001				<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.01				0.01	0.02	0.01
Alkalinity as CaCO3 (mg/L)	5	160	95	144	138	157	162
As (mg/L)	0.001				<0.001	<0.001	<0.001
B (mg/L)	0.01	0.022	0.042	0.027	0.070	0.040	0.020
Ba (mg/L)	0.01	0.065	0.059	0.065	0.05	0.05	0.05
Benzene (µg/L)		< 0.5	< 0.5	< 0.5			<0.5
Ca (mg/L)	1	83.9	76.9	84.7	92	85	91
CBOD5 (mg/L)	1	< 3	< 3	< 3	<1	3	3
Cd (mg/L)	0.0001	< 0.000070	< 0.000070	< 0.000070	<0.0001	<0.0001	<0.0001
Cl (mg/L)	1	38.7	26.0	32.0	27.0	26.0	26.0
Co (mg/L)	0.0002				<0.0002	<0.0002	<0.0002
COD (mg/L)	5	34	34	38	42	35	34
Conductivity (µmho/cm)	5	547	436	559	583	543	552
Cr (mg/L)	0.001	< 0.001	< 0.001	< 0.001	<0.001	<0.001	0.002
Cu (mg/L)	0.001	0.0020	0.0044	0.0031	0.0010	0.0020	0.0020
Dichloromethane (µg/L)		< 5	< 5	< 5			<4.0
DOC (mg/L)	0.5	11.4	13.9	15.1	17.1	15.3	12.2
Fe (mg/L)	0.03	0.121	0.099	0.061	0.100	0.170	0.230
Filtration					Y	Y	Y
Hardness as CaCO3 (mg/L	1	251	234	256	275	253	268
Hg (mg/L)	0.0001	0.00004	0.00005	0.00003	<0.0001	<0.0001	<0.0001
K (mg/L)	1	4.5	3	2.4	3	2	2
Mg (mg/L)	1	10.1	10.1	10.7	11	10	10
Mn (mg/L)	0.005	0.003	0.002	0.002	<0.01	0.02	<0.01
Na (mg/L)	2	19.8	17.1	16.7	15	13	12
N-NH3 (mg/L)	0.02	0.030	0.040	0.050	<0.010	<0.010	0.020
N-NH3 (Unionized - calculated) (mg/L)		0.0001	0.0003	0.001	NA	NC	0.000472521
N-NO2 (mg/L)	0.10	< 0.1	< 0.1	< 0.1	<0.10	<0.10	<0.10
N-NO3 (mg/L)	0.10	1.7	4.4	3.4	7.72	4.89	3.79
P - Total (mg/L)	0.01	0.020	0.020	0.020	0.166	0.084	0.036
Pb (mg/L)	0.001	0.0001	< 0.0001	< 0.0001	<0.001	<0.001	<0.001
pH					8.13	7.96	7.84
Phenols (mg/L)	0.001	< 0.002	< 0.001	< 0.002	<0.001	<0.001	0.002
Se (mg/L)	0.001				<0.001	<0.001	<0.001
SO4 (mg/L)	1	64	63	81		77	75
TDS (COND - CALC) (mg/L	5	324	272	329		353	359
Toluene (µg/L)		< 0.5	< 0.5	< 0.5	0.9		<0.5
Toluene-d8 (%)							108
Total Kjeldahl Nitrogen (mg	0.10	0.6	1	0.8	1	0.9	1.32
Total P - Soluble (mg/L)						0.065	0.026
Total Suspended Solids (mg	2	17	< 3	4	< 3	6	4
Vinyl Chloride (µg/L)		< 0.2	< 0.2	< 0.2	< 0.2		<0.2
Zn (mg/L)	0.01	< 0.005	0.007	0.009	0.007	<0.01	<0.01
Field Data							
Temperature		8.7	8.1	11.7	5.1	0.21	0.1
pH		6.66	7.05	7.4	7.47	8.32	8.47
Conductivity					576	532	517
Dissolved Oxygen (mg/L)					12.4	meter frozen	13.74
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020							
Estimated or Measured Flow (L/sec)		**2.4**		**246.3**	**143.9**		**15.9**
Effluent Discharge (related to site) (L		**NA**		**NA**	**NA**		**NA**
Lab ID	**I**	**1480015**		**1485316**	**1487989**		**1492677**
Station		**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**
		2020-02-14	**2020-03-16**	**2020-03-17**	**2020-04-07**	**2020-05-02**	**2020-05-08**
Analyte	MRL						
1,2-dichloroethane-d4 (%)					106		
1,4-dichlorobenzene (µg/L)			< 0.5		<0.4	< 0.5	
4-bromofluorobenzene (%)					105		
Ag (mg/L)	0.0001	<0.0001		<0.0001	<0.0001		<0.0001
Al (dissolved) (mg/L)	0.01	0.01		0.01	0.01		0.03
Alkalinity as CaCO3 (mg/L)	5	153	97.00	124	131	143	168
As (mg/L)	0.001	<0.001		<0.001	<0.001		<0.001
B (mg/L)	0.01	0.020	0.02	0.030	0.030	0.024	0.030
Ba (mg/L)	0.01	0.04	0.03	0.03	0.05	0.043	0.04
Benzene (µg/L)			< 0.5		<0.5	< 0.5	
Ca (mg/L)	1	78	54.50	61	65	74.5	72
CBOD5 (mg/L)	1	4	11.00	5	3	< 3	<1
Cd (mg/L)	0.0001	<0.0001	< 0.000070	<0.0001	<0.0001	< 0.000070	<0.0001
Cl (mg/L)	1	21.0	25.30	21.0	17.0	21.1	18.0
Co (mg/L)	0.0002	<0.0002		0.0003	0.0008		0.0002
COD (mg/L)	5	27	31.00	49	53	43	39
Conductivity (µmho/cm)	5	464	358.00	398	401	431	432
Cr (mg/L)	0.001	<0.001	0.00	0.001	0.002	0.001	<0.001
Cu (mg/L)	0.001	0.0010	0.00	0.0020	0.0030	0.0017	0.0010
Dichloromethane (µg/L)			< 5		<4.0	< 5	
DOC (mg/L)	0.5	12.6	12.80	11.4	15	15.3	16.1
Fe (mg/L)	0.03	0.280	0.45	0.600	1.250	0.441	0.400
Filtration		Y		Y			Y
Hardness as CaCO3 (mg/L	1	232		177	191		217
Hg (mg/L)	0.0001	<0.0001	< 0.00002	<0.0001	<0.0001	< 0.00002	<0.0001
K (mg/L)	1	1	1.70	1	1	1.7	2
Mg (mg/L)	1	9	6.58	6	7	8.87	9
Mn (mg/L)	0.005	0.04	0.03	0.04	0.23	0.074	0.09
Na (mg/L)	2	12	11.00	16	11	13	12
N-NH3 (mg/L)	0.02	0.059	0.10	0.142	0.132	0.05	0.050
N-NH3 (Unionized - calculated) (mg/L)		0.000224893	<0.2	0.00095597	0.0013	<0.2	0.00335598
N-NO2 (mg/L)	0.10	<0.10	< 1	<0.10	<0.10	< 1	<0.10
N-NO3 (mg/L)	0.10	1.42	3.80	3.26	3.06	1.9	1.68
P - Total (mg/L)	0.01	0.024	0.09	0.171	0.184	0.08	0.075
Pb (mg/L)	0.001	<0.001	0.00	<0.001	<0.001	0.0001	<0.001
pH		8.2		7.87	7.88		8.14
Phenols (mg/L)	0.001	<0.001	0.00	<0.001	<0.001	< 0.002	<0.001
Se (mg/L)	0.001	<0.001		<0.001	<0.001		<0.001
SO4 (mg/L)	1	60	35.00	36	36	31	39
TDS (COND - CALC) (mg/L	5	302	209.00	259	261	245	281
Toluene (µg/L)			< 0.5		<0.5	< 0.5	
Toluene-d8 (%)					105		
Total Kjeldahl Nitrogen (mg	0.10	0.907	0.90	1.62	2.75	0.9	1.14
Total P - Soluble (mg/L)		0.015		0.094	0.0923		0.045
Total Suspended Solids (m	2	7	13.00	62	85	7	11
Vinyl Chloride (µg/L)			< 0.2		<0.2	< 0.2	
Zn (mg/L)	0.01	<0.01	0.01	<0.01	<0.01	0.005	<0.01
Field Data							
Temperature		-0.2	1.90	0.3	7.1	9.8	5.2
pH		7.68	6.92	7.91	7.83	7.27	8.75
Conductivity		87	407.00	365	396	580	440
Dissolved Oxygen (mg/L)		10.47	11.52	10.93	10.91	9.87	16.25
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020							
Estimated or Measured Flow (L/sec)		**9.8**	**22.7**	**92.3**	**11.7**	**25.29**	**52.37**
Effluent Discharge (related to site) (L		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Lab ID	**I**	**1493690**	**1507649**	**1508124**	**1513032**	**1521860**	**1526421**
Station		**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**
		2020-05-14	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**
Analyte	MRL						
1,2-dichloroethane-d4 (%)			110				88
1,4-dichlorobenzene (µg/L)			<0.4				<0.4
4-bromofluorobenzene (%)			89				106
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.01	0.02	0.21	0.08	0.06	0.09	<0.01
Alkalinity as CaCO3 (mg/L)	5	156	135	120	193	158.00	173
As (mg/L)	0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
B (mg/L)	0.01	0.020	0.070	0.110	0.030	0.040	0.030
Ba (mg/L)	0.01	0.04	0.06	0.05	0.06	0.05	0.04
Benzene (µg/L)			<0.5				<0.5
Ca (mg/L)	1	68	68	70	79	73.00	88
CBOD5 (mg/L)	1	3	7	3	4	9.00	3
Cd (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	1	18.0	40.0	25.0	44.0	35.0	32.0
Co (mg/L)	0.0002	<0.0002	0.0005	0.0003	0.0002	<0.0002	<0.0002
COD (mg/L)	5	30	55	37	28	29.00	30
Conductivity (µmho/cm)	5	430	524	470	582	525.00	572
Cr (mg/L)	0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001
Cu (mg/L)	0.001	0.0010	0.0040	0.0050	0.0020	0.0020	0.0010
Dichloromethane (µg/L)			<4.0				<4.0
DOC (mg/L)	0.5	15.3	19.5	19.4	12.3	12.70	12.1
Fe (mg/L)	0.03	0.300	0.840	0.370	0.350	0.270	0.120
Filtration		Y	Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L	1	199	199	212	238	219.00	265
Hg (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	1	1	3	3	2	5.00	2
Mg (mg/L)	1	7	7	9	10	9.00	11
Mn (mg/L)	0.005	0.08	0.03	0.03	0.03	0.02	0.01
Na (mg/L)	2	11	31	17	29	18.00	15
N-NH3 (mg/L)	0.02	<0.010	0.093	0.075	<0.05	<0.010	<0.010
N-NH3 (Unionized - calculated) (mg/L)		NC	0.014	0.018	NC	N/A	N/A
N-NO2 (mg/L)	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)	0.10	1.31		1.97	1.23	1.02	5.81
P - Total (mg/L)	0.01	0.023	0.095	0.104	0.075	0.046	0.017
Pb (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH		8.31	8.07	7.96	7.95	7.99	8.17
Phenols (mg/L)	0.001	<0.001	0.005	0.005	0.003	0.006	<0.001
Se (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	1	38	62	66	40	54.00	59
TDS (COND - CALC) (mg/L	5	280	341	306	378	341.00	372
Toluene (µg/L)			<0.5				<0.5
Toluene-d8 (%)			102				90
Total Kjeldahl Nitrogen (mg	0.10	1.09	1.86	1.4	0.9	1.04	0.855
Total P - Soluble (mg/L)		0.011	0.03	<0.020	0.044	0.04	0.017
Total Suspended Solids (m	2	5	44	16	16	15.00	6
Vinyl Chloride (µg/L)			<0.2				<0.2
Zn (mg/L)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data							
Temperature			23.66	21	15	9.9	1.07
pH		8.28	8.54	8.87	6.38	8.78	9.11
Conductivity		420	493	547	571	509	522
Dissolved Oxygen (mg/L)		16.33	5.14	5.13	6.69	9.27	12.69
	Meets PW						
	Exceeds P						
	Meets CCI						
	Exceeds C						

SWFD3 2019-2020			
Estimated or Measured Flow (L/sec)			**48.88**
Effluent Discharge (related to site) (L			**NA**
Lab ID		**I**	**1533874**
Station		**SWFD3**	**SWFD3**
		2020-12-08	**2020-12-09**
Analyte	MRL		
1,2-dichloroethane-d4 (%)			
1,4-dichlorobenzene (µg/L)		< 0.5	
4-bromofluorobenzene (%)			
Ag (mg/L)	0.0001		<0.0001
Al (dissolved) (mg/L)	0.01		0.01
Alkalinity as CaCO3 (mg/L)	5	145.00	180
As (mg/L)	0.001		<0.001
B (mg/L)	0.01	0.04	0.040
Ba (mg/L)	0.01	0.04	0.04
Benzene (µg/L)		< 0.5	
Ca (mg/L)	1	87.90	98
CBOD5 (mg/L)	1	< 3	3
Cd (mg/L)	0.0001	< 0.000070	<0.0001
Cl (mg/L)	1	28.00	25.0
Co (mg/L)	0.0002		<0.0002
COD (mg/L)	5	47.00	45
Conductivity (µmho/cm)	5	591.00	580
Cr (mg/L)	0.001	< 0.001	<0.001
Cu (mg/L)	0.001	0.00	0.0020
Dichloromethane (µg/L)		< 5	
DOC (mg/L)	0.5	17.60	16.3
Fe (mg/L)	0.03	0.14	0.160
Filtration			Y
Hardness as CaCO3 (mg/L	1		290
Hg (mg/L)	0.0001	< 0.00002	<0.0001
K (mg/L)	1	1.70	2
Mg (mg/L)	1	10.80	11
Mn (mg/L)	0.005	0.02	0.02
Na (mg/L)	2	11.80	12
N-NH3 (mg/L)	0.02	0.07	<0.010
N-NH3 (Unionized - calculated) (mg/L)		0.00	N/A
N-NO2 (mg/L)	0.10	< 1	<0.10
N-NO3 (mg/L)	0.10	9.10	7.96
P - Total (mg/L)	0.01	0.12	0.133
Pb (mg/L)	0.001	< 0.0001	<0.001
pH			8.01
Phenols (mg/L)	0.001	< 0.002	<0.001
Se (mg/L)	0.001		<0.001
SO4 (mg/L)	1	69.00	72
TDS (COND - CALC) (mg/L	5	337.00	377
Toluene (µg/L)		< 0.5	
Toluene-d8 (%)			
Total Kjeldahl Nitrogen (mg	0.10	1.30	1.39
Total P - Soluble (mg/L)			0.117
Total Suspended Solids (m	2	< 3	4
Vinyl Chloride (µg/L)		< 0.2	
Zn (mg/L)	0.01	0.01	<0.01
Field Data			
Temperature		1.30	0.1
pH		6.78	7.95
Conductivity		665.00	538
Dissolved Oxygen (mg/L)		13.98	12.91
	Meets PW		
	Exceeds P		
	Meets CCI		
	Exceeds C		

SWFD4 2019-2020			Reglated Effluent Parameter (mg/L)	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)			
Estimated Stream Flow (L/sec)							**38.00**	**37.00**	**27.00**
Effluent Discharge Rate (L/sec)							**NA**	**NA**	**NA**
LAB ID:							**1428329.00**	**1431584.00**	**1434215.00**
Station Name							**SW4**	**SWFD4**	**SWFD4**
Sample Date							**2019-05-23**	**2019-06-06**	**2019-06-19**
Analyte	PWQO	MRL							
1,2-dichloroethane-d4 (%)							94.00	105.00	
1,4-dichlorobenzene (µg/L)				4			<0.4	<0.4	
4-bromofluorobenzene (%)							91.00	114.00	
Ag (mg/L)	0.0001	0.0001					<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01					0.02	<0.01	<0.01
Alkalinity as CaCO3 (mg/L)		5					145.00	160.00	182.00
As (mg/L)	0.1	0.001					<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.020	0.010	0.010
Ba (mg/L)		0.01					0.04	0.05	0.06
Benzene (µg/L)				100	ND/370	ND/40	<0.5	<0.5	
Ca (mg/L)		1					70.00	70.00	84.00
CBOD5 (mg/L)	1		10.0				5.00	4.00	3.00
Cd (mg/L)	0.0002*	0.0001		0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001
Cl (mg/L)		1			640/120	600/150	20.000	25.000	30.000
Co (mg/L)	0.0009	0.0002				0.110/0.004	<0.0002	<0.0002	<0.0002
COD (mg/L)		5					38.00	33.00	24.00
Conductivity (µmho/cm)		5					370.00	410.00	509.00
Cr (mg/L)	0.0089**	0.001		0.0089	ND/.001		0.0010	<0.001	<0.001
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.0010	<0.001	0.0010
Dichloromethane (µg/L)				100	ND/9811		<4.0	<4.0	
DOC (mg/L)		0.50					14.80	14.00	13.20
Fe (mg/L)	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.310	0.290	0.250
Filtration							Y	Y	Y
Hardness as CaCO3 (mg/L)		1					204.00	208.00	247.00
Hg (mg/L)	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001
K (mg/L)		1					1.00	1.00	1.00
Mg (mg/L)		1					7.00	8.00	9.00
Mn (mg/L)		0.01					0.06	0.07	0.06
Na (mg/L)		2		180			10.00	12.00	12.00
N-NH3 (mg/L)		0.02	1.0				0.020	0.042	0.030
H3 (Unionized - calculated) (r	0.02			0.0200					
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	<0.10	<0.10
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	2.490	2.080	3.820
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.091	0.029	0.034
Pb (mg/L)	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001
pH	6.5-8.5						8.14	8.15	8.13
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001
Se (mg/L)	0.1	0.001					<0.001	<0.001	<0.001
SO4 (mg/L)		1				429	31.00	31.00	31.00
TDS (COND - CALC) (mg/L)		5					240.00	266.00	331.00
Toluene (µg/L)				0.8	ND/.002	ND/0.0005	<0.5	<0.5	
Toluene-d8 (%)							96.00	104.00	
Total Kjeldahl Nitrogen (mg/L)		0.10					1.30	6.24	1.12
Total P - Soluble (mg/L)							0.04	0.02	0.02
Total Suspended Solids (mg/L)		2	10.0	600			7.00	3.00	9.00
Vinyl Chloride (µg/L)							<0.2	<0.2	
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01
Field Data									
Temperature							13.80	12.10	15.40
pH	6.5-8.5						8.11	7.77	7.45
Conductivity							300.00	468.00	525.00
Dissolved Oxygen (mg/L)			>4				13.20	14.00	10.43
NA = not applicable									
	Meets PWQO								
	Exceeds PWQO								
	Meets CCME or MOE BC long term guideline								
	Exceeds CCME or MOE BC long term guideline								

SWFD4 2019-2020									
stimated Stream Flow (L/sec)		39.00	4.30	7.40	3.90	6.70	31.00	54.00	509.00
fluent Discharge Rate (L/sec)		NA	NA	NA	NA	NA	NA	NA	NA
LAB ID:		1440941.00	1446256.00		1455463.00	1459458.00	1460889.00	1464889.00	1471800.00
Station Name		SWFD4	SWDF4	SWFD4	SWFD4	SWFD4	SWFD4	SWFD4	SWFD4
Sample Date		2019-07-12	2019-08-08	2019-9-4	2019-09-23	2019-10-10	2019-10-18	2019-11-06	2019-12-11
Analyte	PWQO								
1,2-dichloroethane-d4 (%)						95.70			
1,4-dichlorobenzene (µg/L)						<0.4			
4-bromofluorobenzene (%)						98.00			
Ag (mg/L)	0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.02	<0.01		<0.01	<0.01	0.01	0.02	0.02
Alkalinity as CaCO3 (mg/L)		169.00	198.00		173.00	176.00	135.00	147.00	142.00
As (mg/L)	0.1	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.020	0.020		0.020	0.010	0.010	0.010	0.020
Ba (mg/L)		0.07	0.07		0.08	0.06	0.04	0.06	0.05
Benzene (µg/L)						<0.5			
Ca (mg/L)		67.00	78.00		77.00	83.00	72.00	88.00	79.00
CBOD5 (mg/L)		<1	5.00		4.00	4.00	5.00	<1	3.00
Cd (mg/L)	0.0002*	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		39.000	35.000		31.000	34.000	31.000	31.000	24.000
Co (mg/L)	0.0009	<0.0002	0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
COD (mg/L)		31.00	28.00		37.00	17.00	42.00	32.00	28.00
Conductivity (µmho/cm)		513.00	542.00		507.00	509.00	504.00	559.00	506.00
Cr (mg/L)	0.0089**	<0.001	0.0020		<0.001	<0.001	<0.001	<0.001	<0.001
Cu (mg/L)	0.005	0.0020	0.0020		0.0010	<0.001	0.0010	0.0010	0.0010
Dichloromethane (µg/L)						<4.0			
DOC (mg/L)		13.80	12.70		11.50	9.20	12.20	12.50	12.50
Fe (mg/L)	0.3	0.300	0.320		0.250	0.120	0.210	0.180	0.190
Filtration		Y	Y		Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		200.00	236.00		233.00	248.00	213.00	261.00	234.00
Hg (mg/L)	0.0002	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		2.00	2.00		5.00	2.00	2.00	2.00	1.00
Mg (mg/L)		8.00	10.00		10.00	10.00	8.00	10.00	9.00
Mn (mg/L)		0.05	0.07		0.07	0.01	0.02	0.04	0.06
Na (mg/L)		25.00	21.00		14.00	18.00	19.00	16.00	12.00
N-NH3 (mg/L)		0.040	0.031		0.060	0.025	0.023	<0.010	0.541
H3 (Unionized - calculated) (n	0.02		0.0013		0.0029	0.0012	0.0002	NA	0.0056
N-NO2 (mg/L)		<0.10	<0.10		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		3.240	0.960		0.540	1.320	1.970	6.150	4.310
P - Total (mg/L)	0.03*	0.060	0.065		0.050	0.018	0.029	0.016	0.017
Pb (mg/L)	0.025	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.26	8.71		8.16	8.35	7.86	8.28	7.95
Phenols (mg/L)	0.001	<0.001	<0.001		0.0050	<0.001	<0.001	<0.001	<0.001
Se (mg/L)	0.1	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		41.00	35.00		39.00	44.00	64.00	66.00	71.00
TDS (COND - CALC) (mg/L)		333.00	352.00		330.00	331.00	328.00	363.00	329.00
Toluene (µg/L)						<0.5			
Toluene-d8 (%)						95.00			
Total Kjeldahl Nitrogen (mg/L)		1.05	0.87		0.80	0.62	0.69	0.98	0.60
Total P - Soluble (mg/L)		0.04	0.05		0.01	0.01	0.02	0.01	0.01
Total Suspended Solids (mg/L)		7.00	3.00		3.00	<2	5.00	4.00	3.00
Vinyl Chloride (µg/L)						<0.2			
Zn (mg/L)	0.03	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Field Data									
Temperature				17.00	18.30		8.80	6.40	0.43
pH	6.5-8.5	7.97		7.97	metre failure		7.80	7.28	8.09
Conductivity		545.00		427.00	metre failure		516.00	565.00	243.00
Dissolved Oxygen (mg/L)		8.63		6.80	5.01		9.15	10.47	11.21
NA = not applicable									
	Meets PWQO								
	Exceeds PW								
	Meets CCME								
	Exceeds CCM								

SWFD4 2019-2020									
stimated Stream Flow (L/sec)		11.09	0.93	242.29	120.10	19.97	12.90	13.04	65.20
fluent Discharge Rate (L/sec)		NA	NA	NA	NA	NA	NA	NA	NA
LAB ID:		1475063.00	1480017.00	1485319.00	1487992.00	1492679.00	1493691.00	1507650.00	1508125.00
Station Name		SWFD4	SWFD4	SWFD4	SWFD4	SWFD4	SWFD4	SWFD4	SWFD4
Sample Date		2020-01-10	2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04
Analyte	PWQO								
1,2-dichloroethane-d4 (%)		95.00			105.00			110.00	
1,4-dichlorobenzene (µg/L)		<0.4			<0.4			<0.4	
4-bromofluorobenzene (%)		101.00			106.00			90.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.06	<0.01	0.02	0.02	0.02	0.02	0.07	0.12
Alkalinity as CaCO3 (mg/L)		167.00	152.00	114.00	124.00	146.00	146.00	154.00	164.00
As (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.020	0.020	0.010	0.010	0.020	0.020	0.020	0.020
Ba (mg/L)		0.05	0.05	0.04	0.04	0.04	0.04	0.08	0.08
Benzene (µg/L)		<0.5			<0.5			<0.5	
Ca (mg/L)		87.00	77.00	53.00	61.00	67.00	65.00	70.00	80.00
CBOD5 (mg/L)		2.00	5.00	6.00	2.00	2.00	4.00	6.00	3.00
Cd (mg/L)	0.0002*	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		25.000	21.000	21.000	19.000	19.000	19.000	37.000	34.000
Co (mg/L)	0.0009	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0005	0.0004
COD (mg/L)		34.00	25.00	27.00	28.00	30.00	30.00	41.00	30.00
Conductivity (µmho/cm)		529.00	463.00	348.00	376.00	407.00	414.00	499.00	520.00
Cr (mg/L)	0.0089**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0010	0.0010
Cu (mg/L)	0.005	0.0010	<0.001	0.0010	0.0010	<0.001	<0.001	0.0050	0.0020
Dichloromethane (µg/L)		<4.0			<4.0			<4.0	
DOC (mg/L)		11.20	11.40	9.10	12.80	13.50	13.20	16.80	14.50
Fe (mg/L)	0.3	0.300	0.390	0.420	0.240	0.320	0.310	0.910	0.670
Filtration		Y	Y	Y		Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		258.00	229.00	153.00	177.00	200.00	191.00	204.00	237.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		1.00	1.00	1.00	1.00	1.00	1.00	2.00	3.00
Mg (mg/L)		10.00	9.00	5.00	6.00	8.00	7.00	7.00	9.00
Mn (mg/L)		0.09	0.13	0.08	0.04	0.08	0.07	0.16	0.08
Na (mg/L)		12.00	12.00	15.00	10.00	11.00	11.00	25.00	17.00
N-NH3 (mg/L)		0.015	0.048	0.107	0.011	<0.010	<0.010	<0.010	0.143
H3 (Unionized - calculated) (n	0.02	0.0002	0.0007	0.0011	0.0001	NC	NC	NC	0.0240
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		3.310	1.250	2.460	2.880	1.760	1.540	0.630	2.410
P - Total (mg/L)	0.03*	0.019	0.026	0.083	0.026	0.019	0.020	0.102	0.085
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	7.87	8.17	7.90	7.96	8.15	8.30	8.10	8.08
Phenols (mg/L)	0.001	0.0020	<0.001	0.0030	<0.001	<0.001	0.0040	0.0030	0.0050
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		72.00	59.00	25.00	26.00	36.00	37.00	46.00	45.00
TDS (COND - CALC) (mg/L)		344.00	301.00	226.00	244.00	265.00	269.00	324.00	338.00
Toluene (µg/L)		<0.5			<0.5			<0.5	
Toluene-d8 (%)		105.00			104.00			100.00	
Total Kjeldahl Nitrogen (mg/L)		1.04	0.87	1.31	1.48	0.79	0.93	1.31	1.39
Total P - Soluble (mg/L)		0.01	0.01	0.02	0.01	0.01	0.01	0.03	<0.020
Total Suspended Solids (mg/L)		18.00	12.00	53.00	6.00	26.00	10.00	52.00	120.00
Vinyl Chloride (µg/L)		<0.2			<0.2			<0.2	
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data									
Temperature		0.00	-0.10	1.00	7.40	4.80	10.40	21.77	18.80
pH	6.5-8.5	8.15	8.25	8.08	7.61	8.61	8.33	8.65	8.75
Conductivity		527.00	267.00	331.00	363.00	415.00	404.00	472.00	496.00
Dissolved Oxygen (mg/L)		11.99	14.42	11.02	12.41	12.00	15.44	5.78	6.35
NA = not applicable									
	Meets PWQO								
	Exceeds PW								
	Meets CCME								
	Exceeds CCM								

SWFD4 2019-2020					
stimated Stream Flow (L/sec)		8.26	50.53	38.23	30.14
fluent Discharge Rate (L/sec)		NA	NA	NA	NA
LAB ID:		1513033.00	1521861.00	1526422.00	1533876.00
Station Name		SWFD4	SWFD4	SWFD4	SWFD4
Sample Date		2020-08-26	2020-10-13	2020-11-03	2020-12-09
Analyte	PWQO				
1,2-dichloroethane-d4 (%)				90.00	
1,4-dichlorobenzene (µg/L)				<0.4	
4-bromofluorobenzene (%)				105.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.02	0.07	0.01	0.01
Alkalinity as CaCO3 (mg/L)		180.00	192.00	177.00	163.00
As (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.020	0.020	0.020	0.020
Ba (mg/L)		0.07	0.07	0.05	0.05
Benzene (µg/L)				<0.5	
Ca (mg/L)		76.00	82.00	87.00	90.00
CBOD5 (mg/L)		5.00	6.00	3.00	3.00
Cd (mg/L)	0.0002*	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		40.000	24.000		27.000
Co (mg/L)	0.0009	<0.0002	<0.0002	<0.0002	<0.0002
COD (mg/L)		27.00	27.00	27.00	37.00
Conductivity (µmho/cm)		546.00	517.00	559.00	538.00
Cr (mg/L)	0.0089**	<0.001	<0.001	<0.001	<0.001
Cu (mg/L)	0.005	0.0010	<0.001	<0.001	0.0010
Dichloromethane (µg/L)				<4.0	
DOC (mg/L)		11.30	11.70	12.50	12.60
Fe (mg/L)	0.3	0.270	0.320	0.200	0.260
Filtration		Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		227.00	242.00	258.00	266.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		2.00	4.00	2.00	1.00
Mg (mg/L)		9.00	9.00	10.00	10.00
Mn (mg/L)		0.05	0.08	0.06	0.08
Na (mg/L)		26.00	11.00	15.00	11.00
N-NH3 (mg/L)		0.050	<0.010	<0.010	<0.010
H3 (Unionized - calculated) (n	0.02	0.0032	N/A	N/A	N/A
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		1.520	1.630	4.150	7.190
P - Total (mg/L)	0.03*	0.050	0.039	0.014	0.015
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.23	8.07	8.13	8.23
Phenols (mg/L)	0.001	0.0030	0.0070	<0.001	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		40.00	36.00	58.00	57.00
TDS (COND - CALC) (mg/L)		355.00	336.00	363.00	350.00
Toluene (µg/L)				<0.5	
Toluene-d8 (%)				91	
Total Kjeldahl Nitrogen (mg/L)		<0.8	0.72	1.56	1.14
Total P - Soluble (mg/L)		0.03	0.04	0.01	0.01
Total Suspended Solids (mg/L)		9.00	8.00	4.00	5.00
Vinyl Chloride (µg/L)				<0.2	
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01
Field Data					
Temperature		14.00	10.10	3.01	1.60
pH	6.5-8.5	8.43	8.74	9.17	7.83
Conductivity		545.00	495.00	503.00	509.00
Dissolved Oxygen (mg/L)		9.02	9.84	11.24	13.63
NA = not applicable					
	Meets PWQO				
	Exceeds PW				
	Meets CCME				
	Exceeds CCM				

SWD2 2019-2020			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)		
LAB ID:						**1428328.00**	**1431586.00**
Date Sampled:						**2019-05-23**	**2019-06-06**
Station Name						**SWD2**	**SWD2**
Analyte	**PWQO**	**MRL**					
1,2-dichloroethane-d4 (%)						101.00	106.00
1,4-dichlorobenzene (µg/L)			4			<0.4	<0.4
4-bromofluorobenzene (%)						92.00	115.00
Ag (mg/L)	0.0001	0.0001				<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01				<0.01	<0.01
Alkalinity as CaCO3 (mg/L)		5				180.00	221.00
As (mg/L)	0.1	0.001				0.00	0.00
B (mg/L)	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.19	0.18
Ba (mg/L)		0.01				0.03	0.03
Benzene (µg/L)			100	ND/370	ND/40	<0.5	<0.5
Ca (mg/L)		1				85.00	84.00
CBOD5 (mg/L)		1				4.00	4.00
Cd (mg/L)	0.0002	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001
Cl (mg/L)		1		640/120	600/150	24.00	28.00
Co (mg/L)	0.0009	0.0002			0.110/0.004	<0.0002	<0.0002
COD (mg/L)		5				74.00	78.00
Conductivity (µmho/cm)		5				500.00	540.00
Cr (mg/L)	0.0089**	0.001	0.0089	ND/.001		<0.001	<0.001
Cu (mg/L)	0.005	0.001		ND/.004	0.029/≤0.002	<0.001	<0.001
Dichloromethane (µg/L)			100	ND/9811		<4.0	<4.0
DOC (mg/L)		0.50				30.50	31.50
Fe (mg/L)	0.3	0.03	0.3	ND/0.3	0.001/ND	0.04	0.08
Filtration						Y	Y
Hardness as CaCO3 (mg/L)		1				266.00	267.00
Hg (mg/L)	0.0002	0.0001	0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001
K (mg/L)		1				4.00	4.00
Mg (mg/L)		1				13.00	14.00
Mn (mg/L)		0.01				0.04	0.17
Na (mg/L)		2	180			24.00	23.00
N-NH3 (mg/L)		0.02				0.04	0.08
NH3 (Unionized - calculated)	0.02		0.0200				
N-NO2 (mg/L)		0.10			0.6/0.2	<0.10	<0.10
N-NO3 (mg/L)		0.10		124/3.0	32.8/3.0	0.12	0.23
P - Total (mg/L)	0.03*	0.01	0.030			0.936	1.300
Pb (mg/L)	0.025	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001
pH	6.5-8.5					8.03	8.03
Phenols (mg/L)	0.001	0.001	0.0010	ND/0.004	.050/ND	<0.001	<0.001
Se (mg/L)	0.1	0.001				<0.001	<0.001
SO4 (mg/L)		1			429	82.00	68.00
TDS (COND - CALC) (mg/L)		5				325.00	351.00
Toluene (µg/L)			0.8	ND/.002	ND/0.0005	<0.5	<0.5
Toluene-d8 (%)						100.00	105.00
Total Kjeldahl Nitrogen (mg/L)		0.10				1.60	2.00
Total P - Soluble (mg/L)						0.89	1.21
Total Suspended Solids (mg/L)		2	600			4.00	7.00
Zn (mg/L)	0.03	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01
Field Data							
Temperature						18.30	19.70
pH	6.5-8.5					8.07	7.72
Conductivity						508.00	629.00
Dissolved Oxygen (mg/L)							
	Meets PWQO						
	Exceeds PWQO						
	Meets CCME or MOE BC long term guideline						
	Exceeds CCME or MOE BC long term guideline						

SWD2 2019-2020							
LAB ID:		**1434219.00**	**1440943.00**	**1446258.00**		**1455465.00**	**1460891.00**
Date Sampled:		**2019-06-19**	**2019-07-12**	**2019-08-08**	**2019-09-04**	**2019-09-23**	**2019-10-18**
Station Name		**SWD2**	**SWD2**	**SWD2**	**SWD2**	**SWD2**	**SWD2**
Analyte	**PWQO**						
1,2-dichloroethane-d4 (%)							
1,4-dichlorobenzene (µg/L)							
4-bromofluorobenzene (%)							
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.001		<0.001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01	0.02	<0.01		<0.01	<0.01
Alkalinity as CaCO3 (mg/L)		252.00	248.00	458.00		185.00	326.00
As (mg/L)	0.1	0.00	0.00	<0.01		<0.01	0.00
B (mg/L)	0.2*	0.21	0.29	0.20		0.20	0.20
Ba (mg/L)		0.04	0.07	0.10		0.20	0.06
Benzene (µg/L)							
Ca (mg/L)		96.00	84.00	166.00		86.00	154.00
CBOD5 (mg/L)		2.00	<1	34.00		8.00	10.00
Cd (mg/L)	0.0002	<0.0001	0.00	<0.001		<0.001	<0.0001
Cl (mg/L)		34.00	43.00	177.00		66.00	122.00
Co (mg/L)	0.0009	<0.0002	0.0006	<0.002		0.0060	<0.0002
COD (mg/L)		89.00	220.00	120.00		86.00	71.00
Conductivity (µmho/cm)		672.00	696.00	1400.00		641.00	1240.00
Cr (mg/L)	0.0089**	<0.001	0.0010	<0.01		0.0100	<0.001
Cu (mg/L)	0.005	<0.001	0.004	<0.01		0.020	0.001
Dichloromethane (µg/L)							
DOC (mg/L)		36.00	45.00	36.80		15.70	30.10
Fe (mg/L)	0.3	0.12	0.86	0.70		6.40	0.66
Filtration		Y	Y	Y		Y	Y
Hardness as CaCO3 (mg/L)		301.00	263.00	522.00		264.00	483.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001		<0.001	<0.0001
K (mg/L)		4.00	9.00	13.00		8.00	11.00
Mg (mg/L)		15.00	13.00	26.00		12.00	24.00
Mn (mg/L)		0.22	0.38	1.20		0.60	0.23
Na (mg/L)		32.00	43.00	80.00		32.00	67.00
N-NH3 (mg/L)		0.12	0.39	0.02		0.82	0.20
NH3 (Unionized - calculated)	0.02			0.0003		0.0161	0.0013
N-NO2 (mg/L)		<0.10	0.21	<0.10		<0.10	<0.10
N-NO3 (mg/L)		0.25	0.79	<0.10		<0.10	9.33
P - Total (mg/L)	0.03*	1.640	1.730	0.740		1.000	0.725
Pb (mg/L)	0.025	<0.001	0.005	<0.01		0.030	<0.001
pH	6.5-8.5	8.00	8.15	8.32		7.68	7.63
Phenols (mg/L)	0.001	<0.001	<0.001	<0.001		0.0060	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.01		<0.01	<0.001
SO4 (mg/L)		61.00	59.00	35.00		45.00	109.00
TDS (COND - CALC) (mg/L)		437.00	452.00	910.00		417.00	806.00
Toluene (µg/L)							
Toluene-d8 (%)							
Total Kjeldahl Nitrogen (mg/L)		1.99	5.39	6.30		8.20	2.41
Total P - Soluble (mg/L)		1.61	1.56	0.23		0.26	0.62
Total Suspended Solids (mg/L)		7.00	119.00	58.00		489.00	14.00
Zn (mg/L)	0.03	<0.01	0.01	<0.1		<0.1	0.02
Field Data							
Temperature		26.00	22.00	20.60	19.20		8.50
pH	6.5-8.5	7.58	7.70	7.48	7.62		7.62
Conductivity		701.00	738.00	1500.00	860.00		1230.00
Dissolved Oxygen (mg/L)							
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWD2 2019-2020							
LAB ID:		**1464891.00**	**1471801.00**	**1480016.00**	**1485317.00**	**1487990.00**	**1492678.00**
Date Sampled:		**2019-11-06**	**2019-12-11**	**2020-02-14**	**2020-03-17**	**2020-04-07**	**2020-05-08**
Station Name		**SWD2**	**SWD2**	**SWD2**	**SWD2**	**SWD2**	**SWD2**
Analyte	**PWQO**						
1,2-dichloroethane-d4 (%)						107.00	
1,4-dichlorobenzene (µg/L)						<0.4	
4-bromofluorobenzene (%)						99.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Alkalinity as CaCO3 (mg/L)		129.00	171.00	353.00	82.00	151.00	233.00
As (mg/L)	0.1	0.00	0.00	0.00	0.00	0.00	0.00
B (mg/L)	0.2*	0.25	0.24	0.23	0.10	0.14	0.16
Ba (mg/L)		0.03	0.03	0.05	0.02	0.03	0.03
Benzene (µg/L)						<0.5	
Ca (mg/L)		91.00	89.00	131.00	38.00	77.00	91.00
CBOD5 (mg/L)		3.00	2.00	6.00	6.00	1.00	<1
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		18.00	25.00	75.00	13.00	14.00	25.00
Co (mg/L)	0.0009	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002
COD (mg/L)		90.00	106.00	141.00	141.00	169.00	91.00
Conductivity (µmho/cm)		599.00	626.00	967.00	282.00	512.00	655.00
Cr (mg/L)	0.0089**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cu (mg/L)	0.005	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Dichloromethane (µg/L)						<4.0	
DOC (mg/L)		39.90	35.00	20.90	17.90	27.60	32.80
Fe (mg/L)	0.3	0.05	0.24	0.68	0.20	0.28	0.09
Filtration		Y	Y	Y	Y		Y
Hardness as CaCO3 (mg/L)		281.00	280.00	418.00	115.00	238.00	289.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		6.00	5.00	5.00	3.00	3.00	5.00
Mg (mg/L)		13.00	14.00	22.00	5.00	11.00	15.00
Mn (mg/L)		0.02	0.07	0.92	0.10	0.14	0.14
Na (mg/L)		19.00	24.00	54.00	14.00	18.00	35.00
N-NH3 (mg/L)		0.02	0.19	0.83	0.49	0.41	1.57
NH3 (Unionized - calculated)	0.02	0.0001	0.0029	0.0027	0.0055	0.0021	0.0541
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		5.63	2.17	0.45	0.90	1.40	1.77
P - Total (mg/L)	0.03*	1.010	1.040	0.284	0.757	0.798	0.973
Pb (mg/L)	0.025	<0.001	<0.001	0.002	0.001	<0.001	<0.001
pH	6.5-8.5	8.02	7.41	7.59	7.51	7.47	7.90
Phenols (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	0.0020	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		122.00	108.00	75.00	36.00	65.00	72.00
TDS (COND - CALC) (mg/L)		389.00	407.00	629.00	183.00	333.00	426.00
Toluene (µg/L)						<0.5	
Toluene-d8 (%)						104.00	
Total Kjeldahl Nitrogen (mg/L)		2.67	2.70	3.90	3.96	6.43	6.21
Total P - Soluble (mg/L)		1.00	0.99	0.08	0.59	0.73	0.80
Total Suspended Solids (mg/L)		7.00	24.00	49.00	134.00	109.00	44.00
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data							
Temperature		4.00	0.26	-0.10		8.80	4.50
pH	6.5-8.5	7.38	8.28	7.60		7.48	8.48
Conductivity		523.00	606.00	176.00		513.00	653.00
Dissolved Oxygen (mg/L)				13.75		5.68	11.92
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWD2 2019-2020		
LAB ID:		**1533875.00**
Date Sampled:		**2020-12-09**
Station Name		**SWD2**
Analyte	**PWQO**	
1,2-dichloroethane-d4 (%)		
1,4-dichlorobenzene (µg/L)		
4-bromofluorobenzene (%)		
Ag (mg/L)	0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01
Alkalinity as CaCO3 (mg/L)		176.00
As (mg/L)	0.1	0.00
B (mg/L)	0.2*	0.19
Ba (mg/L)		0.03
Benzene (µg/L)		
Ca (mg/L)		101.00
CBOD5 (mg/L)		3.00
Cd (mg/L)	0.0002	<0.0001
Cl (mg/L)		20.00
Co (mg/L)	0.0009	<0.0002
COD (mg/L)		48.00
Conductivity (µmho/cm)		636.00
Cr (mg/L)	0.0089**	<0.001
Cu (mg/L)	0.005	<0.001
Dichloromethane (µg/L)		
DOC (mg/L)		34.50
Fe (mg/L)	0.3	0.07
Filtration		Y
Hardness as CaCO3 (mg/L)		314.00
Hg (mg/L)	0.0002	<0.0001
K (mg/L)		5.00
Mg (mg/L)		15.00
Mn (mg/L)		0.07
Na (mg/L)		22.00
N-NH3 (mg/L)		0.33
NH3 (Unionized - calculated)	0.02	0.0024
N-NO2 (mg/L)		<0.10
N-NO3 (mg/L)		1.87
P - Total (mg/L)	0.03*	1.080
Pb (mg/L)	0.025	0.008
pH	6.5-8.5	7.62
Phenols (mg/L)	0.001	0.0020
Se (mg/L)	0.1	<0.001
SO4 (mg/L)		120.00
TDS (COND - CALC) (mg/L)		413.00
Toluene (µg/L)		
Toluene-d8 (%)		
Total Kjeldahl Nitrogen (mg/L)		2.52
Total P - Soluble (mg/L)		1.02
Total Suspended Solids (mg/L)		6.00
Zn (mg/L)	0.03	<0.01
Field Data		
Temperature		0.20
pH	6.5-8.5	7.95
Conductivity		584.00
Dissolved Oxygen (mg/L)		8.97
	Meets PW	
	Exceeds P	
	Meets CC	
	Exceeds C	

SWT1 2019-2020							
Measured / Estimated Flow (L/sec)					CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)	2.30
			Regulated Effluent				0.00
LAB ID:							1428324.00
Station			mg/L	PWQO (APV for Cl and Na)			SWT1
Date Sampled:							2019-05-23
Analyte	PWQO	MRL					
1,2-dichloroethane-d4 (%)							97.00
1,4-dichlorobenzene (µg/L)							<0.4
4-bromofluorobenzene (%)				4			93.00
Ag (mg/L)	0.0001	0.0001					<0.0001
Al (dissolved) (mg/L)	0.075*	0.01					<0.01
Alkalinity as CaCO3 (mg/L)		5					387.00
As (mg/L)	0.1	0.001					0.001
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.13
Ba (mg/L)		0.01					0.05
Benzene (µg/L)				100	ND/370	ND/40	<0.5
Ca (mg/L)		1					148.00
CBOD5 (mg/L)		1	10.0				3.00
Cd (mg/L)	0.0002	0.0001		0.0002	.001/.00009	calculation	<0.0001
Cl (mg/L)		1			640/120	600/150	147.00
Co (mg/L)	0.0009	0.0002				0.110/0.004	<0.0002
COD (mg/L)		5					36.00
Conductivity (µmho/cm)		5					1330.00
Cr (mg/L)	0.0089**	0.001		0.0089	ND/.001		0.0010
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.0020
Dichloromethane (µg/L)				100	ND/9811		<4.0
DOC (mg/L)		0.50					13.00
Fe (mg/L)	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.07
Filtration							Y
Hardness as CaCO3 (mg/L)		1					534.00
Hg (mg/L)	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001
K (mg/L)		1					9.00
Mg (mg/L)		1					40.00
Mn (mg/L)		0.01					0.02
Na (mg/L)		2		180			107.00
N-NH3 (mg/L)		0.02	1.0				0.04
3 (Unionized - calculated) (	0.02			0.0200			
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	3.38
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.302
Pb (mg/L)	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001
pH	6.5-8.5						8.22
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.003
Se (mg/L)	0.1	0.001					<0.001
SO4 (mg/L)		1				429	182.00
TDS (COND - CALC) (mg/L)		5					864.00
Toluene (µg/L)				0.8	ND/.002	ND/0.0005	<0.5
Toluene-d8 (%)							95.00
otal Kjeldahl Nitrogen (mg/L)		0.10					1.60
Total P - Soluble (mg/L)							0.22
otal Suspended Solids (mg/L)		2	10.0	600			14.00
Vinyl Chloride (µg/L)							<0.2
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01
Field Data							
Temperature							13.70
pH	6.5-8.5						7.63
Conductivity							1158.00
Dissolved Oxygen (mg/L)			>4				8.73
	Meets PWQO						
	Exceeds PWQO						
	Meets CCME or MOE BC long term guideline						
	Exceeds CCME or MOE BC long term guideline						

SWT1 2019-2020							
Measured / Estimated Flow (L/sec)		**2.10**		**17.00**	**4.60**		
		0.00	**0.00**	**0.00**	**0.00**		
LAB ID:		**1431588.00**		**1464893.00**	**1471809.00**	**1485314.00**	**1487987.00**
Station		**SWT1**	**SWT1**	**SWT1**	**SWT1**	**SWT1**	**SWT1**
Date Sampled:		**2019-06-06**	**2019-09-04**	**2019-11-06**	**2019-12-11**	**2020-03-17**	**2020-04-07**
Analyte	PWQO						
1,2-dichloroethane-d4 (%)		96.00					103.00
1,4-dichlorobenzene (µg/L)		<0.4					<0.4
4-bromofluorobenzene (%)		112.00					106.00
Ag (mg/L)	0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01		<0.01	0.02	0.02	<0.01
Alkalinity as CaCO3 (mg/L)		359.00		296.00	254.00	201.00	261.00
As (mg/L)	0.1	0.001		<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.14		0.13	0.09	0.04	0.08
Ba (mg/L)		0.05		0.06	0.06	0.03	0.05
Benzene (µg/L)		<0.5					<0.5
Ca (mg/L)		133.00		151.00	122.00	72.00	130.00
CBOD5 (mg/L)		8.00		1.00	5.00	42.00	3.00
Cd (mg/L)	0.0002	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		201.00		72.00	23.00	105.00	75.00
Co (mg/L)	0.0009	<0.0002		<0.0002	0.0003	0.0007	<0.0002
COD (mg/L)		31.00		40.00	50.00	115.00	46.00
Conductivity (µmho/cm)		1430.00		1240.00	1160.00	827.00	1040.00
Cr (mg/L)	0.0089**	<0.001		<0.001	0.0010	<0.001	<0.001
Cu (mg/L)	0.005	0.0020		0.0030	0.0060	0.0030	0.0030
Dichloromethane (µg/L)		<4.0					<4.0
DOC (mg/L)		11.80		19.10	17.70	19.60	19.90
Fe (mg/L)	0.3	0.12		0.12	0.40	0.24	0.16
Filtration		Y		Y	Y	Y	
Hardness as CaCO3 (mg/L)		509.00		521.00	424.00	229.00	436.00
Hg (mg/L)	0.0002	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		9.00		8.00	7.00	8.00	5.00
Mg (mg/L)		43.00		35.00	29.00	12.00	27.00
Mn (mg/L)		0.12		0.01	0.03	0.30	0.03
Na (mg/L)		140.00		63.00	72.00	69.00	55.00
N-NH3 (mg/L)		0.04		<0.010	0.16	5.71	0.30
3 (Unionized - calculated) (	0.02				0.0048	0.0298	0.0004
N-NO2 (mg/L)		<0.10		<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		0.34		8.09	4.22	0.42	4.10
P - Total (mg/L)	0.03*	0.352		0.123	0.295	2.080	0.197
Pb (mg/L)	0.025	<0.001		<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.11		8.27	7.79	7.65	7.85
Phenols (mg/L)	0.001	<0.001		<0.001	0.007	0.010	<0.001
Se (mg/L)	0.1	<0.001		0.00	<0.001	<0.001	<0.001
SO4 (mg/L)		183.00		213.00	36.00	50.00	162.00
TDS (COND - CALC) (mg/L)		930.00		806.00	754.00	538.00	676.00
Toluene (µg/L)		<0.5					<0.5
Toluene-d8 (%)		105.00					104.00
otal Kjeldahl Nitrogen (mg/L)		1.74		1.62	2.00	13.80	2.93
Total P - Soluble (mg/L)		0.27		0.12	12.00	1.48	0.20
otal Suspended Solids (mg/L)		44.00		3.00	0.13	30.00	19.00
Vinyl Chloride (µg/L)		<0.2					<0.2
Zn (mg/L)	0.03	<0.01		<0.01	<0.01	<0.01	<0.01
Field Data							
Temperature		21.70	23.50	6.20	0.23	0.80	5.80
pH	6.5-8.5	7.89	7.82	7.46	8.58	7.78	7.03
Conductivity		1602.00	767.00	1202.00	1106.00	788.00	990.00
Dissolved Oxygen (mg/L)		20.28	5.10	10.68	meter frozen	4.08	11.62
	Meets PWQO						
	Exceeds PWQ						
	Meets CCME o						
	Exceeds CCME						

SWT1 2019-2020		
Measured / Estimated Flow (L/sec)		
LAB ID:		**1533871.00**
Station		**SWT1**
Date Sampled:		**2020-12-09**
Analyte	PWQO	
1,2-dichloroethane-d4 (%)		
1,4-dichlorobenzene (µg/L)		
4-bromofluorobenzene (%)		
Ag (mg/L)	0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01
Alkalinity as CaCO3 (mg/L)		365.00
As (mg/L)	0.1	<0.001
B (mg/L)	0.2*	0.14
Ba (mg/L)		0.06
Benzene (µg/L)		
Ca (mg/L)		171.00
CBOD5 (mg/L)		3.00
Cd (mg/L)	0.0002	<0.0001
Cl (mg/L)		79.00
Co (mg/L)	0.0009	0.0002
COD (mg/L)		61.00
Conductivity (µmho/cm)		1270.00
Cr (mg/L)	0.0089**	<0.001
Cu (mg/L)	0.005	0.0020
Dichloromethane (µg/L)		
DOC (mg/L)		20.30
Fe (mg/L)	0.3	0.22
Filtration		Y
Hardness as CaCO3 (mg/L)		588.00
Hg (mg/L)	0.0002	<0.0001
K (mg/L)		6.00
Mg (mg/L)		39.00
Mn (mg/L)		0.03
Na (mg/L)		62.00
N-NH3 (mg/L)		<0.010
3 (Unionized - calculated) (	0.02	
N-NO2 (mg/L)		<0.10
N-NO3 (mg/L)		5.86
P - Total (mg/L)	0.03*	0.198
Pb (mg/L)	0.025	<0.001
pH	6.5-8.5	8.12
Phenols (mg/L)	0.001	0.004
Se (mg/L)	0.1	<0.001
SO4 (mg/L)		218.00
TDS (COND - CALC) (mg/L)		826.00
Toluene (µg/L)		
Toluene-d8 (%)		
otal Kjeldahl Nitrogen (mg/L)		1.95
Total P - Soluble (mg/L)		0.16
otal Suspended Solids (mg/L)		20.00
Vinyl Chloride (µg/L)		
Zn (mg/L)	0.03	<0.01
Field Data		
Temperature		0.50
pH	6.5-8.5	7.61
Conductivity		1173.00
Dissolved Oxygen (mg/L)		10.53
	Meets PWQO	
	Exceeds PWQ	
	Meets CCME o	
	Exceeds CCME	

SWAF1 2019-2020								
			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)			
Measured / Estimated Flow (L/sec)						**71.00**	**21.00**	**32.00**
Effluent Discharge (L/sec)						**NA**	**NA**	**NA**
Lab ID						**1428333.00**	**1431591.00**	**1434216.00**
Station Name						**SWAF1**	**SWAF1**	**SWAF1**
Sample Date						**2019-05-23**	**2019-06-06**	**2019-06-19**
Analyte	**Units**	**MRL**						
1,2-dichloroethane-d4 (%)	%	0.00				99.00	105.00	
1,4-dichlorobenzene (µg/L)	ug/L	0.40	4.00			<0.4	<0.4	
4-bromofluorobenzene (%)	%	0.00				94.00	119.00	
Ag (mg/L)	mg/L	0.00				<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.01				0.02	<0.01	0.01
Alkalinity as CaCO3 (mg/L)	mg/L	5.00				137.00	134.00	236.00
As (mg/L)	mg/L	0.00				0.00	0.00	0.00
B (mg/L)	mg/L	0.010	0.2*	29/1.5	ND/1.2	0.100	0.100	0.160
Ba (mg/L)	mg/L	0.01				0.03	0.03	0.04
Benzene (µg/L)	ug/L	0.50	100.00	ND/370	ND/40	<0.5	<0.5	
Ca (mg/L)	mg/L	1.00				36.00	36.00	54.00
CBOD5 (mg/L)	mg/L	1.00				3.00	2.00	3.00
Cd (mg/L)	mg/L	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	1.00		640/120	600/150	3.00	8.00	9.00
Co (mg/L)	mg/L	0.0002			0.110/0.004	0.0014	0.0008	0.0005
COD (mg/L)	mg/L	5.00				62.00	69.00	52.00
Conductivity (µmho/cm)	uS/cm	5.00				286.00	272.00	562.00
Cr (mg/L)	mg/L	0.0010	0.0089	ND/.001		0.0060	0.0020	0.0020
Cu (mg/L)	mg/L	0.0010		ND/.004	0.029/≤0.002	0.0040	0.0030	0.0020
Dichloromethane (µg/L)	ug/L	4.00	100.00	ND/9811		<4.0	<4.0	
DOC (mg/L)	mg/L	0.50				20.90	24.70	22.00
Fe (mg/L)	mg/L	0.030	0.300	ND/0.3	0.001/ND	2.110	1.160	0.840
Filtration						Y	Y	Y
Hardness as CaCO3 (mg/L)	mg/L	1.00				119.00	119.00	192.00
Hg (mg/L)	mg/L	0.0001	0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	1.00				2.00	2.00	4.00
Mg (mg/L)	mg/L	1.00				7.00	7.00	14.00
Mn (mg/L)	mg/L	0.01				0.08	0.23	0.21
Na (mg/L)	mg/L	2.00	180.00			21.00	17.00	52.00
N-NH3 (mg/L)	mg/L	0.01				0.21	0.18	0.95
NH3 (Unionized - calculated) (mg/L)			0.020					
N-NO2 (mg/L)	mg/L	0.10			0.6/0.2	<0.10	<0.10	0.11
N-NO3 (mg/L)	mg/L	0.10		124/3.0	32.8/3.0	1.07	1.12	2.36
P - Total (mg/L)	mg/L	0.002	0.030			0.147	0.226	0.226
Pb (mg/L)	mg/L	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001
pH		1.00				8.06	7.99	8.05
Phenols (mg/L)	mg/L	0.0010	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001
Se (mg/L)	mg/L	0.00				<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	1.00			429.00	17.00	13.00	39.00
TDS (COND - CALC) (mg/L)	mg/L	1.00				186.00	177.00	365.00
Toluene (µg/L)	ug/L	0.50	0.80	ND/.002	ND/0.0005	<0.5	<0.5	
Toluene-d8 (%)	%	0.00				97.00	103.00	
Total Kjeldahl Nitrogen (mg/L)	mg/L	0.15				1.30	1.57	2.14
Total P - Soluble (mg/L)	mg/L	0.00				0.03	0.10	0.16
Total Suspended Solids (mg/L)	mg/L	2.00				164.00	119.00	35.00
Vinyl Chloride (µg/L)	ug/L	0.20	600.00			<0.2	<0.2	
Zn (mg/L)	mg/L	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01
Field Data								
Temperature (ºC)						15.40	25.50	19.60
pH (field) (pH units)						7.93	8.58	7.35
Conductivity (field) (µS/cm)						275.80	323.00	552.00
Dissolved Oxygen						8.29	10.19	6.53
	Meets PWQO							
	Exceeds PWQO							
	Meets CCME or MOE BC long term guideline							
	Exceeds CCME or MOE BC long term guideline							

SWAF1 2019-2020							
Measured / Estimated Flow (L/sec)		**3.90**	**4.30**	**3.70**	**14.00**	**3.10**	**5.10**
Effluent Discharge (L/sec)		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Lab ID			**1440944.00**	**1446259.00**		**1455466.00**	**1459462.00**
Station Name			**SWAF1**	**SWAF1**		**SWAF1**	**SWAF1**
Sample Date		**2019-7-10**	**2019-07-12**	**2019-08-08**	**2019-9-4**	**2019-09-23**	**2019-10-10**
Analyte	**Units**						
1,2-dichloroethane-d4 (%)	%						94.40
1,4-dichlorobenzene (µg/L)	ug/L						<0.4
4-bromofluorobenzene (%)	%						99.00
Ag (mg/L)	mg/L		<0.0001	<0.0001		<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L		0.02	0.01		<0.01	0.02
Alkalinity as CaCO3 (mg/L)	mg/L		151.00	203.00		175.00	205.00
As (mg/L)	mg/L		0.00	0.00		0.00	<0.001
B (mg/L)	mg/L		0.170	0.130		0.180	0.110
Ba (mg/L)	mg/L		0.03	0.05		0.04	0.03
Benzene (µg/L)	ug/L						<0.5
Ca (mg/L)	mg/L		40.00	50.00		46.00	55.00
CBOD5 (mg/L)	mg/L		<1	3.00		5.00	3.00
Cd (mg/L)	mg/L		<0.0001	<0.0001		<0.0001	<0.0001
Cl (mg/L)	mg/L		3.00	4.00		10.00	8.00
Co (mg/L)	mg/L		0.0007	0.0008		0.0018	0.0012
COD (mg/L)	mg/L		65.00	62.00		65.00	48.00
Conductivity (µmho/cm)	uS/cm		336.00	386.00		366.00	400.00
Cr (mg/L)	mg/L		0.0030	0.0040		0.0050	0.0060
Cu (mg/L)	mg/L		0.0030	0.0040		0.0060	0.0030
Dichloromethane (µg/L)	ug/L						<4.0
DOC (mg/L)	mg/L		30.80	26.20		23.80	20.10
Fe (mg/L)	mg/L		1.060	1.340		2.560	2.020
Filtration			Y	Y		Y	Y
Hardness as CaCO3 (mg/L)	mg/L		133.00	166.00		152.00	183.00
Hg (mg/L)	mg/L		<0.0001	<0.0001		<0.0001	<0.0001
K (mg/L)	mg/L		3.00	2.00		4.00	3.00
Mg (mg/L)	mg/L		8.00	10.00		9.00	11.00
Mn (mg/L)	mg/L		0.04	0.12		0.23	0.06
Na (mg/L)	mg/L		19.00	25.00		29.00	27.00
N-NH3 (mg/L)	mg/L		0.33	0.07		0.15	0.16
NH3 (Unionized - calculated) (mg/L)				0.003		0.005	0.007
N-NO2 (mg/L)	mg/L		<0.10	<0.10		<0.10	<0.10
N-NO3 (mg/L)	mg/L		0.62	0.19		0.24	0.58
P - Total (mg/L)	mg/L		0.119	0.168		0.316	0.125
Pb (mg/L)	mg/L		<0.001	<0.001		0.002	<0.001
pH			8.21	8.54		7.90	8.39
Phenols (mg/L)	mg/L		<0.001	<0.001		0.0040	<0.001
Se (mg/L)	mg/L		<0.001	<0.001		<0.001	<0.001
SO4 (mg/L)	mg/L		23.00	6.00		7.00	13.00
TDS (COND - CALC) (mg/L)	mg/L		218.00	251.00		238.00	260.00
Toluene (µg/L)	ug/L						<0.5
Toluene-d8 (%)	%						94.00
Total Kjeldahl Nitrogen (mg/L)	mg/L		2.05	1.46		2.00	1.02
Total P - Soluble (mg/L)	mg/L		0.06	0.09		0.10	0.06
Total Suspended Solids (mg/L)	mg/L		40.00	38.00		374.00	58.00
Vinyl Chloride (µg/L)	ug/L						<0.2
Zn (mg/L)	mg/L		<0.01	<0.01		0.01	<0.01
Field Data							
Temperature (ºC)		30.90	20.80	24.90	19.60	20.10	9.70
pH (field) (pH units)		8.14	7.92	7.90	8.57	meter failure	8.38
Conductivity (field) (µS/cm)		378.00	355.00	435.00	320.00	meter failure	394.00
Dissolved Oxygen		3.84	5.37	6.03	5.41	5.23	10.46
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds CC						

SWAF1 2019-2020							
Measured / Estimated Flow (L/sec)		**18.00**	**44.00**	**17.00**	**12.11**	**99.41**	**63.39**
Effluent Discharge (L/sec)		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Lab ID		**1460892.00**	**1464896.00**	**1471808.00**	**1475060.00**	**1485313.00**	**1487985.00**
Station Name		**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**
Sample Date		**2019-10-18**	**2019-11-06**	**2019-12-11**	**2020-01-10**	**2020-03-17**	**2020-04-07**
Analyte	**Units**						
1,2-dichloroethane-d4 (%)	%				75.00		109.00
1,4-dichlorobenzene (µg/L)	ug/L				<0.4		<0.4
4-bromofluorobenzene (%)	%				109.00		106.00
Ag (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.10	0.02	0.05	0.03	0.03	0.02
Alkalinity as CaCO3 (mg/L)	mg/L	117.00	169.00	175.00	184.00	106.00	112.00
As (mg/L)	mg/L	0.00	<0.001	0.00	<0.001	<0.001	0.00
B (mg/L)	mg/L	0.210	0.160	0.130	0.140	0.080	0.080
Ba (mg/L)	mg/L	0.03	0.02	0.02	0.02	0.02	0.02
Benzene (µg/L)	ug/L				<0.5		<0.5
Ca (mg/L)	mg/L	44.00	50.00	46.00	52.00	38.00	38.00
CBOD5 (mg/L)	mg/L	9.00	1.00	3.00	3.00	5.00	2.00
Cd (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	6.00	4.00	5.00	7.00	7.00	3.00
Co (mg/L)	mg/L	0.0004	0.0003	0.0004	0.0005	0.0003	0.0004
COD (mg/L)	mg/L	53.00	47.00	41.00	101.00	44.00	52.00
Conductivity (µmho/cm)	uS/cm	401.00	406.00	389.00	391.00	277.00	282.00
Cr (mg/L)	mg/L	0.0020	0.0010	0.0020	0.0020	0.0010	0.0020
Cu (mg/L)	mg/L	0.0030	0.0010	0.0020	0.0020	0.0010	0.0010
Dichloromethane (µg/L)	ug/L				<4.0		<4.0
DOC (mg/L)	mg/L	21.90	20.20	20.60	23.70	16.00	22.20
Fe (mg/L)	mg/L	0.660	0.500	0.680	1.210	0.500	0.690
Filtration		Y	Y	Y	Y	Y	
Hardness as CaCO3 (mg/L)	mg/L	147.00	166.00	156.00	171.00	120.00	124.00
Hg (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	6.00	3.00	3.00	3.00	1.00	2.00
Mg (mg/L)	mg/L	9.00	10.00	10.00	10.00	6.00	7.00
Mn (mg/L)	mg/L	0.03	0.03	0.11	0.12	0.05	0.05
Na (mg/L)	mg/L	26.00	22.00	22.00	20.00	13.00	14.00
N-NH3 (mg/L)	mg/L	0.19	0.33	0.98	0.68	0.46	0.34
NH3 (Unionized - calculated) (mg/L)		0.007	0.010	0.043	0.044	0.007	0.001
N-NO2 (mg/L)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)	mg/L	3.13	1.60	1.10	1.19	1.96	1.85
P - Total (mg/L)	mg/L	0.088	0.064	0.106	0.094	0.064	0.086
Pb (mg/L)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH		7.71	8.28	7.77	7.89	7.82	7.73
Phenols (mg/L)	mg/L	<0.001	<0.001	<0.001	0.0020	<0.001	<0.001
Se (mg/L)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	64.00	32.00	26.00	20.00	23.00	19.00
TDS (COND - CALC) (mg/L)	mg/L	261.00	264.00	253.00	254.00	180.00	183.00
Toluene (µg/L)	ug/L				<0.5		<0.5
Toluene-d8 (%)	%				109.00		106.00
Total Kjeldahl Nitrogen (mg/L)	mg/L	1.81	1.63	1.70	2.65	1.79	2.67
Total P - Soluble (mg/L)	mg/L	0.06	0.05	0.07	0.04	0.02	0.05
Total Suspended Solids (mg/L)	mg/L	29.00	18.00	20.00	21.00	23.00	30.00
Vinyl Chloride (µg/L)	ug/L				<0.2		<0.2
Zn (mg/L)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data							
Temperature (ºC)		8.00	5.10	0.20	0.00	0.70	3.10
pH (field) (pH units)		8.41	8.38	8.74	8.93	8.28	7.53
Conductivity (field) (µS/cm)		408.00	408.00	329.00	442.00	274.00	284.00
Dissolved Oxygen		10.48	12.46	6.81	346.00	9.53	12.00
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds CC						

SWAF1 2019-2020							
Measured / Estimated Flow (L/sec)		**11.48**	**10.84**	**2.67**	**8.30**	**13.64**	**14.46**
Effluent Discharge (L/sec)		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Lab ID		**1492675.00**	**1493688.00**	**1507645.00**	**1508122.00**	**1513029.00**	**1521857.00**
Station Name		**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**
Sample Date		**2020-05-08**	**2020-05-14**	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**
Analyte	**Units**						
1,2-dichloroethane-d4 (%)	%			109.00			
1,4-dichlorobenzene (µg/L)	ug/L			<0.4			
4-bromofluorobenzene (%)	%			90.00			
Ag (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.05	0.07	0.83	0.89	0.26	0.32
Alkalinity as CaCO3 (mg/L)	mg/L	134.00	152.00	114.00	158.00	206.00	201.00
As (mg/L)	mg/L	0.00	0.00	0.00	0.00	0.00	<0.001
B (mg/L)	mg/L	0.080	0.070	0.250	0.260	0.190	0.130
Ba (mg/L)	mg/L	0.02	0.01	0.03	0.06	0.03	0.03
Benzene (µg/L)	ug/L			<0.5			
Ca (mg/L)	mg/L	40.00	40.00	44.00	50.00	52.00	51.00
CBOD5 (mg/L)	mg/L	<1	1.00	8.00	3.00	5.00	6.00
Cd (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001
Cl (mg/L)	mg/L	4.00	3.00	4.00	3.00	4.00	6.00
Co (mg/L)	mg/L	0.0003	0.0002	0.0007	0.0018	0.0004	0.0005
COD (mg/L)	mg/L	64.00	65.00	84.00	241.00	51.00	46.00
Conductivity (µmho/cm)	uS/cm	285.00	297.00	339.00	386.00	408.00	419.00
Cr (mg/L)	mg/L	0.0010	<0.001	0.0030	0.0060	0.0020	0.0020
Cu (mg/L)	mg/L	0.0010	<0.001	0.0030	0.0090	0.0020	0.0020
Dichloromethane (µg/L)	ug/L			<4.0			
DOC (mg/L)	mg/L	26.90	26.80	33.80	30.40	22.00	18.20
Fe (mg/L)	mg/L	0.450	0.370	1.100	2.910	0.770	0.800
Filtration		Y	Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)	mg/L	133.00	129.00	139.00	166.00	171.00	169.00
Hg (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001
K (mg/L)	mg/L	2.00	1.00	4.00	4.00	3.00	4.00
Mg (mg/L)	mg/L	8.00	7.00	7.00	10.00	10.00	10.00
Mn (mg/L)	mg/L	0.06	0.07	0.04	0.24	0.03	0.03
Na (mg/L)	mg/L	17.00	16.00	22.00	26.00	28.00	26.00
N-NH3 (mg/L)	mg/L	<0.010	0.06	0.18	0.16	0.07	<0.010
NH3 (Unionized - calculated) (mg/L)			0.003	0.015	0.023	0.003	N/A
N-NO2 (mg/L)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)	mg/L	0.32	0.16	2.21	0.92	<0.10	<0.10
P - Total (mg/L)	mg/L	0.054	0.041	0.131	0.302	0.101	0.063
Pb (mg/L)	mg/L	<0.001	<0.001	<0.001	0.003	<0.001	<0.001
pH		8.17	8.13	7.72	7.87	7.98	8.10
Phenols (mg/L)	mg/L	<0.001	<0.001	0.0060	0.0050	0.0050	0.0040
Se (mg/L)	mg/L	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001
SO4 (mg/L)	mg/L	13.00	13.00	45.00	43.00	21.00	15.00
TDS (COND - CALC) (mg/L)	mg/L	185.00	193.00	220.00	251.00	265.00	272.00
Toluene (µg/L)	ug/L			<0.5			
Toluene-d8 (%)	%			101.00			
Total Kjeldahl Nitrogen (mg/L)	mg/L	1.54	1.81	2.49	5.95	1.10	1.10
Total P - Soluble (mg/L)	mg/L	0.02	0.02	0.06	0.07	0.06	0.06
Total Suspended Solids (mg/L)	mg/L	12.00	18.00	446.00	283.00	17.00	32.00
Vinyl Chloride (µg/L)	ug/L			<0.2			
Zn (mg/L)	mg/L	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
Field Data							
Temperature (ºC)		3.50	6.60	22.24	19.70	14.40	9.50
pH (field) (pH units)		8.80	8.54	8.30	8.87	5.27	8.94
Conductivity (field) (µS/cm)		390.00	296.00	374.00	374.00	408.00	410.00
Dissolved Oxygen			17.47	5.05	3.33	2.97	6.15
	Meets PWQ						
	Exceeds PW						
	Meets CCM						
	Exceeds CC						

SWAF1 2019-2020			
Measured / Estimated Flow (L/sec)		**17.91**	**10.83**
Effluent Discharge (L/sec)		**NA**	**NA**
Lab ID		**1526418.00**	**1533870.00**
Station Name		**SWAF1**	**SWAF1**
Sample Date		**2020-11-03**	**2020-12-09**
Analyte	**Units**		
1,2-dichloroethane-d4 (%)	%	86.00	
1,4-dichlorobenzene (µg/L)	ug/L	<0.4	
4-bromofluorobenzene (%)	%	109.00	
Ag (mg/L)	mg/L	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.01	<0.01
Alkalinity as CaCO3 (mg/L)	mg/L	208.00	239.00
As (mg/L)	mg/L	<0.001	0.00
B (mg/L)	mg/L	0.150	0.120
Ba (mg/L)	mg/L	0.02	0.02
Benzene (µg/L)	ug/L	<0.5	
Ca (mg/L)	mg/L	50.00	66.00
CBOD5 (mg/L)	mg/L	4.00	3.00
Cd (mg/L)	mg/L	<0.0001	<0.0001
Cl (mg/L)	mg/L	5.00	6.00
Co (mg/L)	mg/L	0.0003	0.0003
COD (mg/L)	mg/L	44.00	49.00
Conductivity (µmho/cm)	uS/cm	448.00	488.00
Cr (mg/L)	mg/L	0.0020	<0.001
Cu (mg/L)	mg/L	0.0020	0.0010
Dichloromethane (µg/L)	ug/L	<4.0	
DOC (mg/L)	mg/L	16.40	17.80
Fe (mg/L)	mg/L	0.630	0.410
Filtration		Y	Y
Hardness as CaCO3 (mg/L)	mg/L	174.00	222.00
Hg (mg/L)	mg/L	<0.0001	<0.0001
K (mg/L)	mg/L	4.00	3.00
Mg (mg/L)	mg/L	12.00	14.00
Mn (mg/L)	mg/L	0.02	0.14
Na (mg/L)	mg/L	32.00	28.00
N-NH3 (mg/L)	mg/L	0.27	1.07
NH3 (Unionized - calculated) (mg/L)		0.005	0.012
N-NO2 (mg/L)	mg/L	<0.10	<0.10
N-NO3 (mg/L)	mg/L	0.55	1.09
P - Total (mg/L)	mg/L	0.041	0.032
Pb (mg/L)	mg/L	<0.001	<0.001
pH		8.13	8.03
Phenols (mg/L)	mg/L	<0.001	<0.001
Se (mg/L)	mg/L	<0.001	<0.001
SO4 (mg/L)	mg/L	27.00	27.00
TDS (COND - CALC) (mg/L)	mg/L	291.00	317.00
Toluene (µg/L)	ug/L	<0.5	
Toluene-d8 (%)	%	91.00	
Total Kjeldahl Nitrogen (mg/L)	mg/L	1.36	2.16
Total P - Soluble (mg/L)	mg/L	0.02	0.01
Total Suspended Solids (mg/L)	mg/L	81.00	23.00
Vinyl Chloride (µg/L)	ug/L	<0.2	
Zn (mg/L)	mg/L	<0.01	<0.01
Field Data			
Temperature (ºC)		0.26	0.30
pH (field) (pH units)		8.40	8.12
Conductivity (field) (µS/cm)		405.00	495.00
Dissolved Oxygen		11.66	6.20
	Meets PWQ		
	Exceeds PW		
	Meets CCM		
	Exceeds CC		

SWMC2 2019-2020							
LAB ID:			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long	1147927	1173931.00
Date Sampled:						2019-05-23	2019-06-06
SWMC3 Measured Flow						253.00	125.00
SWAF Measured Flow						71.00	21.00
SWMC2 Estimated Flow						324.00	146.00
Station name						SWMC2	SWMC2A
Analyte	PWQO	MRL					
1,2-dichloroethane-d4 (%)						90.00	110.00
1,4-dichlorobenzene (µg/L)			4.00			<0.4	<0.4
4-bromofluorobenzene (%)						114.00	127.00
Ag (mg/L)	0.0001	0.0001				<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01				0.01	<0.01
Alkalinity as CaCO3 (mg/L)		5				176.00	183.00
As (mg/L)	0.1	0.001				<0.001	<0.001
B (mg/L)	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.030	0.040
Ba (mg/L)		0.01				0.05	0.05
Benzene (µg/L)			100.00	ND/370	ND/40	<0.5	<0.5
Ca (mg/L)		1				79.00	73.00
CBOD5 (mg/L)		1				2.00	1.00
Cd (mg/L)	0.0002	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001
Cl (mg/L)		1		640/120	600/150	16.00	20.00
Co (mg/L)	0.0009	0.0002			0.110/0.004	0.0003	0.0002
COD (mg/L)		5				35.00	34.00
Conductivity (µmho/cm)		5				426.00	405.00
Cr (mg/L)	0.0089**	0.001	0.0089	ND/.001		0.0020	<0.001
Cu (mg/L)	0.005	0.001		ND/.004	0.029/≤0.002	0.0020	0.0020
Dichloromethane (µg/L)			100.00	ND/9811		<4.0	<4.0
DOC (mg/L)		0.50				14.70	15.70
Fe (mg/L)	0.3	0.03	0.300	ND/0.3	0.001/ND	0.450	0.380
Filtration						Y	Y
Hardness as CaCO3 (mg/L)		1				238.00	223.00
Hg (mg/L)	0.0002	0.0001	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001
K (mg/L)		1				2.00	2.00
Mg (mg/L)		1				10.00	10.00
Mn (mg/L)		0.01				0.06	0.08
Na (mg/L)		2	180.00			11.00	13.00
N-NH3 (mg/L)		0.02				0.050	0.072
NH3 (Unionized - calculated) (m	0.02		0.020				
N-NO2 (mg/L)		0.10			0.6/0.2	<0.10	<0.10
N-NO3 (mg/L)		0.10		124/3.0	32.8/3.0	2.390	1.530
P - Total (mg/L)	0.03*	0.01	0.030			0.033	0.046
Pb (mg/L)	0.025	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001
pH	6.5-8.5					8.25	8.38
Phenols (mg/L)	0.001	0.001	0.0010	ND/0.004	.050/ND	<0.001	<0.001
Se (mg/L)	0.1	0.001				<0.001	<0.001
SO4 (mg/L)		1			429.00	39.00	35.00
TDS (COND - CALC) (mg/L)		5				277.00	263.00
Toluene (µg/L)			0.80	ND/.002	ND/0.0005	<0.5	<0.5
Toluene-d8 (%)						98.00	103.00
Total Kjeldahl Nitrogen (mg/L)		0.10				1.20	1.12
Total P - Soluble (mg/L)						0.01	0.03
Total Suspended Solids (mg/L)		2	600.00			12.00	15.00
Vinyl Chloride (µg/L)							
Zn (mg/L)	0.03	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01
Field Data							
Temperature						14.70	21.00
pH	6.5-8.5					8.41	8.29
Conductivity						383.40	439.00
Dissolved Oxygen (mg/L)						13.16	20.12
	Meets PWQO						
	Exceeds PWQO						
	Meets CCME or MOE BC long term guideline						
	Exceeds CCME or MOE BC long term guideline						

SWMC2 2019-2020						
LAB ID:		**1198012**	**1214686**	**1226558.00**	**1239652**	**1256601.00**
Date Sampled:		**2019-06-19**	**2019-07-12**	**2019-08-08**	**2019-9-4**	**2019-09-23**
SWMC3 Measured Flow		**141.00**	**731.00**	**10.00**	**27.00**	**14.00**
SWAF Measured Flow		**32.00**	**3.90**	**4.30**	**3.70**	**14.00**
SWMC2 Estimated Flow		**173.00**	**734.90**	**14.30**	**30.70**	**28.00**
Station name		**SWMC2A**	**SWMC2A**	**SWMC2A**		**SWMC2A**
Analyte	**PWQO**					
1,2-dichloroethane-d4 (%)						
1,4-dichlorobenzene (µg/L)						
4-bromofluorobenzene (%)						
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01	0.01	<0.01		<0.01
Alkalinity as CaCO3 (mg/L)		196.00	144.00	223.00		179.00
As (mg/L)	0.1	0.00	<0.001	0.00		0.00
B (mg/L)	0.2*	0.040	0.040	0.090		0.110
Ba (mg/L)		0.08	0.08	0.06		0.06
Benzene (µg/L)			67.00			
Ca (mg/L)		89.00		65.00		62.00
CBOD5 (mg/L)		11.00	<1	5.00		1.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001		<0.0001
Cl (mg/L)		20.00	17.00	14.00		14.00
Co (mg/L)	0.0009	0.0015	0.0005	0.0004		0.0005
COD (mg/L)		31.00	22.00	42.00		48.00
Conductivity (µmho/cm)		520.00	442.00	472.00		428.00
Cr (mg/L)	0.0089**	0.0040	0.0010	0.0030		0.0020
Cu (mg/L)	0.005	0.0070	0.0030	0.0030		0.0020
Dichloromethane (µg/L)						
DOC (mg/L)		14.40	12.40	18.90		18.60
Fe (mg/L)	0.3	2.580	0.690	0.720		0.710
Filtration		Y	Y	Y		Y
Hardness as CaCO3 (mg/L)		272.00	200.00	216.00		208.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001		<0.0001
K (mg/L)		3.00	4.00	3.00		4.00
Mg (mg/L)		12.00	8.00	13.00		13.00
Mn (mg/L)		0.13	0.09	0.12		0.10
Na (mg/L)		13.00	9.00	19.00		16.00
N-NH3 (mg/L)		0.170	0.120	0.114		0.190
NH3 (Unionized - calculated) (m	0.02			0.005		0.008
N-NO2 (mg/L)		<0.10	<0.10	<0.10		<0.10
N-NO3 (mg/L)		2.640	8.310	0.270		0.230
P - Total (mg/L)	0.03*	0.200	0.123	0.111		0.086
Pb (mg/L)	0.025	0.00	<0.001	<0.001		<0.001
pH	6.5-8.5	8.11	8.09	8.49		8.06
Phenols (mg/L)	0.001	<0.001	<0.001	<0.001		0.0050
Se (mg/L)	0.1	<0.001	<0.001	<0.001		<0.001
SO4 (mg/L)		38.00	32.00	23.00		29.00
TDS (COND - CALC) (mg/L)		338.00	287.00	307.00		278.00
Toluene (µg/L)						
Toluene-d8 (%)						
Total Kjeldahl Nitrogen (mg/L)		1.09	1.64	1.21		1.30
Total P - Soluble (mg/L)		0.03	0.06	0.07		0.04
Total Suspended Solids (mg/L)		204.00	57.00	21.00		25.00
Vinyl Chloride (µg/L)						
Zn (mg/L)	0.03	<0.01	<0.01	<0.01		0.01
Field Data						
Temperature		19.10	19.20	24.70	19.70	20.20
pH	6.5-8.5	7.67	7.91	7.88	8.19	
Conductivity		546.00	241.00	538.00	422.00	nstrument failure
Dissolved Oxygen (mg/L)		9.54	8.59	7.41	7.42	6.08
	Meets PWQO					
	Exceeds PWQ					
	Meets CCME o					
	Exceeds CCME or					

SWMC2 2019-2020						
LAB ID:		**1459463.00**	**1460893.00**	**1464897.00**	**1471803.00**	**1475061.00**
Date Sampled:		**2019-10-10**	**2019-10-18**	**2019-11-06**	**2019-12-11**	**2020-01-10**
SWMC3 Measured Flow		**21.00**	**184.00**	**513.00**	**373.00**	**104.10**
SWAF Measured Flow		**3.10**	**5.10**	**18.00**	**44.00**	**17.00**
SWMC2 Estimated Flow		**24.10**	**189.10**	**531.00**	**417.00**	**121.10**
Station name		**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**
Analyte	**PWQO**					
1,2-dichloroethane-d4 (%)		98.40				97.00
1,4-dichlorobenzene (µg/L)		<0.4				<0.4
4-bromofluorobenzene (%)		97.00				101.00
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01	0.04	0.04	0.02	0.01
Alkalinity as CaCO3 (mg/L)		200.00	166.00	202.00	198.00	231.00
As (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.070	0.050	0.060	0.040	0.050
Ba (mg/L)		0.05	0.08	0.07	0.06	0.06
Benzene (µg/L)		<0.5				<0.5
Ca (mg/L)		76.00	102.00	109.00	87.00	104.00
CBOD5 (mg/L)		3.00	9.00	2.00	4.00	3.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		19.00	19.00	21.00	21.00	26.00
Co (mg/L)	0.0009	0.0004	0.0005	0.0004	0.0003	0.0003
COD (mg/L)		29.00	36.00	26.00	18.00	29.00
Conductivity (µmho/cm)		505.00	679.00	676.00	551.00	634.00
Cr (mg/L)	0.0089**	0.0020	0.0010	<0.001	<0.001	0.0010
Cu (mg/L)	0.005	0.0020	0.0030	0.0020	0.0020	0.0020
Dichloromethane (µg/L)		<4.0				<4.0
DOC (mg/L)		13.60	12.90	12.20	11.90	10.60
Fe (mg/L)	0.3	0.740	0.600	0.260	0.440	0.490
Filtration		Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		247.00	321.00	334.00	267.00	313.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		4.00	5.00	3.00	3.00	3.00
Mg (mg/L)		14.00	16.00	15.00	12.00	13.00
Mn (mg/L)		0.04	0.07	0.05	0.07	0.07
Na (mg/L)		18.00	13.00	13.00	12.00	14.00
N-NH3 (mg/L)		0.129	0.120	<0.010	0.241	0.111
NH3 (Unionized - calculated) (m	0.02	0.006	0.002	NA	0.005	0.003
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		1.080	11.800	9.240	3.710	2.790
P - Total (mg/L)	0.03*	0.051	0.064	0.034	0.056	0.046
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.55	7.90	8.34	8.03	7.96
Phenols (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		43.00	111.00	83.00	58.00	64.00
TDS (COND - CALC) (mg/L)		328.00	441.00	439.00	358.00	412.00
Toluene (µg/L)		<0.5				<0.5
Toluene-d8 (%)		93.00				110.00
Total Kjeldahl Nitrogen (mg/L)		1.01	1.36	1.29	0.90	1.53
Total P - Soluble (mg/L)		0.02	0.02	0.02	0.03	0.02
Total Suspended Solids (mg/L)		12.00	31.00	13.00	13.00	8.00
Vinyl Chloride (µg/L)						
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data						
Temperature			9.00	6.70	0.24	-0.10
pH	6.5-8.5		8.08	8.06	8.44	8.48
Conductivity			661.00	666.00	538.00	618.00
Dissolved Oxygen (mg/L)			12.01	11.63	meter frozen	10.58
	Meets PWQO					
	Exceeds PWQ					
	Meets CCME o					
	Exceeds CCME or					

SWMC2 2019-2020						
LAB ID:		**1485312.00**	**1487986.00**	**1492674.00**	**1493687.00**	**1507644.00**
Date Sampled:		**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**	**2020-07-30**
SWMC3 Measured Flow		**1211.73**	**630.33**	**70.17**	**49.09**	**33.50**
SWAF Measured Flow		**99.41**	**63.39**	**11.48**	**10.84**	**2.67**
SWMC2 Estimated Flow		**1311.14**	**693.72**	**81.65**	**59.93**	**36.17**
Station name		**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**
Analyte	**PWQO**					
1,2-dichloroethane-d4 (%)			103.00			109.00
1,4-dichlorobenzene (µg/L)			<0.4			<0.4
4-bromofluorobenzene (%)			111.00			90.00
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.02	0.01	0.02	0.03	0.61
Alkalinity as CaCO3 (mg/L)		156.00	174.00	190.00	185.00	120.00
As (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	0.00
B (mg/L)	0.2*	0.020	0.040	0.050	0.050	0.200
Ba (mg/L)		0.04	0.05	0.05	0.04	0.06
Benzene (µg/L)			<0.5			<0.5
Ca (mg/L)		70.00	76.00	79.00	72.00	55.00
CBOD5 (mg/L)		5.00	3.00	<1	<1	5.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		14.00	20.00	16.00	16.00	11.00
Co (mg/L)	0.0009	0.0004	0.0004	0.0002	0.0003	0.0015
COD (mg/L)		39.00	30.00	39.00	38.00	85.00
Conductivity (µmho/cm)		423.00	493.00	484.00	466.00	376.00
Cr (mg/L)	0.0089**	0.0010	<0.001	<0.001	0.0010	0.0050
Cu (mg/L)	0.005	0.0030	0.0020	0.0010	0.0020	0.0060
Dichloromethane (µg/L)			<4.0			<4.0
DOC (mg/L)		11.70	12.70	15.60	16.30	27.00
Fe (mg/L)	0.3	0.600	0.510	0.440	0.490	2.080
Filtration		Y		Y	Y	Y
Hardness as CaCO3 (mg/L)		204.00	227.00	243.00	217.00	174.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		2.00	3.00	2.00	2.00	5.00
Mg (mg/L)		7.00	9.00	11.00	9.00	9.00
Mn (mg/L)		0.07	0.08	0.12	0.12	0.13
Na (mg/L)		12.00	14.00	12.00	12.00	16.00
N-NH3 (mg/L)		0.163	0.561	0.032	0.050	0.180
NH3 (Unionized - calculated) (m	0.02	0.002	0.002	0.003	0.003	0.001
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		3.330	3.520	1.270	0.550	2.350
P - Total (mg/L)	0.03*	0.077	0.051	0.036	0.037	0.228
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	0.00
pH	6.5-8.5	7.99	7.90	8.17	8.22	7.85
Phenols (mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	0.0040
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		35.00	43.00	41.00	38.00	50.00
TDS (COND - CALC) (mg/L)		275.00	320.00	315.00	303.00	244.00
Toluene (µg/L)			<0.5			<0.5
Toluene-d8 (%)			106.00			102.00
Total Kjeldahl Nitrogen (mg/L)		1.49	2.49	1.05	1.22	3.06
Total P - Soluble (mg/L)		0.01	0.01	0.01	0.01	0.04
Total Suspended Solids (mg/L)		28.00	18.00	13.00	15.00	510.00
Vinyl Chloride (µg/L)						
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	0.01
Field Data						
Temperature		1.20	5.10	4.80	6.80	22.44
pH	6.5-8.5	8.09	7.51	8.89	8.57	7.04
Conductivity		414.00	470.00	490.00	497.00	387.00
Dissolved Oxygen (mg/L)		11.65	13.84	12.06	15.85	5.74
	Meets PWQO					
	Exceeds PWQ					
	Meets CCME o					
	Exceeds CCME or					

SWMC2 2019-2020						
LAB ID:		**1508119.00**	**1513028.00**	**1521856.00**	**1526417.00**	**1533869.00**
Date Sampled:		**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**
SWMC3 Measured Flow		**99.21**	**9.89**	**46.00**	**134.88**	**185.29**
SWAF Measured Flow		**8.30**	**13.64**	**14.46**	**17.91**	**10.83**
SWMC2 Estimated Flow		**107.51**	**23.53**	**60.46**	**152.79**	**196.12**
Station name		**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**
Analyte	**PWQO**					
1,2-dichloroethane-d4 (%)					87.00	
1,4-dichlorobenzene (µg/L)					<0.4	
4-bromofluorobenzene (%)					111.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.26	0.13	0.25	<0.01	0.02
Alkalinity as CaCO3 (mg/L)		174.00	185.00	223.00	234.00	230.00
As (mg/L)	0.1	0.00	0.00	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.210	0.140	0.100	0.090	0.060
Ba (mg/L)		0.06	0.05	0.07	0.06	0.06
Benzene (µg/L)					<0.5	
Ca (mg/L)		85.00	64.00	87.00	103.00	108.00
CBOD5 (mg/L)		3.00	4.00	5.00	4.00	2.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		13.00	17.00	19.00	25.00	22.00
Co (mg/L)	0.0009	0.0005	0.0003	0.0004	0.0002	0.0004
COD (mg/L)		55.00	40.00	31.00	24.00	31.00
Conductivity (µmho/cm)		550.00	476.00	595.00	687.00	634.00
Cr (mg/L)	0.0089**	0.0020	0.0010	0.0020	<0.001	<0.001
Cu (mg/L)	0.005	0.0030	0.0020	0.0020	0.0020	0.0020
Dichloromethane (µg/L)					<4.0	
DOC (mg/L)		22.10	15.90	12.30	10.00	10.60
Fe (mg/L)	0.3	0.670	0.570	0.780	0.340	0.350
Filtration		Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		270.00	209.00	275.00	319.00	327.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		4.00	3.00	5.00	3.00	2.00
Mg (mg/L)		14.00	12.00	14.00	15.00	14.00
Mn (mg/L)		0.09	0.06	0.07	0.04	0.08
Na (mg/L)		12.00	22.00	16.00	16.00	13.00
N-NH3 (mg/L)		0.202	0.090	<0.010	0.110	0.173
NH3 (Unionized - calculated) (m	0.02	0.044	0.004	N/A	0.002	0.001
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		3.490	0.200	0.800	5.800	6.360
P - Total (mg/L)	0.03*	0.100	0.084	0.075	0.021	0.025
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.02	8.07	8.13	8.24	8.29
Phenols (mg/L)	0.001	0.0050	0.0050	0.0040	<0.001	<0.001
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		80.00	40.00	62.00	83.00	71.00
TDS (COND - CALC) (mg/L)		358.00	309.00	387.00	447.00	412.00
Toluene (µg/L)					<0.5	
Toluene-d8 (%)					90.00	
Total Kjeldahl Nitrogen (mg/L)		1.91	0.90	0.93	1.00	1.29
Total P - Soluble (mg/L)		0.04	0.04	0.07	0.01	0.01
Total Suspended Solids (mg/L)		46.00	17.00	27.00	8.00	16.00
Vinyl Chloride (µg/L)						
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data						
Temperature		19.40	14.40	9.70	1.70	0.00
pH	6.5-8.5	8.87	8.23	8.87	8.36	7.67
Conductivity		526.00	474.00	570.00	622.00	588.00
Dissolved Oxygen (mg/L)		5.28	7.92	8.23	12.11	13.39
	Meets PWQO					
	Exceeds PWQ					
	Meets CCME o					
	Exceeds CCME or					

SWMC1 2019-2020								
Stream flow (L/sec)			Regulated Effluent Paramete	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long	Environment BC Surface Water Quality Guideline -	456.00	244.00
Effluent Discharge (L/sec)							NA	NA
Sample ID:							1428322.00	1431593.00
Sample Date							2019-05-23	2019-06-06
Station Name							SWMC1	SWMC1
Analyte	PWQO	MRL						
2-dichloroethane-d4 (%)							102.00	104.00
4-dichlorobenzene (µg/L)				4.00			<0.4	<0.4
bromofluorobenzene (%)							95.00	120.00
Ag (mg/L)	0.0001	0.0001					<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01					0.01	<0.01
kalinity as CaCO3 (mg/L)		5					188.00	190.00
As (mg/L)	0.1	0.001					<0.001	<0.001
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.05	0.05
Ba (mg/L)		0.01					0.05	0.05
Benzene (µg/L)				100.00	ND/370	ND/40	<0.5	<0.5
Ca (mg/L)		1					82.00	74.00
CBOD5 (mg/L)		1	10.0				4.00	3.00
Cd (mg/L)	0.0002	0.0001		0.0002	.001/.00009	calculation	<0.0001	<0.0001
Cl (mg/L)		1			640/120	600/150	16.00	20.00
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0003	0.0003
COD (mg/L)		5					29.00	35.00
Conductivity (µmho/cm)		5					445.00	426.00
Cr (mg/L)	0.0089**	0.001		0.0089	ND/.001		0.0020	<0.001
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.0020	0.0020
Dichloromethane (µg/L)				100.00	ND/9811		<4.0	<4.0
DOC (mg/L)		0.50					14.50	15.20
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.43	0.42
Filtration							Y	Y
rdness as CaCO3 (mg/L)		1					250.00	230.00
Hg (mg/L)	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001
K (mg/L)		1					2.00	2.00
Mg (mg/L)		1					11.00	11.00
Mn (mg/L)		0.01					0.06	0.08
Na (mg/L)		2		180.00			12.00	14.00
N-NH3 (mg/L)		0.02	1.0				0.08	0.06
Unionized - calculated	0.02			0.020				
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	<0.10
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	2.41	1.52
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.030	0.047
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001
pH	6.5-8.5						8.21	8.36
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001
Se (mg/L)	0.1	0.001					<0.001	<0.001
SO4 (mg/L)		1				429.00	42.00	36.00
S (COND - CALC) (mg/L)		5					289.00	277.00
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	<0.5	<0.5
Toluene-d8 (%)							95.00	103.00
al Kjeldahl Nitrogen (mg/L)		0.10					1.00	1.07
Total P - Soluble (mg/L)							0.01	0.03
l Suspended Solids (mg/L)		2	10.0	600.00			8.00	58.00
Vinyl Chloride (µg/L)							<0.2	<0.2
Zn (mg/L)	0.03	0.01	0.2	0.030	.037/.007	0.033/0.0075	0.010	<0.01
Field Data								
Temperature							12.30	20.00
pH	6.5-8.5						7.30	8.32
Conductivity							382.30	503.00
Dissolved Oxygen			4.00				11.76	15.19
	Meets PWQO							
	Exceeds PWQO							
	Meets CCME or MOE BC long term guideline							
	Exceeds CCME or MOE BC long term guideline							

SWMC1 2019-2020							
Stream flow (L/sec)		52.00					61.00
Effluent Discharge (L/sec)		NA	NA	NA	NA	NA	NA
Sample ID:			B19-26597-1	B19-27095-4	B19-27537-4	B19-27824-4	
Sample Date		2019-8-8	2019-08-23	2019-08-27	2019-08-30	2019-09-03	2019-9-4
Station Name		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Analyte	PWQO						
2-dichloroethane-d4 (%)							
4-dichlorobenzene (µg/L)			< 0.5	< 0.5	< 0.5	< 0.5	
bromofluorobenzene (%)							
Ag (mg/L)	0.0001						
Al (dissolved) (mg/L)	0.075*						
kalinity as CaCO3 (mg/L)			192.00	202.00	184.00	170.00	
As (mg/L)	0.1						
B (mg/L)	0.2*		0.09	0.11	0.08	0.08	
Ba (mg/L)			0.06	0.07	0.06	0.06	
Benzene (µg/L)			< 0.5	< 0.5	< 0.5	< 0.5	
Ca (mg/L)			64.70	71.30	62.40	62.50	
CBOD5 (mg/L)			< 3	< 3	< 3	< 3	
Cd (mg/L)	0.0002		< 0.000070	< 0.000070	< 0.000070	< 0.000070	
Cl (mg/L)			11.20	13.90	36.50	17.80	
Co (mg/L)	0.0009						
COD (mg/L)			64.00	62.00	63.00	70.00	
Conductivity (µmho/cm)			463.00	465.00	490.00	449.00	
Cr (mg/L)	0.0089**		0.0030	0.0040	0.0040	0.0030	
Cu (mg/L)	0.005		0.0032	0.0036	0.0041	0.0028	
Dichloromethane (µg/L)			< 5	< 5	< 5	< 5	
DOC (mg/L)			18.20	19.80	17.60	16.80	
Fe (mg/L)	0.3		1.75	2.37	1.88	1.58	
Filtration							
rdness as CaCO3 (mg/L)			218.00	242.00	213.00	211.00	
Hg (mg/L)	0.0002		0.00003	< 0.00002	< 0.00002	< 0.00002	
K (mg/L)			3.40	3.90	10.80	3.80	
Mg (mg/L)			13.70	15.40	13.90	13.30	
Mn (mg/L)			0.17	0.17	0.12	0.10	
Na (mg/L)			21.30	24.50	21.70	19.10	
N-NH3 (mg/L)			0.14	0.10	0.13	0.09	
Unionized - calculated	0.02						
N-NO2 (mg/L)			<0.1	< 0.1	< 0.1	< 0.1	
N-NO3 (mg/L)			0.20	0.20	0.30	0.30	
P - Total (mg/L)	0.03*		0.170	0.220	0.170	0.150	
Pb (mg/L)	0.025		0.0005	0.0007	0.0007	0.0006	
pH	6.5-8.5						
Phenols (mg/L)	0.001		<0.002	< 0.002	< 0.002	< 0.002	
Se (mg/L)	0.1						
SO4 (mg/L)			20.00	19.00	33.00	30.00	
S (COND - CALC) (mg/L)			253.00	273.00	292.00	251.00	
Toluene (µg/L)			< 0.5	< 0.5	< 0.5	< 0.5	
Toluene-d8 (%)							
al Kjeldahl Nitrogen (mg/L)			1.10	1.10	0.90	1.00	
Total P - Soluble (mg/L)							
l Suspended Solids (mg/L)			27.00	28.00	32.00	30.00	
Vinyl Chloride (µg/L)			< 0.2	< 0.2	< 0.2	< 0.2	
Zn (mg/L)	0.03		0.005	0.014	0.011	0.006	
Field Data							
Temperature		26.10					20.00
pH	6.5-8.5	7.98					8.35
Conductivity		527.00					439.00
Dissolved Oxygen		6.27					5.84
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWMC1 2019-2020							
Stream flow (L/sec)			26.00	26.00	44.97	491.77	100.94
Effluent Discharge (L/sec)		NA	NA	NA	NA	NA	NA
Sample ID:		B19-28281-4	B19-28725-4	1459464.00	B19-33323-4	B19-33766-4	B19-34301-4
Sample Date		2019-9-6	2019-10-10	2019-10-10	2019-10-15	2019-10-18	2019-10-22
Station Name		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Analyte	PWQO						
2-dichloroethane-d4 (%)				99.20			
4-dichlorobenzene (µg/L)		< 0.5	< 0.5	<0.4	< 0.5	< 0.5	< 0.5
bromofluorobenzene (%)				98.00			
Ag (mg/L)	0.0001			<0.0001			
Al (dissolved) (mg/L)	0.075*			<0.01			
kalinity as CaCO3 (mg/L)		182.00	184.00	203.00	189.00	150.00	187.00
As (mg/L)	0.1			<0.001			
B (mg/L)	0.2*	0.06	0.07	0.07	0.07	0.07	0.06
Ba (mg/L)		0.06	0.07	0.06	0.07	0.09	0.07
Benzene (µg/L)		< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5
Ca (mg/L)		66.00	69.40	78.00	65.60	102.00	81.60
CBOD5 (mg/L)		< 3	< 3	3.00	< 3	4.00	< 3
Cd (mg/L)	0.0002	< 0.000070	< 0.000070	<0.0001	< 0.000070	< 0.000070	< 0.000070
Cl (mg/L)		24.40	22.70	20.00	19.40	24.20	21.20
Co (mg/L)	0.0009			0.0015			
COD (mg/L)		37.00	43.00	33.00	53.00	50.00	31.00
Conductivity (µmho/cm)		492.00	492.00	515.00	513.00	667.00	623.00
Cr (mg/L)	0.0089**	0.0040	0.0050	0.0050	0.0050	0.0030	0.0020
Cu (mg/L)	0.005	0.0039	0.0042	0.0040	0.0029	0.0037	0.0027
Dichloromethane (µg/L)		< 5	< 5	<4.0	< 5	< 5	< 5
DOC (mg/L)		13.50	12.60	13.10	15.90	15.40	13.60
Fe (mg/L)	0.3	1.84	2.19	2.45	2.62	1.35	1.18
Filtration				Y			
rdness as CaCO3 (mg/L)		220.00	229.00	257.00	226.00	324.00	266.00
Hg (mg/L)	0.0002	< 0.00002	< 0.00002	<0.0001	0.00004	0.00009	< 0.00002
K (mg/L)		3.90	7.60	4.00	4.80	8.00	4.50
Mg (mg/L)		13.50	13.50	15.00	15.10	16.70	15.10
Mn (mg/L)		0.11	0.09	0.17	0.12	0.10	0.06
Na (mg/L)		16.80	17.40	20.00	19.20	14.70	15.80
N-NH3 (mg/L)		0.09	0.07	0.12	0.11	0.14	0.18
Unionized - calculated	0.02			0.0056	0.0006	0.0004	0.0013
N-NO2 (mg/L)		< 0.1	< 0.1	<0.10	< 0.1	< 0.1	< 0.1
N-NO3 (mg/L)		0.80	2.70	1.15	0.40	14.40	5.20
P - Total (mg/L)	0.03*	0.140	0.180	0.141	0.100	0.120	0.080
Pb (mg/L)	0.025	0.0007	0.0007	<0.001	0.0008	0.0006	0.0005
pH	6.5-8.5			8.30			
Phenols (mg/L)	0.001	< 0.002	< 0.002	<0.001	< 0.002	< 0.002	< 0.002
Se (mg/L)	0.1			<0.001			
SO4 (mg/L)		38.00	47.00	44.00	38.00	114.00	87.00
S (COND - CALC) (mg/L)		278.00	303.00	335.00	281.00	435.00	361.00
Toluene (µg/L)		< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5
Toluene-d8 (%)				94.00			
al Kjeldahl Nitrogen (mg/L)		0.90	1.00	1.19	0.90	1.70	1.10
Total P - Soluble (mg/L)				0.03			
l Suspended Solids (mg/L)		36.00	40.00	94.00	48.00	32.00	23.00
Vinyl Chloride (µg/L)		< 0.2	< 0.2	<0.2	< 0.2	< 0.2	< 0.2
Zn (mg/L)	0.03	0.009	0.010	0.010			
Field Data							
Temperature					8.10	8.80	10.00
pH	6.5-8.5				7.34	7.19	7.56
Conductivity							
Dissolved Oxygen							
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWMC1 2019-2020							
Stream flow (L/sec)		211.35	622.48	287.03	779.00	210.00	
Effluent Discharge (L/sec)		NA	NA	NA	NA	NA	NA
Sample ID:		B19-34716-4	B19-35135-4	B19-35418-4	1464898.00	1471799.00	1475058.00
Sample Date		2019-10-25	2019-10-29	2019-10-31	2019-11-06	2019-12-11	2020-01-10
Station Name		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Analyte	PWQO						
2-dichloroethane-d4 (%)							98.00
4-dichlorobenzene (µg/L)		< 0.5	< 0.5	< 0.5			<0.4
bromofluorobenzene (%)							98.00
Ag (mg/L)	0.0001				<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*				0.04	0.01	<0.01
kalinity as CaCO3 (mg/L)		190.00	178.00	196.00	216.00	205.00	240.00
As (mg/L)	0.1				<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.06	0.05	0.07	0.06	0.05	0.05
Ba (mg/L)		0.09	0.09	0.08	0.07	0.06	0.07
Benzene (µg/L)		< 0.5	< 0.5	< 0.5			<0.5
Ca (mg/L)		111.00	109.00	106.00	109.00	86.00	109.00
CBOD5 (mg/L)		< 3	< 3	< 3	<1	3.00	3.00
Cd (mg/L)	0.0002	< 0.000070	< 0.000070	< 0.000070	<0.0001	<0.0001	<0.0001
Cl (mg/L)		21.70	24.60	19.80	21.00	20.00	27.00
Co (mg/L)	0.0009				0.0004	0.0005	0.0003
COD (mg/L)		34.00	46.00	39.00	33.00	18.00	31.00
Conductivity (µmho/cm)		671.00	673.00	676.00	683.00	561.00	660.00
Cr (mg/L)	0.0089**	0.0020	0.0020	0.0020	<0.001	0.0010	<0.001
Cu (mg/L)	0.005	0.0030	0.0038	0.0040	0.0020	0.0030	0.0020
Dichloromethane (µg/L)		< 5	< 5	< 5			<4.0
DOC (mg/L)		10.30	11.10	14.20	12.30	11.00	10.70
Fe (mg/L)	0.3	1.00	0.95	0.72	0.36	0.67	0.46
Filtration					Y	Y	Y
rdness as CaCO3 (mg/L)		350.00	340.00	333.00	338.00	268.00	330.00
Hg (mg/L)	0.0002	< 0.00002	0.00	< 0.00002	<0.0001	<0.0001	<0.0001
K (mg/L)		4.60	4.90	4.10	4.00	3.00	3.00
Mg (mg/L)		17.70	16.50	16.50	16.00	13.00	14.00
Mn (mg/L)		0.05	0.05	0.04	0.05	0.07	0.06
Na (mg/L)		15.00	14.50	14.50	14.00	14.00	16.00
N-NH3 (mg/L)		0.16	0.14	0.17	0.04	<0.010	0.15
Unionized - calculated	0.02	0.0004	0.0003	0.0010	0.0007		0.0075
N-NO2 (mg/L)		< 0.1	< 0.1	< 0.1	<0.10	<0.10	<0.10
N-NO3 (mg/L)		6.20	11.20	6.40	8.89	3.25	3.19
P - Total (mg/L)	0.03*	0.050	0.070	0.070	0.039	0.087	0.044
Pb (mg/L)	0.025	0.0004	0.0003	0.0003	<0.001	<0.001	<0.001
pH	6.5-8.5				8.28	8.06	8.05
Phenols (mg/L)	0.001	< 0.002	< 0.001	< 0.002	<0.001	<0.001	<0.001
Se (mg/L)	0.1				<0.001	<0.001	<0.001
SO4 (mg/L)		100.00	94.00	95.00	87.00	57.00	72.00
S (COND - CALC) (mg/L)		412.00	421.00	404.00	444.00	365.00	429.00
Toluene (µg/L)		< 0.5	< 0.5	< 0.5			<0.5
Toluene-d8 (%)							107.00
al Kjeldahl Nitrogen (mg/L)		1.20	1.50	1.30	1.05	1.00	1.32
Total P - Soluble (mg/L)					0.02	0.03	0.02
l Suspended Solids (mg/L)		25.00	15.00	16.00	14.00	30.00	6.00
Vinyl Chloride (µg/L)		< 0.2	< 0.2	< 0.2			<0.2
Zn (mg/L)	0.03				<0.01	<0.01	0.010
Field Data							
Temperature		8.20	9.50	11.90	5.90	0.23	0.10
pH	6.5-8.5	7.17	6.97	7.35	8.10	8.11	8.80
Conductivity					675.00	92.00	118.00
Dissolved Oxygen					11.14	meter frozen	12.50
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWMC1 2019-2020							
Stream flow (L/sec)							
Effluent Discharge (L/sec)		NA	NA	NA	NA	NA	NA
Sample ID:		1480014.00	1485310.00	1487983.00	1492672.00	1493685.00	1507642.00
Sample Date		2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30
Station Name		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Analyte	PWQO						
2-dichloroethane-d4 (%)				108.00			107.00
4-dichlorobenzene (µg/L)				<0.4			<0.4
bromofluorobenzene (%)				105.00			90.00
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	<0.01	0.02	0.01	0.02	0.05	0.50
kalinity as CaCO3 (mg/L)		251.00	163.00	167.00	203.00	187.00	128.00
As (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	0.00
B (mg/L)	0.2*	0.07	0.03	0.04	0.05	0.05	0.18
Ba (mg/L)		0.08	0.04	0.05	0.05	0.04	0.05
Benzene (µg/L)				<0.5			<0.5
Ca (mg/L)		109.00	70.00	76.00	79.00	72.00	58.00
CBOD5 (mg/L)		4.00	5.00	<1	<1	5.00	7.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		35.00	14.00	20.00	17.00	16.00	14.00
Co (mg/L)	0.0009	0.0007	0.0004	0.0008	0.0003	0.0004	0.0010
COD (mg/L)		57.00	36.00	49.00	37.00	32.00	89.00
Conductivity (µmho/cm)		688.00	439.00	491.00	490.00	473.00	425.00
Cr (mg/L)	0.0089**	0.0010	0.0010	0.0020	<0.001	0.0010	0.0030
Cu (mg/L)	0.005	0.0030	0.0030	0.0040	0.0020	0.0020	0.0040
Dichloromethane (µg/L)				<4.0			<4.0
DOC (mg/L)		17.90	11.40	12.70	16.00	17.20	27.50
Fe (mg/L)	0.3	0.84	0.68	1.16	0.48	0.57	1.38
Filtration		Y	Y		Y	Y	Y
rdness as CaCO3 (mg/L)		334.00	208.00	231.00	243.00	221.00	186.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		3.00	2.00	3.00	2.00	2.00	4.00
Mg (mg/L)		15.00	8.00	10.00	11.00	10.00	10.00
Mn (mg/L)		0.16	0.07	0.11	0.10	0.13	0.12
Na (mg/L)		26.00	14.00	14.00	14.00	13.00	18.00
N-NH3 (mg/L)		0.43	0.30	0.31	<0.010	0.03	0.15
Unionized - calculated	0.02	0.0070	0.0031	0.0002	NC	0.0002	0.0012
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		2.35		3.55	1.18	0.67	3.02
P - Total (mg/L)	0.03*	0.122	0.129	0.148	0.042	0.044	0.168
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	8.25	7.99	7.97	8.13	8.19	7.84
Phenols (mg/L)	0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.003
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		68.00	40.00	44.00	44.00	38.00	58.00
S (COND - CALC) (mg/L)		447.00	285.00	319.00	318.00	307.00	276.00
Toluene (µg/L)				<0.5			<0.5
Toluene-d8 (%)				103.00			101.00
al Kjeldahl Nitrogen (mg/L)		2.70	1.35	2.66	1.00	0.90	2.66
Total P - Soluble (mg/L)		0.03	0.05	0.01	0.01	0.01	0.04
l Suspended Solids (mg/L)		65.00	20.00	88.00	22.00	30.00	64.00
Vinyl Chloride (µg/L)				<0.2			<0.2
Zn (mg/L)	0.03	0.020	<0.01	<0.01	<0.01	<0.01	0.020
Field Data							
Temperature		-0.60	1.20	4.90	7.10	7.70	21.30
pH	6.5-8.5	8.33	8.07	6.81	8.49	7.62	7.27
Conductivity		118.00	419.00	485.00	489.00	457.00	412.00
Dissolved Oxygen		6.90	11.22	13.27	9.58	11.56	6.50
	Meets PW						
	Exceeds P						
	Meets CC						
	Exceeds C						

SWMC1 2019-2020						
Stream flow (L/sec)						
Effluent Discharge (L/sec)		NA	NA	NA	NA	NA
Sample ID:		1508117.00	1513026.00	1521854.00	1526415.00	1533868.00
Sample Date		2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09
Station Name		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Analyte	PWQO					
2-dichloroethane-d4 (%)					86.00	
4-dichlorobenzene (µg/L)					<0.4	
bromofluorobenzene (%)					108.00	
Ag (mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.26	0.18	0.41	<0.01	0.02
kalinity as CaCO3 (mg/L)		189.00	192.00	239.00	239.00	233.00
As (mg/L)	0.1	0.00	0.00	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.21	0.15	0.10	0.08	0.09
Ba (mg/L)		0.06	0.05	0.07	0.06	0.06
Benzene (µg/L)					<0.5	
Ca (mg/L)		88.00	64.00	92.00	106.00	109.00
CBOD5 (mg/L)		4.00	5.00	7.00	4.00	3.00
Cd (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		13.00	16.00	20.00	24.00	21.00
Co (mg/L)	0.0009	0.0005	0.0005	0.0005	0.0004	0.0004
COD (mg/L)		62.00	45.00	27.00	26.00	29.00
Conductivity (µmho/cm)		586.00	484.00	634.00	689.00	650.00
Cr (mg/L)	0.0089**	0.0010	0.0020	0.0020	0.0010	<0.001
Cu (mg/L)	0.005	0.0030	0.0020	0.0020	0.0020	0.0020
Dichloromethane (µg/L)					<4.0	
DOC (mg/L)		21.20	16.60	11.10	10.60	11.00
Fe (mg/L)	0.3	0.60	0.79	0.85	0.47	0.39
Filtration		Y	Y	Y	Y	Y
rdness as CaCO3 (mg/L)		286.00	209.00	291.00	331.00	334.00
Hg (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		5.00	3.00	4.00	3.00	3.00
Mg (mg/L)		16.00	12.00	15.00	16.00	15.00
Mn (mg/L)		0.08	0.08	0.11	0.06	0.09
Na (mg/L)		18.00	24.00	19.00	18.00	14.00
N-NH3 (mg/L)		0.16	0.10	0.02	0.11	0.18
Unionized - calculated	0.02	0.0266	0.0017	0.0024	0.0004	0.0231
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		3.39	0.18	0.86	5.41	6.63
P - Total (mg/L)	0.03*	0.114	0.115	0.084	0.037	0.032
Pb (mg/L)	0.025	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5	7.95	8.06	8.14	8.19	8.25
Phenols (mg/L)	0.001	0.005	0.004	0.004	<0.001	0.002
Se (mg/L)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		88.00	39.00	70.00	83.00	73.00
S (COND - CALC) (mg/L)		381.00	315.00	412.00	448.00	422.00
Toluene (µg/L)					<0.5	
Toluene-d8 (%)					91.00	
al Kjeldahl Nitrogen (mg/L)		2.04	0.80	0.96	1.04	1.36
Total P - Soluble (mg/L)		0.04	0.05	0.09	0.01	0.01
l Suspended Solids (mg/L)		78.00	39.00	51.00	28.00	34.00
Vinyl Chloride (µg/L)					<0.2	
Zn (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data						
Temperature		19.50	13.90	9.50	1.30	0.00
pH	6.5-8.5	8.72	7.84	8.79	7.58	9.25
Conductivity		552.00	480.00	623.00	623.00	617.00
Dissolved Oxygen		4.40	6.51	8.05	1095.00	13.05
	Meets PW					
	Exceeds P					
	Meets CC					
	Exceeds C					

SWMC5 2019-2020	Note: sampling commenced at this location on 2020-05-08						
Lab ID						1492670.00	1493683.00
Station Name						SWMC5	SWMC5
Sample Date						2020-05-08	2020-05-14
Analyte	**Units**	**MRL**	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline -Short/Long Term (mg/L)		
1,2-dichloroethane-d4 (%)							
1,4-dichlorobenzene (µg/L)			4.00				
4-bromofluorobenzene (%)							
Ag (mg/L)	mg/L	0.00				<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.01				0.12	0.17
Alkalinity as CaCO3 (mg/L)	mg/L	5.00				228.00	250.00
As (mg/L)	mg/L	0.00				<0.001	<0.001
B (mg/L)	mg/L	0.01	0.2*	29/1.5	ND/1.2	0.92	0.96
Ba (mg/L)	mg/L	0.01				0.08	0.07
Benzene (µg/L)			100.00	ND/370	ND/40		
Ca (mg/L)	mg/L	1.00				75.00	70.00
CBOD5 (mg/L)	mg/L	1.00				1.00	3.00
Cd (mg/L)	mg/L	0.00	0.00020	.001/.00009	calculation	<0.0001	<0.0001
Cl (mg/L)	mg/L	1.00		640/120	600/150	137.00	134.00
Co (mg/L)	mg/L	0.0002			0.110/0.004	0.0013	0.0014
COD (mg/L)	mg/L	5.00				69.00	66.00
Conductivity (µmho/cm)	uS/cm	5.00				1430.00	1460.00
Cr (mg/L)	mg/L	0.0010	0.0089	ND/.001		0.0030	0.0030
Cu (mg/L)	mg/L	0.0010		ND/.004	0.029/≤0.002	0.0020	0.0030
Dichloromethane (µg/L)			100.00	ND/9811			
DOC (mg/L)	mg/L	0.50				26.70	26.20
Fe (mg/L)	mg/L	0.03	0.30	ND/0.3	0.001/ND	0.36	0.31
Filtration						Y	Y
Hardness as CaCO3 (mg/L)	mg/L	1.00				303.00	274.00
Hg (mg/L)	mg/L	0.00	0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001
K (mg/L)	mg/L	1.00				47.00	42.00
Mg (mg/L)	mg/L	1.00				28.00	24.00
Mn (mg/L)	mg/L	0.01				0.06	0.06
Na (mg/L)	mg/L	2.00	180.00			160.00	153.00
N-NH3 (mg/L)	mg/L	0.01				<0.010	0.03
-NH3 (Unionized - calculated) (mg/L)			0.02000			NC	0.00003
N-NO2 (mg/L)	mg/L	0.10			0.6/0.2	<0.10	<0.10
N-NO3 (mg/L)	mg/L	0.10		124/3.0	32.8/3.0	45.10	46.10
P - Total (mg/L)	mg/L	0.002	0.030			0.069	0.052
Pb (mg/L)	mg/L	0.0010	0.0250	ND/.007	0.003/ND	<0.001	<0.001
pH		1.00				8.33	8.32
Phenols (mg/L)	mg/L	0.0010	0.0010	ND/0.004	.050/ND	<0.001	<0.004
Se (mg/L)	mg/L	0.00				<0.001	<0.001
SO4 (mg/L)	mg/L	1.00			429.00	98.00	102.00
TDS (COND - CALC) (mg/L)	mg/L	1.00				930.00	949.00
Toluene (µg/L)		0.10	0.80	ND/.002	ND/0.0005		
Toluene-d8 (%)		0.00					
Total Kjeldahl Nitrogen (mg/L)		2.00				3.08	3.63
Total P - Soluble (mg/L)		0.01				0.03	0.03
Total Suspended Solids (mg/L)						20.00	42.00
Vinyl Chloride (µg/L)			600.00				
Zn (mg/L)			0.03	.037/.007	0.033/0.0075	<0.01	<0.01
Field Data							
Temperature						9.10	8.80
pH						8.52	6.78
Conductivity						1462.00	1388.00
Dissolved Oxygen (mg/L)			>4			9.78	15.33
	Meets PWQO						
	Exceeds PWQO						
	Meets CCME or MOE BC long term guideline						
	Exceeds CCME or MOE BC long term guideline						

SWMC5 2019-2020	Note: s					
Lab ID		1507640.00	1508115.00	1513024.00	1521852.00	1526413.00
Station Name		SWMC5	SWMC5	SWMC5	SWMC5	SWMC5
Sample Date		2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03
Analyte	**Units**					
1,2-dichloroethane-d4 (%)		106.00				89.00
1,4-dichlorobenzene (µg/L)		<0.4				<0.4
4-bromofluorobenzene (%)		90.00				102.30
Ag (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	0.45	0.24	0.11	0.34	0.02
Alkalinity as CaCO3 (mg/L)	mg/L	184.00	217.00	244.00	293.00	265.00
As (mg/L)	mg/L	0.00	0.00	0.00	<0.001	<0.001
B (mg/L)	mg/L	0.56	0.54	0.67	0.76	0.73
Ba (mg/L)	mg/L	0.08	0.08	0.09	0.08	0.08
Benzene (µg/L)		<0.5				<0.5
Ca (mg/L)	mg/L	71.00	87.00	82.00	94.00	105.00
CBOD5 (mg/L)	mg/L	6.00	2.00	5.00	7.00	5.00
Cd (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	94.00	93.00	104.00	126.00	111.00
Co (mg/L)	mg/L	0.0018	0.0014	0.0011	0.0013	0.0012
COD (mg/L)	mg/L	70.00	72.00	76.00	44.00	44.00
Conductivity (µmho/cm)	uS/cm	1050.00	1110.00	1230.00	1370.00	1380.00
Cr (mg/L)	mg/L	0.0040	0.0030	0.0030	0.0030	0.0020
Cu (mg/L)	mg/L	0.0060	0.0070	0.0030	0.0030	0.0020
Dichloromethane (µg/L)		<4.0				<4.0
DOC (mg/L)	mg/L	25.50	25.50	21.40	17.10	18.00
Fe (mg/L)	mg/L	1.41	0.97	0.79	0.56	0.47
Filtration		Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)	mg/L	256.00	308.00	299.00	342.00	369.00
Hg (mg/L)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	29.00	28.00	32.00	33.00	35.00
Mg (mg/L)	mg/L	19.00	22.00	23.00	26.00	26.00
Mn (mg/L)	mg/L	0.10	0.11	0.05	0.04	0.04
Na (mg/L)	mg/L	99.00	110.00	126.00	129.00	127.00
N-NH3 (mg/L)	mg/L	1.50	0.12	0.13	0.01	0.12
-NH3 (Unionized - calculated) (mg/L)		0.00103	0.02480	0.00004	0.00065	0.00012
N-NO2 (mg/L)	mg/L	0.13	<0.10	0.14	<0.10	<0.50
N-NO3 (mg/L)	mg/L	24.40	25.80	27.80	36.90	44.00
P - Total (mg/L)	mg/L	0.351	0.238	0.252	0.096	0.088
Pb (mg/L)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001
pH		7.92	7.99	8.07	8.23	8.20
Phenols (mg/L)	mg/L	0.0080	0.0070	0.0050	<0.004	<0.001
Se (mg/L)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	102.00	117.00	117.00	109.00	109.00
TDS (COND - CALC) (mg/L)	mg/L	682.00	722.00	800.00	890.00	897.00
Toluene (µg/L)		<0.5				<0.5
Toluene-d8 (%)		103.00				103.00
Total Kjeldahl Nitrogen (mg/L)		5.57	3.46	2.80	2.60	2.17
Total P - Soluble (mg/L)		0.15	0.08	0.16	0.10	0.05
Total Suspended Solids (mg/L)		91.00	96.00	46.00	39.00	22.00
Vinyl Chloride (µg/L)		<0.2				<0.2
Zn (mg/L)		0.01	<0.01	<0.01	<0.01	<0.01
Field Data						
Temperature		20.49	20.10	16.00	9.90	1.48
pH		6.23	8.82	5.97	8.46	7.02
Conductivity		990.00	1236.00	1170.00	1304.00	1232.00
Dissolved Oxygen (mg/L)		6.64	4.41	7.98	8.62	12.48
	Meets PWQC					
	Exceeds PWC					
	Meets CCME					
	Exceeds CCM					

SWMC5 2019-2020	Note: s	
Lab ID		**1533865.00**
Station Name		**SWMC5**
Sample Date		**2020-12-09**
Analyte	**Units**	
1,2-dichloroethane-d4 (%)		
1,4-dichlorobenzene (µg/L)		
4-bromofluorobenzene (%)		
Ag (mg/L)	mg/L	<0.0001
Al (dissolved) (mg/L)	mg/L	0.04
Alkalinity as CaCO3 (mg/L)	mg/L	256.00
As (mg/L)	mg/L	<0.001
B (mg/L)	mg/L	0.57
Ba (mg/L)	mg/L	0.08
Benzene (µg/L)		
Ca (mg/L)	mg/L	115.00
CBOD5 (mg/L)	mg/L	5.00
Cd (mg/L)	mg/L	<0.0001
Cl (mg/L)	mg/L	124.00
Co (mg/L)	mg/L	0.0011
COD (mg/L)	mg/L	50.00
Conductivity (µmho/cm)	uS/cm	1320.00
Cr (mg/L)	mg/L	0.0030
Cu (mg/L)	mg/L	0.0030
Dichloromethane (µg/L)		
DOC (mg/L)	mg/L	18.00
Fe (mg/L)	mg/L	0.42
Filtration		Y
Hardness as CaCO3 (mg/L)	mg/L	398.00
Hg (mg/L)	mg/L	<0.0001
K (mg/L)	mg/L	32.00
Mg (mg/L)	mg/L	27.00
Mn (mg/L)	mg/L	0.06
Na (mg/L)	mg/L	104.00
N-NH3 (mg/L)	mg/L	0.14
-NH3 (Unionized - calculated) (mg/L)		0.00001
N-NO2 (mg/L)	mg/L	<0.10
N-NO3 (mg/L)	mg/L	45.50
P - Total (mg/L)	mg/L	0.075
Pb (mg/L)	mg/L	0.0020
pH		8.30
Phenols (mg/L)	mg/L	0.0030
Se (mg/L)	mg/L	<0.001
SO4 (mg/L)	mg/L	110.00
TDS (COND - CALC) (mg/L)	mg/L	858.00
Toluene (µg/L)		
Toluene-d8 (%)		
Total Kjeldahl Nitrogen (mg/L)		2.91
Total P - Soluble (mg/L)		0.05
Total Suspended Solids (mg/L)		35.00
Vinyl Chloride (µg/L)		
Zn (mg/L)		0.01
Field Data		
Temperature		0.60
pH		6.03
Conductivity		1251.00
Dissolved Oxygen (mg/L)		13.49
	Meets PWQC	
	Exceeds PWC	
	Meets CCME	
	Exceeds CCM	

Appendix G

Quality Assurance / Quality Control Data for Study Area for 2019-05-23 to 2020-12-09

Field Duplicate Results - 2019 - 2020						
Lab ID			**1428329.00**	**1428334.00**		**1431585.00**
Sample Location			**SW4**	**DUP-1**	**RPD**	**SWFD3**
Sample Date			**2019-05-23**	**2019-05-23**		**2019-06-06**
Analyte	**Units**	**MRL**				
1,2-dichloroethane-d4	%	0.00	94.00	95.00	0.71	100.00
1,4-dichlorobenzene	ug/L	0.40	<0.4	<0.4	N/A	<0.4
4-bromofluorobenzene	%	0.00	91.00	103.00	8.42	115.00
Ag	mg/L	0.00	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	mg/L	0.01	0.02	0.02	0.00	<0.01
Alkalinity as CaCO3	mg/L	5.00	145.00	145.00	0.00	171.00
As	mg/L	0.00	<0.001	<0.001	N/A	<0.001
B	mg/L	0.01	0.02	0.01	40.00	0.02
Ba	mg/L	0.01	0.04	0.04	0.00	0.05
Benzene	ug/L	0.50	<0.5	<0.5	N/A	<0.5
Ca	mg/L	1.00	70.00	70.00	0.00	74.00
CBOD5	mg/L	1.00	5.00	3.00	30.77	5.00
Cd	mg/L	0.00	<0.0001	<0.0001	N/A	<0.0001
Cl	mg/L	1.00	20.00	20.00	0.00	24.00
Co	mg/L	0.00	<0.0002	<0.0002	N/A	<0.0002
COD	mg/L	5.00	38.00	38.00	0.00	42.00
Conductivity	uS/cm	5.00	370.00	380.00	1.79	420.00
Cr	mg/L	0.00	0.00	0.00	0.00	<0.001
Cu	mg/L	0.00	0.00	0.00	0.00	0.00
Dichloromethane	ug/L	4.00	<4.0	<4.0	N/A	<4.0
DOC	mg/L	0.50	14.80	13.90	4.14	16.70
Fe	mg/L	0.03	0.31	0.28	6.67	0.28
Filtration			Y	Y	N/A	Y
Hardness as CaCO3	mg/L	1.00	204.00	208.00	1.30	222.00
Hg	mg/L	0.00	<0.0001	<0.0001	N/A	<0.0001
K	mg/L	1.00	1.00	1.00	0.00	1.00
Mg	mg/L	1.00	7.00	8.00	9.09	9.00
Mn	mg/L	0.01	0.06	0.05	11.76	0.11
Na	mg/L	2.00	10.00	10.00	0.00	12.00
N-NH3	mg/L	0.01	0.02	0.02	0.00	0.04
-NH3 (un-ionized ammonia)						
N-NO2	mg/L	0.10	<0.10	<0.10	N/A	<0.10
N-NO3	mg/L	0.10	2.49	2.49	0.00	1.99
P	mg/L	0.00	0.09	0.07	18.40	0.08
Pb	mg/L	0.00	<0.001	<0.001	N/A	<0.001
pH		1.00	8.14	8.16	0.16	8.19
Phenols	mg/L	0.00	<0.001	<0.001	N/A	<0.001
Se	mg/L	0.00	<0.001	<0.001	N/A	<0.001
SO4	mg/L	1.00	31.00	31.00	0.00	33.00
TDS (COND - CALC)	mg/L	1.00	240.00	247.00	1.93	273.00
Toluene	ug/L	0.50	<0.5	<0.5	N/A	<0.5
Toluene-d8	%	0.00	96.00	95.00	0.70	102.00
Total Kjeldahl Nitrogen	mg/L	0.15	1.30	1.10	10.81	1.09
Total P - Soluble	mg/L	0.00	0.04	0.04	11.76	0.08
Total Suspended Solids	mg/L	2.00	7.00	9.00	17.39	10.00
Vinyl Chloride	ug/L	0.20	<0.2	<0.2	N/A	<0.2
Zn	mg/L	0.01	<0.01	<0.01	N/A	<0.01
RPD - Relative Percent Difference						
RPD = abs (X1 - X2)/((X1 + X2)/2) * 100						
X1 = Sample Parameter Value						
X2 = Duplicate Parameter Value						
BOLD or Red = SLR RPD Criteria Exceeded						

Field Duplicate Results - 2019 - 2020

Field Duplicate Results -						
Lab ID	**1431595.00**		**1434217.00**	**1434220.00**		**1440939.00**
Sample Location	**DUP-1**		**SWMC2A**	**DUP-1**		**SWMC4**
Sample Date	**2019-06-06**		**2019-06-19**	**2019-06-19**		**2019-07-12**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4	100.00	0.00				
1,4-dichlorobenzene	<0.4	N/A				
4-bromofluorobenzene	123.00	6.72				
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	<0.01	N/A	<0.01	<0.01	N/A	0.02
Alkalinity as CaCO3	171.00	0.00	196.00	194.00	1.03	151.00
As	<0.001	N/A	0.00	0.00	0.00	<0.001
B	0.02	0.00	0.04	0.04	0.00	0.03
Ba	0.05	0.00	0.08	0.09	11.76	0.09
Benzene	<0.5	N/A				
Ca	73.00	1.36	89.00	88.00	1.13	73.00
CBOD5	2.00	**85.71**	11.00	3.00	**114.29**	<1
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	24.00	0.00	20.00	20.00	0.00	18.00
Co	<0.0002	N/A	0.00	0.00	42.11	0.00
COD	40.00	4.88	31.00	47.00	41.03	31.00
Conductivity	420.00	0.00	520.00	516.00	0.77	496.00
Cr	<0.001	N/A	0.00	0.01	**40.00**	<0.001
Cu	0.00	0.00	0.01	0.01	**35.29**	0.00
Dichloromethane	<4.0	N/A				
DOC	16.40	1.81	14.40	14.90	3.41	11.60
Fe	0.29	3.51	2.58	3.62	**33.55**	0.43
Filtration	Y		Y	Y		Y
Hardness as CaCO3	219.00	1.36	272.00	269.00	1.11	215.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	1.00	0.00	3.00	3.00	0.00	4.00
Mg	9.00	0.00	12.00	12.00	0.00	8.00
Mn	0.11	0.00	0.13	0.16	20.69	0.06
Na	13.00	8.00	13.00	12.00	8.00	8.00
N-NH3	0.04	14.63	0.17	0.18	5.71	0.09
-NH3 (un-ionized ammoni						
N-NO2	<0.10	N/A	<0.10	<0.10	N/A	<0.10
N-NO3	2.01	1.00	2.64	2.60	1.53	9.60
P	0.08	7.41	0.20	0.30	**38.38**	0.12
Pb	<0.001	N/A	0.00	0.00	0.00	<0.001
pH	8.26	0.85	8.11	8.07	0.49	8.09
Phenols	<0.001	N/A	<0.001	<0.001	N/A	<0.001
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	33.00	0.00	38.00	38.00	0.00	36.00
TDS (COND - CALC)	273.00	0.00	338.00	335.00	0.89	322.00
Toluene	<0.5	N/A				1.73
Toluene-d8	107.00	4.78				
Total Kjeldahl Nitrogen	1.49	31.01	1.09	1.14	4.48	
Total P - Soluble	0.07	8.20	0.03	0.04	11.76	0.06
Total Suspended Solids	9.00	10.53	204.00	299.00	37.77	28.00
Vinyl Chloride	<0.2	N/A				
Zn	<0.01	N/A	<0.01	0.01	N/A	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPD						

Field Duplicate Results -						
Lab ID	**1440946.00**		**1455467.00**	**1455468.00**		**1459463.00**
Sample Location	**DUP-1**		**SWMC2A**	**DUP**		**SWMC2A**
Sample Date	**2019-07-12**		**2019-09-23**	**2019-09-23**		**2019-10-10**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4						98.40
1,4-dichlorobenzene						<0.4
4-bromofluorobenzene						97.00
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.02	0.00	<0.01	<0.01	N/A	<0.01
Alkalinity as CaCO3	164.00	8.25	179.00	179.00	0.00	200.00
As	<0.001	N/A	0.00	<0.001	N/A	<0.001
B	0.03	0.00	0.11	0.11	0.00	0.07
Ba	0.08	11.76	0.06	0.06	0.00	<0.5
Benzene						
Ca	74.00	1.36	62.00	62.00	0.00	76.00
CBOD5	<1	N/A	1.00	4.00	**120.00**	3.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	18.00	0.00	14.00	14.00	0.00	19.00
Co	0.00	0.00	0.00	0.00	0.00	0.00
COD	18.00	**53.06**	48.00	44.00	8.70	29.00
Conductivity	474.00	4.54	428.00	432.00	0.93	505.00
Cr	<0.001	N/A	0.00	0.00	**66.67**	0.00
Cu	0.00	0.00	0.00	0.00	0.00	0.00
Dichloromethane						<4.0
DOC	12.20	5.04	18.60	18.30	1.63	13.60
Fe	0.43	0.00	0.71	0.72	1.40	0.74
Filtration	Y		Y	Y		Y
Hardness as CaCO3	218.00	1.39	208.00	208.00	0.00	247.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	4.00	0.00	4.00	4.00	0.00	4.00
Mg	8.00	0.00	13.00	13.00	0.00	14.00
Mn	0.05	18.18	0.10	0.10	0.00	0.04
Na	8.00	0.00	16.00	15.00	6.45	18.00
N-NH3	0.08	11.76	0.19	0.19	0.00	0.13
-NH3 (un-ionized ammoni			0.01	0.01		
N-NO2	<0.10	N/A	<0.10	<0.10	N/A	<0.10
N-NO3	9.56	0.42	0.23	0.24	4.26	1.08
P	0.10	19.05	0.09	0.09	6.74	0.05
Pb	<0.001	N/A	<0.001	<0.001	N/A	<0.001
pH	8.10	0.12	8.06	8.05	0.12	8.55
Phenols	<0.001	N/A	0.01	0.00	22.22	<0.001
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	37.00	2.74	29.00	29.00	0.00	43.00
TDS (COND - CALC)	308.00	4.44	278.00	281.00	1.07	328.00
Toluene	1.28	29.90				<0.5
Toluene-d8						93.00
Total Kjeldahl Nitrogen			1.30	1.00	26.09	1.01
Total P - Soluble	0.06	0.00	0.04	0.04	5.41	0.02
Total Suspended Solids	20.00	33.33	25.00	24.00	4.08	12.00
Vinyl Chloride						<0.2
Zn	<0.01	N/A	0.01	<0.01	N/A	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1459466.00**		**1460887.00**	**1460894.00**		**1464898.00**
Sample Location	**DUP-1**		**SWMC4**	**DUP**		**SWMC1**
Sample Date	**2019-10-10**		**2019-10-18**	**2019-10-18**		**2019-11-06**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4	101.00	2.61				
1,4-dichlorobenzene	<0.4	NA				
4-bromofluorobenzene	98.00	1.03				
Ag	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Al (dissolved)	<0.01	NA	0.08	0.09		0.04
Alkalinity as CaCO3	209.00	4.40	176.00	173.00	1.72	216.00
As	<0.001	NA	<0.001	<0.001	NA	<0.001
B	0.07	0.00	0.03	0.03	0.00	0.06
Ba	<0.5		0.05	0.09	**57.14**	0.07
Benzene						
Ca	77.00	1.31	121.00	120.00	0.83	109.00
CBOD5	5.00	**50.00**	5.00	9.00	**57.14**	<1
Cd	<0.0001		<0.0001	<0.0001	NA	<0.0001
Cl	20.00	5.13	22.00	22.00	0.00	21.00
Co	0.00		0.00	0.00	0.00	0.00
COD	30.00	3.39	40.00	31.00	25.35	30.50
Conductivity	505.00	0.00	736.00	739.00	0.41	683.00
Cr	0.00	0.00	<0.001	<0.001	NA	<0.001
Cu	0.00	0.00	0.00	0.00	0.00	0.00
Dichloromethane	<4.0	NA				
DOC	13.40	1.48	11.10	11.20	0.90	12.30
Fe	0.76	2.67	0.25	0.26	3.92	0.36
Filtration	Y	2.67	Y	Y		Y
Hardness as CaCO3	250.00	1.21	368.00	366.00	0.54	338.00
Hg	<0.0001	0.00	<0.0001	<0.0001	NA	<0.0001
K	4.00	0.00	6.00	5.00	18.18	4.00
Mg	14.00		16.00	16.00	0.00	16.00
Mn	0.04	0.00	0.07	0.07	0.00	0.05
Na	18.00	1.56	8.00	7.00	13.33	14.00
N-NH3	0.13	NA	0.07	0.06	25.40	0.04
-NH3 (un-ionized ammoni						
N-NO2	<0.10		<0.10	<0.10	NA	<0.10
N-NO3	1.11	#REF!	13.00	13.00	0.00	8.89
P	0.06	7.55	0.05	0.05	2.11	0.04
Pb	<0.001	NA	<0.001	<0.001	NA	<0.001
pH	8.55	0.00	7.70	7.68	0.26	8.28
Phenols	<0.001	NA	<0.001	<0.001	NA	<0.001
Se	<0.001	NA	<0.001	<0.001	NA	<0.001
SO4	42.00	2.35	131.00	132.00	0.76	87.00
TDS (COND - CALC)	328.00	0.00	478.00	480.00	0.42	444.00
Toluene	<0.5					
Toluene-d8	91.00	2.17				
Total Kjeldahl Nitrogen	1.09	7.62	1.51	1.36	10.45	1.05
Total P - Soluble	0.02	4.65	0.02	0.02	12.50	0.02
Total Suspended Solids	12.00	0.00	9.00	7.00	25.00	14.00
Vinyl Chloride	<0.2	NA				
Zn	<0.01	NA	0.01	0.01	0.00	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1464900.00**		**1471806.00**	**1471811.00**		**1475057.00**
Sample Location	**DUP-1**		**SWMC3**	**DUP-1**		**SW1**
Sample Date	**2019-11-06**		**2019-12-11**	**2019-12-11**		**2020-01-10**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4						99.00
1,4-dichlorobenzene						<0.4
4-bromofluorobenzene						98.00
Ag	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Al (dissolved)	0.03	28.57	0.05	0.05	0.00	0.06
Alkalinity as CaCO3	206.00	4.74	222.00	216.00	2.74	246.00
As	<0.001	NA	<0.001	<0.001	NA	<0.001
B	0.05	18.18	0.04	0.02	**66.67**	1.70
Ba	0.07	0.00	0.07	0.07	0.00	0.13
Benzene						<0.5
Ca	109.00	0.00	102.00	102.00	0.00	107.00
CBOD5	<1	NA	4.00	3.00	28.57	2.00
Cd	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Cl	22.00	4.65	26.00	26.00	0.00	194.00
Co	0.00	0.00	0.00	0.00	0.00	0.00
COD	30.50	**31.58**	13.00	13.00	0.00	76.00
Conductivity	685.00	0.29	631.00	628.00	0.48	1920.00
Cr	<0.001	NA	<0.001	<0.001	NA	0.01
Cu	0.00	0.00	0.00	0.00	0.00	0.00
Dichloromethane						<4.0
DOC	12.00	2.47	8.00	8.10	1.24	26.40
Fe	0.35	2.82	0.22	0.21	4.65	0.54
Filtration	Y	NA	Y	Y	NA	Y
Hardness as CaCO3	334.00	1.19	308.00	308.00	0.00	415.00
Hg	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
K	3.00	28.57	3.00	2.00	40.00	62.00
Mg	15.00	6.45	13.00	13.00	0.00	36.00
Mn	0.05	0.00	0.04	0.04	0.00	0.06
Na	14.00	0.00	12.00	11.00	8.70	190.00
N-NH3	<0.010	NA	0.02	0.01	22.22	0.41
-NH3 (un-ionized ammoni						
N-NO2	<0.10	NA	<0.10	<0.10	NA	<0.10
N-NO3	8.60	3.32	4.75	4.70	1.06	76.80
P	0.04	8.00	0.03	0.03	0.00	0.11
Pb	<0.001	NA	<0.001	<0.001	NA	<0.001
pH	8.39	1.32	8.16	8.14	0.25	7.96
Phenols	<0.001	NA	<0.001	<0.001	NA	0.01
Se	<0.001	NA	<0.001	<0.001	NA	<0.001
SO4	87.00	0.00	75.00	75.00	0.00	111.00
TDS (COND - CALC)	445.00	0.22	410.00	408.00	0.49	1250.00
Toluene						<0.5
Toluene-d8						105.00
Total Kjeldahl Nitrogen	1.17	10.81	0.70	0.70	0.00	3.50
Total P - Soluble	0.02	5.41	0.02	0.02	5.71	0.04
Total Suspended Solids	15.00	6.90	5.00	5.00	0.00	21.00
Vinyl Chloride						<0.2
Zn	<0.01	NA	<0.01	<0.01	NA	0.02
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPD						

Field Duplicate Results -						
Lab ID	**1475066.00**		**1480013.00**	**1480021.00**		**1485309.00**
Sample Location	**DUP-1**		**SW1**	**DUP-1**		**SW1**
Sample Date	**2020-01-10**		**2020-02-14**	**2020-02-14**		**2020-03-17**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4	106.00	6.83				
1,4-dichlorobenzene	<0.4	N/A				
4-bromofluorobenzene	85.00	14.21				
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.17	95.65	0.01	0.10	163.64	0.02
Alkalinity as CaCO3	247.00	0.41	193.00	185.00	4.23	174.00
As	<0.001	N/A	<0.001	<0.001	N/A	<0.001
B	1.50	12.50	1.82	1.87	2.71	0.10
Ba	0.13	0.00	0.14	0.14	0.00	0.04
Benzene	<0.5	N/A				
Ca	107.00	0.00	78.00	78.00	0.00	70.00
CBOD5	3.00	40.00	5.00	6.00	18.18	7.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	200.00	3.05	212.00	192.00		24.00
Co	0.00	0.00	0.00	0.00	6.45	0.00
COD	76.00	0.00	72.00	72.00	0.00	43.00
Conductivity	1930.00	0.52	1980.00	1990.00	0.50	508.00
Cr	0.01	33.33	0.01	0.01	0.00	0.00
Cu	0.00	0.00	0.00	0.00	0.00	0.00
Dichloromethane	<4.0	N/A				
DOC	27.10	2.62	29.20	30.50	4.36	12.70
Fe	0.52	3.77	0.36	0.40	10.53	0.61
Filtration	Y	N/A	Y	Y	N/A	Y
Hardness as CaCO3	415.00	0.00	347.00	347.00	0.00	212.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	63.00	1.60	74.00	74.00	0.00	4.00
Mg	36.00	0.00	37.00	37.00	0.00	9.00
Mn	0.06	0.00	0.06	0.07	15.38	0.07
Na	191.00	0.52	233.00	227.00	2.61	
N-NH3	0.39	3.52	0.25	0.26	7.47	23.00
-NH3 (un-ionized ammoni						0.51
N-NO2	<0.10	N/A	<0.10	<0.10	N/A	<0.10
N-NO3	77.10	0.39	93.40	93.50	0.11	5.30
P	0.10	6.57	0.08	0.09	8.19	0.21
Pb	<0.001	N/A	<0.001	<0.001	N/A	<0.001
pH	7.94	0.25	8.10	8.25	1.83	7.95
Phenols	0.00	22.22	0.00	<0.001	N/A	0.00
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	115.00	3.54	93.00	94.00	1.07	43.00
TDS (COND - CALC)	1250.00	0.00	1290.00	1290.00	0.00	330.00
Toluene	<0.5	N/A				
Toluene-d8	88.00	17.62				
Total Kjeldahl Nitrogen	3.70	5.56	3.76	3.82	1.58	1.90
Total P - Soluble	0.48	167.47	0.03	0.04	13.70	0.13
Total Suspended Solids	17.00	21.05	16.00	19.00	17.14	22.00
Vinyl Chloride	<0.2	N/A				
Zn	0.02	0.00	0.02	0.02	0.00	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1485323.00**		**1487983.00**	**1487996.00**		**1492670.00**
Sample Location	**DUP-1**		**SWMC1**	**DUP-1**		**SWMC5**
Sample Date	**2020-03-17**		**2020-04-07**	**2020-04-07**		**2020-05-08**
Analyte		**RPD**			RPD	
1,2-dichloroethane-d4			108.00	108.00	0.00	
1,4-dichlorobenzene			<0.4	<0.4	N/A	
4-bromofluorobenzene			105.00	105.00	0.00	
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.02	0.00	0.01	0.01	0.00	0.12
Alkalinity as CaCO3	164.00	5.92	167.00	165.00	1.20	228.00
As	<0.001	N/A	<0.001	<0.001	N/A	<0.001
B	0.09	10.53	0.04	0.04	0.00	0.92
Ba	0.04	0.00	0.05	0.05	0.00	0.08
Benzene			<0.5	<0.5	N/A	
Ca	69.00	1.44	76.00	76.00	0.00	75.00
CBOD5	7.00	0.00	<1	<1	N/A	1.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	24.00	0.00	20.00	20.00	0.00	137.00
Co	0.00	22.22	0.00	0.00	66.67	0.00
COD	30.00	35.62	49.00	32.00	41.98	69.00
Conductivity	507.00	0.20	491.00	495.00	0.81	1430.00
Cr	0.00	0.00	0.00	0.00	66.67	0.00
Cu	0.00	0.00	0.00	0.00	66.67	0.00
Dichloromethane			<4.0	<4.0	N/A	
DOC	12.20	4.02	12.70	12.20	4.02	26.70
Fe	0.55	10.34	1.16	0.61	62.15	0.36
Filtration	Y	N/A				Y
Hardness as CaCO3	209.00	1.43	231.00	227.00	1.75	303.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	4.00	0.00	3.00	3.00	0.00	47.00
Mg	9.00	0.00	10.00	9.00	10.53	28.00
Mn	0.07	0.00	0.11	0.07	44.44	0.06
Na			14.00	14.00	0.00	160.00
N-NH3	24.00	4.26	0.31	0.53	51.31	<0.010
-NH3 (un-ionized ammoni	0.51	0.20	<0.10	<0.10	N/A	NC
N-NO2	<0.10	N/A				<0.10
N-NO3	5.85	9.87	3.55	3.55	0.00	45.10
P	0.22	0.93	0.15	0.06	87.38	0.07
Pb	<0.001	N/A	<0.001	<0.001	N/A	<0.001
pH	8.00	0.63	7.97	8.01	0.50	8.33
Phenols	0.00	28.57	<0.001	<0.001	N/A	<0.001
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	44.00	2.30	44.00	44.00	0.00	98.00
TDS (COND - CALC)	330.00	0.00	319.00	322.00	0.94	930.00
Toluene			<0.5	<0.5	N/A	
Toluene-d8			103.00	97.00	6.00	
Total Kjeldahl Nitrogen	2.37	22.01	2.66	2.86	7.25	3.08
Total P - Soluble	0.15	16.25	0.01	0.01	12.31	0.03
Total Suspended Solids	22.00	0.00	88.00	40.00	75.00	20.00
Vinyl Chloride			<0.2	<0.2	N/A	
Zn	<0.01	#VALUE!	<0.01	<0.01	N/A	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1492683.00**		**1493684.00**	**1493695.00**		**1507640.00**
Sample Location	**DUP-1**		**SW1**	**DUP-1**		**SWMC5**
Sample Date	**2020-05-08**		**2020-05-14**	**2020-05-14**		**2020-07-30**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4						106.00
1,4-dichlorobenzene						<0.4
4-bromofluorobenzene						90.00
Ag	<0.0001	#VALUE!	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.07	52.63	0.16	0.16	0.00	0.45
Alkalinity as CaCO3	228.00	0.00	260.00	248.00	4.72	184.00
As	<0.001	N/A	<0.001	<0.001	N/A	0.00
B	1.00	8.33	0.97	0.96	1.04	0.56
Ba	0.08	0.00	0.07	0.07	0.00	0.08
Benzene						<0.5
Ca	75.00	0.00	68.00	69.00		71.00
CBOD5	3.00	N/A	4.00	1.00		6.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	136.00	0.73	134.00	138.00	2.94	94.00
Co	0.00	0.00	0.00	0.00	0.00	0.00
COD	71.00	2.86	63.00	71.00	11.94	70.00
Conductivity	1410.00	1.41	1460.00	1460.00	0.00	1050.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00
Cu	0.00	0.00	0.00	0.00	0.00	0.01
Dichloromethane						<4.0
DOC	26.60	0.38	27.30	26.70	2.22	25.50
Fe	0.34	5.71	0.40	0.39	2.53	1.41
Filtration	Y	N/A	Y	Y	N/A	Y
Hardness as CaCO3	303.00	0.00	269.00	267.00	0.75	256.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	48.00	2.11	43.00	42.00	2.35	29.00
Mg	28.00	0.00	24.00	23.00	4.26	19.00
Mn	0.06	0.00	0.08	0.08	0.00	0.10
Na	160.00	0.00	153.00	153.00	0.00	99.00
N-NH3	0.10	N/A	0.04	<0.010	N/A	1.50
-NH3 (un-ionized ammoni	0.01	N/A				
N-NO2	<0.10	N/A	<0.10	<0.10	N/A	0.13
N-NO3	47.60	5.39	46.50	42.30	9.46	24.40
P	0.07	2.86	0.06	0.06	1.68	0.35
Pb	<0.001	N/A	<0.001	<0.001	N/A	0.00
pH	8.17	1.94	8.31	8.36	0.60	7.92
Phenols	<0.001	N/A	0.01	0.01	57.14	0.01
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	98.00	0.00	103.00	106.00	2.87	102.00
TDS (COND - CALC)	916.00	1.52	949.00	949.00	0.00	682.00
Toluene						<0.5
Toluene-d8						103.00
Total Kjeldahl Nitrogen	3.22	4.44	3.46	5.23	40.74	5.57
Total P - Soluble	0.02	11.76	0.03	0.03	9.23	0.15
Total Suspended Solids	24.00	18.18	44.00	21.00	70.77	91.00
Vinyl Chloride						<0.2
Zn	<0.01	N/A	<0.01	<0.01	N/A	0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPD						

Field Duplicate Results -						
Lab ID	**1507653.00**		**1508116.00**	**1508128.00**		**1513025.00**
Sample Location	**DUP-1**		**SW1**	**DUP-1**		**SW1**
Sample Date	**2020-07-30**		**2020-08-04**	**2020-08-04**		**2020-08-26**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4	105.00	0.95				
1,4-dichlorobenzene	<0.4	N/A				
4-bromofluorobenzene	89.00	1.12				
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.37	19.51	0.21	0.19	10.00	0.09
Alkalinity as CaCO3	183.00	0.54	224.00	225.00	0.45	242.00
As	0.00	0.00	0.00	0.00	0.00	0.00
B	0.57	1.77	0.59	0.60	1.68	0.85
Ba	0.08	0.00	0.07	0.07	0.00	0.08
Benzene	<0.5	N/A				
Ca	73.00	2.78	92.00	92.00	0.00	81.00
CBOD5	11.00	58.82	4.00	3.00	28.57	5.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	94.00	0.00	78.00	77.00	1.29	102.00
Co	0.00	0.00	0.00	0.00	9.52	0.00
COD	65.00	7.41	63.00	66.00	4.65	59.00
Conductivity	1060.00	0.95	1080.00	1080.00	0.00	1290.00
Cr	0.00	0.00	0.00	0.00	40.00	0.00
Cu	0.01	0.00	0.00	0.00	0.00	0.00
Dichloromethane	<4.0	N/A				
DOC	24.50	4.00	25.00	24.90	0.40	22.00
Fe	1.43	1.41	0.67	0.60	11.02	0.63
Filtration	Y	N/A	Y	Y	N/A	Y
Hardness as CaCO3	261.00	1.93	329.00	324.00	1.53	301.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	30.00	3.39	29.00	29.00	0.00	37.00
Mg	19.00	0.00	24.00	23.00	4.26	24.00
Mn	0.11	9.52	0.05	0.05	0.00	0.06
Na	98.00	1.02	95.00	95.00	0.00	125.00
N-NH3	1.47	2.02	0.19	0.17	11.83	0.16
-NH3 (un-ionized ammoni						
N-NO2	0.14	7.41	<0.10	<0.10	N/A	0.16
N-NO3	25.70	5.19	25.10	25.90	3.14	32.90
P	0.37	5.81	0.17	0.18	5.78	0.27
Pb	0.00	0.00	<0.001	<0.001	N/A	<0.001
pH	7.94	0.25	7.97	8.01	0.50	8.09
Phenols	0.01	28.57	0.01	0.01	0.00	0.00
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	102.00	0.00	114.00	119.00	4.29	121.00
TDS (COND - CALC)	689.00	1.02	702.00	702.00	0.00	838.00
Toluene	<0.5	N/A				
Toluene-d8	101.00	1.96				
Total Kjeldahl Nitrogen	4.98	11.18	3.20	2.79	13.69	3.30
Total P - Soluble	0.16	6.45	0.08	0.07	7.79	0.14
Total Suspended Solids	107.00	16.16	53.00	61.00	14.04	47.00
Vinyl Chloride	<0.2	N/A				
Zn	0.01	0.00	<0.01	<0.01	N/A	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1513036.00**		**1521861**	**1521864**		**1526417.00**
Sample Location	**DUP-1**		**SWFD4**	**DUP-1**		**SWMC2A**
Sample Date	**2020-08-26**		**2020-10-13**	**2020-10-13**		**2020-11-03**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4						87.00
1,4-dichlorobenzene						<0.4
4-bromofluorobenzene						111.00
Ag	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Al (dissolved)	0.13	36.36	0.07	<0.01	N/A	<0.01
Alkalinity as CaCO3	234.00	3.36	192	191	0.52	234.00
As	0.00	0.00	<0.001	<0.001	N/A	<0.001
B	0.86	1.17	0.02	0.02	0.00	0.09
Ba	0.08	0.00	0.07	0.07	0.00	0.06
Benzene						<0.5
Ca	81.00	0.00	82	81	1.23	103.00
CBOD5	5.00	0.00	6	7	15.38	4.00
Cd	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
Cl	121.00	17.04	24	24	0.00	25.00
Co	0.00	8.00	<0.0002	<0.0002	N/A	0.00
COD	68.00	14.17	27	30	10.53	24.00
Conductivity	1270.00	1.56	517	519	0.39	687.00
Cr	0.00	0.00	<0.001	<0.001	N/A	<0.001
Cu	0.00	0.00	<0.001	<0.001	N/A	0.00
Dichloromethane						<4.0
DOC	23.40	6.17	11.7	11.7	0.00	10.00
Fe	0.64	1.57	0.32	0.36	11.76	0.34
Filtration	Y	N/A	Y	Y	N/A	Y
Hardness as CaCO3	301.00	0.00	242	239	1.25	319.00
Hg	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001
K	37.00	0.00	4	4	0.00	3.00
Mg	24.00	0.00	9	9	0.00	15.00
Mn	0.06	0.00	0.08	0.08	0.00	0.04
Na	127.00	1.59	11	11	0.00	16.00
N-NH3	0.16	0.00	<0.010	<0.010	N/A	0.11
-NH3 (un-ionized ammoni						0.00
N-NO2	0.17	6.06	<0.10	<0.10	N/A	<0.10
N-NO3	33.50	1.81	1.63	1.59	2.48	5.80
P	0.29	8.14	0.039	0.043	9.76	0.02
Pb	<0.001	N/A	<0.001	<0.001	N/A	<0.001
pH	8.11	0.25	8.07	8.12	0.62	8.24
Phenols	0.00	28.57	0.007	0.006	15.38	<0.001
Se	<0.001	N/A	<0.001	<0.001	N/A	<0.001
SO4	122.00	0.82	36	36	0.00	83.00
TDS (COND - CALC)	826.00	1.44	336	337	0.30	447.00
Toluene						<0.5
Toluene-d8						90.00
Total Kjeldahl Nitrogen	3.30	0.00	0.719	0.726	0.97	1.00
Total P - Soluble	0.16	12.46	0.036	0.014	88.00	0.01
Total Suspended Solids	34.00	32.10	8	11	31.58	8.00
Vinyl Chloride						<0.2
Zn	<0.01	N/A	<0.01	<0.01	N/A	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPI						

Field Duplicate Results -						
Lab ID	**1526425.00**		**1533866.00**	**1533879.00**		**1521861.00**
Sample Location	**DUP-1**		**SW1**	**DUP-1**		**SWFD4**
Sample Date	**2020-11-03**		**2020-12-09**	**2020-12-09**		**2020-10-13**
Analyte		**RPD**			**RPD**	
1,2-dichloroethane-d4	86.00	1.16				
1,4-dichlorobenzene	<0.4	NA				
4-bromofluorobenzene	106.00	4.61				
Ag	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Al (dissolved)	<0.01	NA	0.04	0.04	0.00	0.07
Alkalinity as CaCO3	236.00	0.85	237.00	250.00	5.34	192.00
As	<0.001	NA	<0.001	<0.001	NA	<0.001
B	0.05	57.14	0.68	0.63	7.63	0.02
Ba	0.06	0.00	0.09	0.10	10.53	0.07
Benzene	<0.5	NA			NA	
Ca	106.00	2.87	116.00	116.00	0.00	82.00
CBOD5	3.00	28.57	4.00	4.00	0.00	6.00
Cd	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Cl	<1	NA	140.00	144.00	2.82	24.00
Co	0.00	0.00	0.00	0.00	0.00	<0.0002
COD	23.00	4.26	53.00	54.00	1.87	27.00
Conductivity	693.00	0.87	1430.00	1440.00	0.70	517.00
Cr	<0.001	NA	0.00	0.00	0.00	<0.001
Cu	0.00	0.00	0.00	0.00	0.00	<0.001
Dichloromethane	<4.0	NA			NA	
DOC	10.40	3.92	18.90	18.50	2.14	11.70
Fe	0.34	0.00	0.29	0.34	15.87	0.32
Filtration	Y	NA	Y	Y	NA	Y
Hardness as CaCO3	326.00	2.17	409.00	409.00	0.00	242.00
Hg	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
K	3.00	0.00	38.00	39.00	2.60	4.00
Mg	15.00	0.00	29.00	29.00	0.00	9.00
Mn	0.04	0.00	0.06	0.07	15.38	0.08
Na	16.00	0.00	118.00	118.00	0.00	11.00
N-NH3	0.09	22.22	0.15	0.15	0.67	<0.010
-NH3 (un-ionized ammoni	0.00	22.22	0.00	0.00	0.67	N/A
N-NO2	<0.10	NA	<0.10	<0.10	NA	<0.10
N-NO3	5.55	4.41	52.10	54.70	4.87	1.63
P	0.02	0.00	0.07	0.09	28.57	0.04
Pb	<0.001	NA	<0.001	<0.001	NA	<0.001
pH	8.24	0.00	8.27	8.26	0.12	8.07
Phenols	<0.001	NA	0.00	0.00	0.00	0.01
Se	<0.001	NA	<0.001	<0.001	NA	<0.001
SO4	83.00	0.00	125.00	129.00	3.15	36.00
TDS (COND - CALC)	450.00	0.67	930.00	936.00	0.64	336.00
Toluene	<0.5	NA			NA	
Toluene-d8	94.00	4.35			NA	
Total Kjeldahl Nitrogen	0.97	3.46	2.92	3.18	8.52	0.72
Total P - Soluble	0.01	0.00	0.05	0.05	10.10	0.04
Total Suspended Solids	9.00	11.76	42.00	34.00	21.05	8.00
Vinyl Chloride	<0.2	NA			NA	
Zn	<0.01	NA	0.01	0.01	0.00	<0.01
RPD - Relative Percent D						
RPD = abs (X1 - X2)/((X1						
X1 = Sample Parameter V						
X2 = Duplicate Parameter						
BOLD or Red = SLR RPD						

Field Duplicate Results -		
Lab ID	**1521864.00**	
Sample Location	**DUP-1**	
Sample Date	**2020-10-13**	
Analyte		**RPD**
1,2-dichloroethane-d4		
1,4-dichlorobenzene		
4-bromofluorobenzene		
Ag	<0.0001	NA
Al (dissolved)	<0.01	#VALUE!
Alkalinity as CaCO3	191.00	0.52
As	<0.001	NA
B	0.02	0.00
Ba	0.07	0.00
Benzene		NA
Ca	81.00	1.23
CBOD5	7.00	15.38
Cd	<0.0001	NA
Cl	24.00	0.00
Co	<0.0002	NA
COD	30.00	10.53
Conductivity	519.00	0.39
Cr	<0.001	NA
Cu	<0.001	NA
Dichloromethane		NA
DOC	11.70	0.00
Fe	0.36	11.76
Filtration	Y	NA
Hardness as CaCO3	239.00	1.25
Hg	<0.0001	NA
K	4.00	0.00
Mg	9.00	0.00
Mn	0.08	0.00
Na	11.00	0.00
N-NH3	<0.010	NA
-NH3 (un-ionized ammoni	N/A	NA
N-NO2	<0.10	NA
N-NO3	1.59	2.48
P	0.04	9.76
Pb	<0.001	NA
pH	8.12	0.62
Phenols	0.01	15.38
Se		NA
SO4	36.00	0.00
TDS (COND - CALC)	337.00	0.30
Toluene		NA
Toluene-d8		NA
Total Kjeldahl Nitrogen	0.73	0.97
Total P - Soluble	0.01	88.00
Total Suspended Solids	11.00	31.58
Vinyl Chloride		
Zn	<0.01	NA
RPD - Relative Percent D		
RPD = abs (X1 - X2)/((X1		
X1 = Sample Parameter V		
X2 = Duplicate Parameter		
BOLD or Red = SLR RPD		

Appendix H

Water Quality Summary Statistics for all Water Quality Variables for Period of Record Data

SW1

LAB ID:

	Meets PWQO
measured / estimated flow	Exceeds PWQO
effluent discharge (L/sec)	Meets CCME or MOE BC long te
mg/L	Exceeds CCME or MOE BC long te
	Water Quality Objective / Guideline

Sample Date

Analyte	PARAMETER	PWQO	MRL	Effluent Limit	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline Short/Long Term (mg/L)		SW1 Pre-Effluent Discharge Prior to August 1, 2007 MEAN	STANDARD DEVIATION	Grp A Median	Grp A 90th %	N	SW1 Early Treated Effluent Discharge August 1, 2007 to December 31, 2015 MEAN	Standard Deviation	Grp. B Median	Grp B 90th %	N	SW1: Statistics - Upgraded Treated Leachate Period 1 January 1, 2016 to May 22, 2019 (1/1/2016 - 22/05/2019) MEAN	Standard Deviation	+ve SD	-ve SD	Grp C Median	Grp C 90th %
1,2-dichloroethane-d4 (%)																								
1,4-dichlorobenzene (µg/L)					4.00				#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
4-bromofluorobenzene (%)																								
Ag (mg/L)									#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Al (dissolved)	Al (dissolved)	0.075*	0.01						0.22	0.21	0.16	0.47	16.00	0.06	0.07	0.04	0.12	34.00	0.06	0.05	0.11	0.01	0.04	0.12
Alkalinity as C	Alkalinity as CaCO3		5						198.57	68.96	190.50	224.10	30.00	205.00	26.96	201.00	238.30	34.00	223.45	68.21	291.67	155.24	211.00	225.00
As (mg/L)	Arsenic	0.1	0.001						0.00	#DIV/0!	0.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	1.200	0.044	0.012	0.040	0.058	17.000	0.080	0.135	0.050	0.117	34.000	0.485	1.365	1.850	-0.880	0.060	0.140
Ba (mg/L)	Barium		0.01						0.05	0.01	0.05	0.06	20.00	0.05	0.01	0.05	0.07	34.00	0.06	0.03	0.09	0.03	0.05	0.07
Benzene (µg/L)					100.00	ND/370	ND/40		#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Ca (mg/L)	Calcium		1						73.57	6.80	71.00	81.60	7.00	77.24	13.50	74.00	101.00	34.00	88.91	10.09	99.00	78.81	89.00	97.00
CBOD5 (mg/L	Biochemical Oxygen D	1		10.0					1.86	0.86	2.00	2.70	14.00	2.21	1.24	2.00	3.20	29.00	2.50	2.27	4.77	0.23	1.50	5.60
Cd (mg/L)	Cadmium	0.0002*	0.0001		0.00020	.001/.0000	calculation		0.00	#DIV/0!	0.00	0.00	1.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Cl (mg/L)	Chloride		1			640/120	600/150	120.00	20.59	21.26	17.00	26.10	30.00	21.12	11.95	18.00	24.70	34.00	88.00	205.03	293.03	-117.03	28.00	35.00
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004		0.0009	0.0011	0.0005	0.0022	18.0000	0.0005	0.0003	0.0004	0.0008	31.0000	0.0010	0.0019	0.0029	-0.0009	0.0003	0.0017
COD (mg/L)	Chemical Oxygen Dem		5						41.77	10.41	41.00	54.30	30.00	37.79	10.41	36.00	51.10	34.00	53.09	46.83	99.92	6.26	38.00	59.00
Conductivity (	Conductivity (µS/cm)		5						537.29	249.28	479.00	611.10	28.00	543.82	118.62	520.00	636.60	34.00	944.64	1152.39	2097.03	-207.75	592.00	765.00
Cr (mg/L)	Chromium	0.0089**	0.001		0.009	ND/.001			0.003	0.003	0.002	0.008	14.000	0.003	0.002	0.002	0.004	30.000	0.003	0.004	0.007	-0.001	0.002	0.007
Cu (mg/L)	Copper (mi	0.005	0.001	0.2		ND/.004	0.029/≤0.0	0.0020	0.0033	0.0017	0.0030	0.0050	20.0000	0.0026	0.0008	0.0020	0.0030	34.0000	0.0023	0.0009	0.0032	0.0014	0.0020	0.0040
Dichloromethane (µg/L)					100.00	ND/9811			#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
DOC (mg/L)	Dissolved Organic Carl		0.50						13.30	#DIV/0!	13.30	13.30	1.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Fe (mg/L)	Iron (mg/L	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.300	1.145	1.032	0.820	1.788	29.000	1.104	0.954	0.660	2.270	34.000	0.500	0.205	0.705	0.295	0.470	0.800
Filtration									#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Hardness as	Hardness as CaCO3		1						229.00	22.58	225.00	251.60	7.00	244.56	39.16	235.00	313.00	34.00	305.18	100.45	405.63	204.73	272.00	344.00
Hg (mg/L)	Mercury	0.0002	0.0001		0.00020	ND/.00002	ND/calculation		#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00000	#DIV/0!	#DIV/0!	0.50000	#NUM!	0.00000	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
K (mg/L)	Potassium		1						2.71	0.76	3.00	3.40	7.00	4.00	4.56	3.00	5.00	34.00	26.82	74.39	101.21	-47.57	4.00	10.00
Mg (mg/L)	Magnesium		1						11.00	1.83	10.00	13.40	7.00	12.53	2.44	12.00	15.00	34.00	20.18	21.69	41.87	-1.51	13.00	20.00
Mn (mg/L)	Manganese		0.01						#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Na (mg/L)	Sodium		2		180.00			180.00	14.50	3.16	14.00	18.60	8.00	21.62	21.79	17.00	30.00	34.00	81.27	196.02	277.30	-114.75	23.00	37.00
N-NH3 (mg	N-NH3 (Ammonia) (mi	0.02	1.0						0.150	0.111	0.110	0.322	30.000	0.271	0.495	0.130	0.422	34.000	0.511	0.524	1.035	-0.014	0.250	0.960
N-NH3 (Unior	NH3 (un-io	0.02			0.0200				#REF!	#REF!	#REF!	#REF!	0.0000	#REF!	#REF!	#REF!	#REF!	31.0000	0.0042	0.0031	0.0073	0.0011	0.0038	0.0082
N-NO2 (mg/L	N-NO2 (Nitrite)		0.10				0.6/0.2		#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.16	#DIV/0!	0.33	0.16	1.00	0.24	0.17	0.41	0.07	0.24	0.34
N-NO3 (mg	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	3.00	1.69	1.17	1.53	3.51	28.00	2.54	3.56	1.45	3.73	33.00	11.95	28.15	40.10	-16.21	3.91	6.08
P - Total (m	Total Phos	0.03*	0.01	0.3	0.030			0.030	0.193	0.131	0.170	0.364	29.000	0.133	0.108	0.090	0.211	34.000	0.075	0.032	0.108	0.043	0.070	0.105
Pb (mg/L)	Lead	0.025	0.001		0.0250	ND/.007	0.003/ND		0.0014	0.0011	0.0015	0.0025	6.0000	0.0020	0.0014	0.0030	0.0028	2.0000	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
pH	pH (pH unit	6.5-8.5							7.87	0.30	7.93	8.21	29.00	8.10	0.15	8.09	8.23	34.00	8.16	0.14	8.30	8.03	8.15	8.32
Phenols (mg/	Phenols (m	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND		0.0085	0.0078	0.0085	0.0129	2.0000	#DIV/0!	#DIV/0!	0.5000	#NUM!	0.0000	0.0030	0.0017	0.0047	0.0013	0.0020	0.0044
Se (mg/L)	Selenium	0.1	0.001						0.00	#DIV/0!	0.00	0.00	1.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
SO4 (mg/L	Sulphate		1				429.00	429.00	52.46	39.63	37.50	94.60	30.00	42.74	17.07	37.00	62.70	34.00	120.00	194.03	314.03	-74.03	53.00	131.00
TDS (COND	TDS (COND - CALC)		5						359.59	162.19	320.00	405.40	27.00	353.56	77.07	338.00	413.60	34.00	654.27	882.49	1536.76	-228.22	385.00	497.00
Toluene (µg/L)					0.80	ND/.002	ND/0.0005		#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Toluene-d8 (%	Silver	0.0001	0.0001						#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Total Kjeldahl	Total Kjeldahl Nitroger	0.10							1.27	0.67	1.15	1.58	30.00	1.14	0.59	0.94	1.98	34.00	2.68	2.03	4.71	0.64	2.30	3.65
Total P - Soluble (mg/L)									#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Total Suspen	Total Suspended Solid:	2		10.0					35.43	27.49	29.00	63.70	30.00	28.65	22.69	21.00	55.50	34.00	13.90	10.49	24.39	3.41	12.00	26.20
Vinyl Chloride (µg/L)					600.00				#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Zn (mg/L)	Zinc (mg/L	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075		0.02	0.02	0.02	0.04	4.00	0.01	0.00	0.01	0.02	7.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
										#DIV/0!	#NUM!	#NUM!	0.00											
										#DIV/0!	#NUM!	#NUM!	0.00											
Field Data	Field Data:									#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	0.50	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Temperature	Temperature (ºC)								9.81	7.93	8.40	19.90	26.00	8.32	7.30	4.55	17.24	33.00	6.80	8.78	15.58	-1.98	3.50	20.32
pH	pH (field) (u	6.5-8.5							7.53	0.43	7.60	7.98	22.00	7.64	0.38	7.67	7.94	33.00	7.67	0.18	7.85	7.49	7.67	7.83
Conductivity (	Conductivity (field) (µS/cm)								570.92	307.36	472.50	910.00	24.00	615.88	165.52	567.00	800.70	34.00	910.30	1015.74	1926.04	-105.44	621.00	1056.80
Dissolved Ox	Dissolved Oxygen (mg/L)			4.00					9.53	2.64	10.35	12.13	23.00	8.56	3.76	8.38	12.64	34.00	12.38	3.11	15.49	9.27	12.32	14.71

SW1

LAB ID:

measured / es
effluent disch

SW1: Statistics - Upgraded Treated Leachate Period 2
May 23, 2019 to December 9, 2020
23/5/2019 - 9/12/2020)

SW1: Statistics - Upgraded Treated Leachate 2020 only
2020-01-10 to December 9, 2020

Sample Date

Analyte	PARAMETER	PWQO	MRL	MEAN	Standard Deviation	+ve SD	-ve SD	Grp D Median	Grp D 90th %	Count >MR	Count > Ob	Objective	MEAN	Standard D	+ve SD	-ve SD	Grp D Med	Grp D 90th	Count	Count > Ob	Objective
1,2-dichloroethane-d4 (%)													113.25	18.52					4.00		
1,4-dichlorobenzene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
4-bromofluorobenzene (%)													99.25	6.90	106.15	92.35	101.00	104.70	4.00		
Ag (mg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Al (dissolved)	Al (dissolved)	0.075*	0.01	0.11	0.13	0.23	-0.02	0.05	0.30	16.00			0.13	0.14	0.27	-0.01	0.08	0.37	12.00		
Alkalinity as C	Alkalinity as CaCO3		5	218.31	38.58	256.89	179.73	223.00	263.80	29.00			219.17	41.23	260.40	177.93	232.00	258.60	12.00		
As (mg/L)	Arsenic	0.1	0.001	0.00	0.00	0.00	0.00	0.00	0.00	3.00			0.00	0.00	0.00	0.00	0.00	0.00	3.00		
B (mg/L)	Boron	0.2*	0.01	0.868	0.792	1.661	0.076	0.680	1.934	29.000	6.000	1.200	0.787	0.547	1.333	0.240	0.750	1.627	12.000	2.000	1.200
Ba (mg/L)	Barium		0.01	0.08	0.02	0.11	0.06	0.08	0.13	29.00			0.08	0.03	0.11	0.05	0.08	0.13	12.00		
Benzene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Ca (mg/L)	Calcium		1	85.92	15.97	101.89	69.95	84.00	107.60	29.00			85.67	16.44	102.11	69.22	79.50	106.80	12.00		
CBOD5 (mg/L	Biochemical Oxygen D	1		3.75	1.91	5.66	1.84	4.00	6.50	16.00			4.08	2.07	6.15	2.02	4.00	6.90	12.00		
Cd (mg/L)	Cadmium	0.0002*	0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Cl (mg/L)	Chloride		1	131.16	112.96	244.12	18.19	101.00	271.00	29.00	12.00	120.00	107.50	61.05	168.55	46.45	106.50	188.60	12.00	5.00	120.00
Co (mg/L)	Cobalt	0.0009	0.0002	0.0011	0.0004	0.0015	0.0007	0.0012	0.0015	17.0000			0.0011	0.0004	0.0016	0.0007	0.0012	0.0015	12.0000		
COD (mg/L)	Chemical Oxygen Dem		5	56.57	21.07	77.64	35.50	54.00	74.60	28.00			57.33	14.99	72.33	42.34	61.00	73.80	12.00		
Conductivity (	Conductivity (µS/cm)		5	1347.69	728.64	2076.33	619.05	1140.00	2284.00	29.00			1242.42	470.05	1712.46	772.37	1340.00	1874.00	12.00		
Cr (mg/L)	Chromium	0.0089**	0.001	0.003	0.002	0.005	0.002	0.003	0.005	29.000	0.000		0.003	0.002	0.005	0.001	0.003	0.005	12.000		
Cu (mg/L)	Copper (m	0.005	0.001	0.0031	0.0012	0.0044	0.0019	0.0030	0.0043	29.0000	18.0000	0.0020	0.0026	0.0008	0.0034	0.0018	0.0020	0.0039	12.0000	5.0000	0.0020
Dichloromethane (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
DOC (mg/L)	Dissolved Organic Carl		0.50	20.32	6.22	26.54	14.10	18.70	27.84	29.00			21.67	6.35	28.01	15.32	23.50	27.48	12.00		
Fe (mg/L)	Iron (mg/L	0.3	0.03	0.797	0.450	1.246	0.347	0.670	1.342	29.000	27.000	0.300	0.544	0.216	0.760	0.328	0.525	0.832	12.000	11.000	0.300
Filtration				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Hardness as	Hardness as CaCO3		1	324.62	64.80	389.42	259.82	321.00	412.60	29.00			311.67	64.20	375.87	247.46	300.50	405.00	12.00		
Hg (mg/L)	Mercury	0.0002	0.0001	0.00003	0.00001	0.00003	0.00002	0.00003	0.00003	2.00000	0.00000		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00000		
K (mg/L)	Potassium		1	40.95	36.21	77.16	4.74	35.00	89.52	29.00			34.92	21.60	56.51	13.32	36.50	60.60	12.00		
Mg (mg/L)	Magnesium		1	26.74	13.05	39.79	13.69	24.00	45.12	29.00			23.75	8.53	32.28	15.22	24.00	35.30	12.00		
Mn (mg/L)	Manganese		0.01	0.07	0.02	0.09	0.04	0.06	0.09	29.00			0.07	0.02	0.08	0.05	0.06	0.08	12.00		
Na (mg/L)	Sodium		2	136.55	119.98	256.53	16.57	110.00	284.20	29.00	6.00	180.00	115.92	65.53	181.44	50.39	121.50	186.90	12.00	2.00	180.00
N-NH3 (mg	N-NH3 (Ammonia) (m	0.02		0.196	0.148	0.344	0.047	0.170	0.337	29.000			0.224	0.216	0.440	0.008	0.159	0.502	12.000		
N-NH3 (Union	NH3 (un-io	0.02		0.0048	0.0109	0.0157	-0.0061	0.0012	0.0047	21.0000	2.0000	0.0200	0.0074	0.0141	0.0214	-0.0067	0.0014	0.0291	12.0000	2.0000	0.0200
N-NO2 (mg/L	N-NO2 (Nitrite)		0.10	0.17	0.01	0.17	0.16	0.17	0.17	2.00			0.17	0.01	0.17	0.16	0.17	0.17	2.00		
N-NO3 (mg	N-NO3 (Nitrate)		0.10	38.20	30.99	69.18	7.21	29.80	80.12	29.00	27.00	3.00	39.06	27.35	66.41	11.71	38.70	74.33	12.00	11.00	3.00
P - Total (m	Total Phos	0.03*	0.01	0.115	0.056	0.171	0.059	0.090	0.177	29.000	29.000	0.030	0.126	0.076	0.201	0.050	0.083	0.233	12.000	12.000	0.030
Pb (mg/L)	Lead	0.025	0.001	0.0005	0.0005	0.0010	0.0001	0.0004	0.0009	12.0000	0.0000		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.0000		
pH	pH (pH uni	6.5-8.5		8.09	0.26	8.35	7.83	8.14	8.32	17.00			8.03	0.28	8.31	7.76	8.10	8.29	12.00		
Phenols (mg/	Phenols (m	0.001	0.001	0.0036	0.0015	0.0051	0.0021	0.0035	0.0050	12.0000			0.0039	0.0014	0.0053	0.0025	0.0040	0.0051	10.0000		
Se (mg/L)	Selenium	0.1	0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
SO4 (mg/L	Sulphate		1	122.72	69.95	192.67	52.78	111.00	174.60	29.00	0.00	429.00	99.08	29.20	128.29	69.88	106.50	124.60	12.00	0.00	429.00
TDS (COND	TDS (COND - CALC)		5	867.14	479.45	1346.59	387.69	741.00	1407.20	29.00			808.00	306.29	1114.29	501.71	871.00	1219.90	12.00		
Toluene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Toluene-d8 (%	Silver	0.0001	0.0001	100.57	4.20	104.77	96.37	101.00	103.80	7.00			102.25	2.22	104.47	100.03	102.00	104.40	4.00		
Total Kjeldahl	Total Kjeldahl Nitroger	0.10		2.69	1.08	3.76	1.61	2.40	4.02	29.00			2.93	0.87	3.79	2.06	3.25	3.73	12.00		
Total P - Soluble (mg/L)				0.06	0.03	0.09	0.03	0.05	0.10	17.00			0.06	0.04	0.10	0.02	0.05	0.13	12.00		
Total Suspen	Total Suspended Solid:	2		29.38	15.40	44.78	13.98	30.00	51.40	29.00			34.75	15.35	50.10	19.40	38.50	52.80	12.00		
Vinyl Chloride (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Zn (mg/L)	Zinc (mg/L	0.03	0.01	0.02	0.01	0.03	0.01	0.02	0.03	18.00			0.02	0.01	0.02	0.01	0.02	0.02	3.00		
										0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
										0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Field Data	Field Data:									0.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Temperature	Temperature (ºC)			10.51	8.16	18.67	2.34	9.60	21.42	24.00			7.53	7.78	15.31	-0.24	6.45	19.45	12.00		
pH	pH (field) (µ	6.5-8.5		7.75	0.80	8.55	6.94	7.99	8.68	26.00			7.65	0.96	8.61	6.69	7.56	8.84	12.00		
Conductivity	Conductivity (field) (µS/cm)			846.72	515.51	1362.23	331.21	975.50	1408.30	22.00			936.92	502.67	1439.59	434.24	1149.00	1393.60	12.00		
Dissolved Ox	Dissolved Oxygen (mg/L)			10.01	3.11	13.13	6.90	10.46	13.76	19.00			10.15	3.24	13.39	6.91	10.37	13.41	12.00		

SW2		LAB ID:		Regulated		Meets PWQO		SW2 Pre - treated Effluent Discharg								SW2 Early Treated Effluent								SW2 Upgraded Treated Effluent							
ured / estimated flow		Sampled:		Effluent		**Exceeds PWQO**		Prior to August 1, 2007								August 1, 2007 to Dec. 2015								January 1, 2016 to May 2019							
ent discharge (L/sec)		ample ID:		Parameter		**Meets CCME or MOE**		L - AR								AS - CB								BZ - CI							
				mg/L		Exceeds CCME or MOE	BC long term guideline																									
Nearfield Effects Station																															
Sample Date					**PWQO (APV for Cl and Na)**	**CCME Surface Water Quality Guideline - Short/Long Term (mg/L)**	**Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)**																									
Analyte	ARAMETE	PWQO	MRL					RANGE	Mean	Standard Deviation	+ve SD	-ve SD	Grp 1 Med	Grp 1 90th %	N	Post TLA M	Standard D	+ve SD	-ve SD	Grp 2 Med	Grp 2 90th	N		Post TLA Me	Standard De	+ve SD	-ve SD	Grp 3 Media	Grp 3 90th %	N	
1,2-dichloroethane-d4 (%)																															
1,4-dichlorobenzene (µg/L)					4.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
4-bromofluorobenzene (%)																															
Ag (mg/L)	Silver (mg/	0.0001	0.0001						#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Al (dissolve	Al (dissolve	0.075*	0.01						0.26	0.23	0.49	0.03	0.21	0.59	15.00	0.13	0.17	0.30	-0.04	0.05	0.32	52.00		0.08	0.11	0.19	-0.04	0.03	0.18	8.00	
Alkalinity as	Alkalinity as CaCO3 (m		5						198.45	116.08	314.53	82.37	165.00	240.60	29.00	216.11	98.17	314.28	117.94	187.00	281.60	63.00		280.03	142.19	422.23	137.84	225.00	525.30	30.00	
As (mg/L)	Arsenic	0.1	0.001						0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00		0.00	0.00	0.00	0.00	0.00	0.00	3.00	
B (mg/L)	Boron (mg/	0.2*	0.01		0.2*	29/1.5	ND/1.2		0.06	0.03	0.09	0.03	0.05	0.08	19.00	0.55	1.60	2.15	-1.05	0.07	1.13	58.00		2.70	2.65	5.35	0.05	1.80	6.20	29.00	
Ba (mg/L)	Barium (mg/L)		0.01						0.04	0.01	0.05	0.03	0.04	0.05	20.00	0.06	0.05	0.10	0.01	0.04	0.08	58.00		0.14	0.09	0.23	0.04	0.10	0.25	30.00	
Benzene (µg/L)					100.00	ND/370	ND/40									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00									
Ca (mg/L)	Calcium		1						64.17	5.42	69.59	58.75	62.50	69.00	6.00	1148.72	7819.31	8968.03	-6670.60	73.00	103.20	53.00		1991.78	10389.44	12381.22	-8397.66	87.00	143.60	30.00	
CBOD5 (mg/	Biochemical Oxygen Den		1	10.0					2.36	0.84	3.20	1.52	2.00	3.00	14.00	2.84	1.93	4.76	0.91	2.00	5.60	43.00		5.36	7.28	12.64	-1.92	3.00	7.00	14.00	
Cd (mg/L)	Cadmium	0.0002	0.0001		0.0002	.001/.0000	calculation		0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00		0.00	0.00	0.00	0.00	0.00	0.00	4.00	
Cl (mg/L)	Chloride (mg/L)		1			640/120	600/150		24.65	34.89	59.54	-10.24	16.00	43.20	29.00	79.14	177.12	256.26	-97.98	26.00	187.20	63.00		356.42	345.97	702.39	10.45	203.50	925.10	30.00	
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004		0.0009	0.0007	0.0016	0.0003	0.0008	0.0016	17.0000	0.0006	0.0003	0.0009	0.0003	0.0005	0.0010	43.0000		0.0017	0.0032	0.0049	-0.0015	0.0005	0.0041	7.0000	
COD (mg/L	Chemical Oxygen Dem		5						55.39	17.86	73.26	37.53	50.50	79.30	28.00	65.45	63.55	129.00	1.90	48.00	84.80	62.00		136.47	96.17	232.63	40.30	98.00	253.20	30.00	
Conductivit	Conductivity (µS/cm)		5						557.00	420.32	977.32	136.68	446.00	683.80	27.00	960.89	1305.22	2266.11	-344.33	541.00	2068.00	63.00		2892.47	2291.44	5183.91	601.02	2080.00	6165.00	30.00	
Cr (mg/L)	Chromium	0.0089**	0.001		0.0089	ND/.001			0.004	0.003	0.007	0.001	0.003	0.008	13.000	0.003	0.002	0.005	0.001	0.003	0.006	47.000		0.008	0.005	0.013	0.002	0.006	0.015	23.000	
Cu (mg/L)	Copper* (m	0.005	0.001	0.2		ND/.004	0.029/≤0.002		0.0040	0.0017	0.0058	0.0023	0.0039	0.0061	20.0000	0.0028	0.0015	0.0044	0.0013	0.0020	0.0050	54.0000		0.0046	0.0026	0.0072	0.0019	0.0040	0.0078	25.0000	
Dichloromethane (µg/L)					100.00	ND/9811			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
DOC (mg/L	Dissolved Organic Carl		0.50						22.30	#DIV/0!	#DIV/0!	#DIV/0!	22.30	22.30	1.00	55.48	37.76	93.24	17.71	46.80	110.90	8.00		44.84	26.84	71.67	18.00	37.90	63.33	22.00	
Fe (mg/L)	Iron* (mg/L	0.3	0.03	1.0	0.30	ND/0.3	0.001/ND		1.96	3.20	5.16	-1.24	1.23	2.77	29.00	1.43	2.86	4.28	-1.43	0.68	1.89	58.00		0.50	0.36	0.86	0.13	0.44	1.02	25.00	
Filtration									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Hardness a	Hardness as CaCO3		1						203.33	23.42	226.76	179.91	196.00	226.50	6.00	235.11	50.73	285.85	184.38	232.00	303.60	45.00		343.50	167.20	510.70	176.30	276.50	466.00	8.00	
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.00002	ND/calculation		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.0000	0.0002	0.0000	0.0002	0.0002	0.0002	0.0002	3.0000		0.0056	0.0166	0.0223	-0.0110	0.0001	0.0102	9.0000	
K (mg/L)	Potassium (mg/L)		1						2.67	1.37	4.03	1.30	2.50	4.00	6.00	512.02	3527.17	4039.19	-3015.15	4.00	74.80	53.00		985.57	4669.56	5655.13	-3684.00	75.00	347.50	30.00	
Mg (mg/L)	Magnesium (mg/L)		1						10.50	2.59	13.09	7.91	9.50	13.50	6.00	19.79	25.21	45.00	-5.42	12.00	33.30	52.00		55.90	43.81	99.71	12.09	35.10	123.40	29.00	
Mn (mg/L)	Manganese		0.01						#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.06	0.01	0.07	0.05	0.06	0.07	4.00		0.06	0.04	0.09	0.02	0.05	0.11	17.00	
Na (mg/L)	Sodium (mg/L)		2		180.00				19.29	7.02	26.30	12.27	16.00	29.00	7.00	1436.49	9741.77	11178.26	-8305.28	26.00	285.80	53.00		2754.15	12895.09	15649.24	-10140.94	229.00	1057.00	30.00	
N-NH3 (mg/	N-NH3 (Ammonia)* (mg	0.02	0.02	1.0					0.17	0.15	0.31	0.02	0.11	0.34	28.00	0.65	1.32	1.97	-0.67	0.19	1.89	63.00		1.09	1.13	2.22	-0.04	0.66	2.39	30.00	
N-NH3 (Un	NH3 (un-io	0.02			0.0200				0.0039	0.0118	0.0157	-0.0078	0.0006	0.0065	23.0000	0.0114	0.0264	0.0378	-0.0151	0.0015	0.0258	58.0000		0.0324	0.0555	0.0879	-0.0231	0.0149	0.0770	27.0000	
N-NO2 (mg	N-NO2 (Nitrite)		0.10				0.6/0.2		0.110	#DIV/0!	#DIV/0!	#DIV/0!	0.110	0.110	1.000	1.230	2.171	3.401	-0.941	0.405	3.160	6.000		1.119	1.847	2.966	-0.728	0.585	2.287	8.000	
N-NO3 (mg/	N-NO3 (Nitrate) (mg/L)		0.10			124/3.0	32.8/3.0		1.32	1.42	2.74	-0.11	0.90	2.63	27.00	19.91	65.38	85.30	-45.47	1.34	17.80	61.00		98.44	102.26	200.70	-3.82	72.70	241.30	30.00	
P - Total (mg	Total Phosp	0.03*	0.01	0.3	0.030				0.263	0.171	0.434	0.091	0.230	0.504	27.000	0.220	0.151	0.371	0.068	0.177	0.420	61.000		0.211	0.088	0.299	0.123	0.215	0.320	30.000	
Pb (mg/L)	Lead	0.025	0.001		0.0250	ND/.007	0.003/ND		0.0053	0.0047	0.0100	0.0005	0.0040	0.0116	8.0000	0.0043	0.0041	0.0084	0.0001	0.0030	0.0106	12.0000		0.0320	0.1174	0.1495	-0.0854	0.0008	0.0011	14.0000	
pH	pH (pH unit	6.5-8.5							7.79	0.43	8.22	7.36	7.87	8.31	28.00	8.02	0.21	8.24	7.81	8.02	8.30	55.00		8.09	0.22	8.31	7.87	8.13	8.31	8.00	
Phenols (mg	Phenols* (m	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND		0.0115	0.0120	0.0235	-0.0005	0.0115	0.0183	2.0000	0.0033	0.0039	0.0072	-0.0006	0.0020	0.0066	9.0000		0.0068	0.0075	0.0143	-0.0007	0.0045	0.0135	16.0000	
Se (mg/L)	Selenium (r	0.1	0.001						0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
SO4 (mg/L)	Sulphate (mg/L)		1				429.00		52.37	56.64	109.01	-4.28	37.00	100.40	29.00	85.37	107.66	193.03	-22.30	44.00	188.00	63.00		298.57	280.70	579.27	17.86	186.50	773.00	30.00	
TDS (CON	TDS (COND - CALC) (		5						384.65	296.42	681.07	88.24	309.50	449.50	26.00	645.51	938.05	1583.56	-292.54	352.00	1366.00	63.00		1982.80	1700.64	3683.44	282.16	1350.00	4606.00	30.00	
Toluene (µg/L)					0.80	ND/.002	ND/0.0005		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Toluene-d8 (%)									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Total Kjelda	Total Kjeldahl Nitrogen		0.10						1.59	1.31	2.90	0.29	1.29	1.95	29.00	4.32	13.25	17.57	-8.92	1.38	7.82	63.00		10.26	18.29	28.56	-8.03	6.48	12.24	30.00	
Total P - Soluble (mg/L)									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Total Suspe	Total Suspended Solids	2		10.0					64.00	81.72	145.72	-17.72	41.00	134.50	30.00	39.36	62.42	101.78	-23.06	23.00	78.00	61.00		20.96	15.78	36.74	5.19	18.50	35.50	28.00	
Vinyl Chloride (µg/L)					600.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Zn (mg/L)	Zinc* (mg/L	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075		0.01	0.00	0.02	0.01	0.01	0.02	8.00	0.01	0.00	0.02	0.01	0.01	0.01	7.00		0.05	0.03	0.09	0.02	0.05	0.09	17.00	
Chromium (mg/L)		0.01																													
Field Data	**Field Data**																														
Temperatu	Temperature (ºC)								11.47	8.32	19.79	3.15	10.50	21.62	23.00	9.45	7.78	17.22	1.67	8.50	19.50	62.00		10.65	9.33	19.98	1.32	7.55	23.00	30.00	
pH	pH (field) (p	6.5-8.5							7.36	0.41	7.77	6.94	7.47	7.78	22.00	7.64	0.42	8.06	7.22	7.65	8.13	61.00		7.89	0.48	8.37	7.41	7.90	8.15	30.00	
Conductivit	Conductivity (field) (µS/cm)								631.14	479.88	1111.01	151.26	504.00	906.20	22.00	1201.52	1584.33	2785.84	-382.81	610.00	2572.60	62.00		3171.80	2296.13	5467.93	875.67	2236.00	5813.20	30.00	
Dissolved C	Dissolved O	4		4.00					9.52	3.12	12.64	6.41	9.97	12.74	22.00	9.49	3.51	13.00	5.99	10.26	12.99	62.00		10.08	2.71	12.78	7.37	9.80	12.91	28.00	

SW2		LAB ID:		SW2 Upgraded Treated Effluent										SW2 2020 Treated Effluent							
ured / estimated flow		Sampled:		May 23, 2019 to December 9, 2020										2020-01-10 - 2020-12-09							
ent discharge (L/sec)		ample ID:		DD - EI										DD - EI							
Nearfield Effects Station												Water Quality Objective / Guideline									
Sample Date																					
Analyte	ARAMETE	PWQO	MRL	Post TLA Me	Standard De	+ve SD	-ve SD	Grp 4 Media	Grp 4 90th ?	N of samples > PWQO	No > MRL				Post TLA M	Standard D	+ve SD	-ve SD	Grp 4 Med	Grp 4 90th	N	
1,2-dichloroethane-d4 (%)															97.75	11.90	109.65	85.85	98.50	108.00	4.00	4.00
1,4-dichlorobenzene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!		0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
4-bromofluorobenzene (%)											7.00				101.00	8.04	109.04	92.96	103.50	107.00	4.00	4.00
Ag (mg/L)	Silver (mg/	0.0001	0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Al (dissolve	Al (dissolve	0.075*	0.01	0.13	0.09	0.22	0.04	0.12	0.24	6.00	15.00				0.15	0.10	0.25	0.05	0.13	0.27	10.00	10.00
Alkalinity as	Alkalinity as CaCO3 (m		5	249.61	89.19	338.80	160.43	255.00	370.00		31.00				219.07	93.63	312.70	125.44	208.50	341.50	14.00	14.00
As (mg/L)	Arsenic	0.1	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00	9.00	6.00
B (mg/L)	Boron (mg/	0.2*	0.01	2.53	1.84	4.37	0.69	2.09	5.05	0.00	31.00	1.20			2.27	1.89	4.17	0.38	1.98	4.49	14.00	14.00
Ba (mg/L)	Barium (mg/L)		0.01	0.13	0.08	0.21	0.05	0.10	0.21	7.00	31.00				0.14	0.11	0.24	0.03	0.09	0.26	14.00	14.00
Benzene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Ca (mg/L)	Calcium		1	86.59	19.57	106.16	67.01	91.15	107.30		30.00				82.55	19.47	102.02	63.08	74.50	104.60	14.00	14.00
CBOD5 (mg/	Biochemical Oxygen Den		1	5.67	1.53	7.19	4.14	6.00	6.80		3.00				5.67	1.53	7.19	4.14	6.00	6.80	3.00	3.00
Cd (mg/L)	Cadmium	0.0002	0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Cl (mg/L)	Chloride (mg/L)		1	391.15	285.41	676.55	105.74	329.00	780.00	7.00	31.00	120.00			318.96	237.21	556.18	81.75	270.50	637.80	14.00	14.00
Co (mg/L)	Cobalt	0.0009	0.0002	5.0275	20.0993	25.1269	-15.0718	0.0027	0.0054		16.00				0.0029	0.0017	0.0046	0.0012	0.0027	0.0049	10.0000	8.0000
COD (mg/L	Chemical Oxygen Dem		5	109.00	49.32	158.32	59.68	98.00	177.00		31.00				102.71	57.30	160.01	45.42	82.50	180.50	14.00	14.00
Conductivit	Conductivity (µS/cm)		5	2816.58	1690.69	4507.27	1125.89	2790.00	5230.00		31.00				2319.57	1601.88	3921.45	717.69	2025.00	4010.00	14.00	14.00
Cr (mg/L)	Chromium	0.0089**	0.001	0.006	0.003	0.010	0.003	0.006	0.011	0.00	30.00				0.006	0.004	0.010	0.002	0.004	0.013	13.000	13.000
Cu (mg/L)	Copper* (m	0.005	0.001	0.0037	0.0017	0.0054	0.0020	0.0035	0.0063	7.00	31.00	0.0020			0.0032	0.0011	0.0043	0.0022	0.0033	0.0047	14.0000	14.0000
Dichloromethane (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
DOC (mg/L	Dissolved Organic Carl		0.50	33.18	18.45	51.63	14.74	29.50	45.80		31.00				38.34	23.21	61.55	15.13	31.20	60.01	14.00	14.00
Fe (mg/L)	Iron* (mg/L	0.3	0.03	0.31	0.22	0.53	0.09	0.27	0.70	3.00	31.00	0.30			0.35	0.22	0.58	0.13	0.28	0.71	14.00	14.00
Filtration				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!		0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Hardness a	Hardness as CaCO3		1	424.55	126.84	551.39	297.70	411.00	618.30		22.00				404.90	132.61	537.51	272.29	388.00	604.70	10.00	10.00
Hg (mg/L)	Mercury	0.0002	0.0001	0.0001	0.0000	0.0001	0.0000	0.0001	0.0001	0.00	0.00				0.0001	#DIV/0!	#DIV/0!	#DIV/0!	0.0001	0.0001	1.0000	0.0000
K (mg/L)	Potassium (mg/L)		1	125.89	88.27	214.16	37.63	109.00	247.00		31.00				110.30	88.99	199.29	21.31	90.50	224.30	14.00	14.00
Mg (mg/L)	Magnesium (mg/L)		1	54.69	30.24	84.93	24.46	49.00	99.00		31.00				48.13	29.27	77.40	18.86	42.50	87.63	14.00	14.00
Mn (mg/L)	Manganese		0.01	0.03	0.02	0.05	0.01	0.03	0.06		26.00				0.04	0.02	0.06	0.02	0.03	0.07	14.00	14.00
Na (mg/L)	Sodium (mg/L)		2	410.18	291.50	701.68	118.68	345.00	836.00	6.00	31.00	180.00			348.26	264.29	612.55	83.96	311.00	623.20	14.00	14.00
N-NH3 (mg/	N-NH3 (Ammonia)* (mg/		0.02	0.51	0.54	1.06	-0.03	0.31	1.14		31.00				0.81	0.69	1.50	0.11	0.52	1.51	14.00	14.00
N-NH3 (Un	NH3 (un-io	0.02		0.0064	0.0107	0.0172	-0.0043	0.0023	0.0182	1.00	0.00				0.0096	0.0135	0.0230	-0.0039	0.0029	0.0202	12.0000	8.0000
N-NO2 (mg/	N-NO2 (Nitrite)		0.10	0.193	0.060	0.254	0.133	0.200	0.240	2.00	3.00				0.193	0.060	0.254	0.133	0.200	0.240	3.000	3.000
N-NO3 (mg/	N-NO3 (Nitrate) (mg/L)		0.10	121.06	95.30	216.36	25.76	92.55	256.50	7.00	30.00	3.00			120.19	107.29	227.49	12.90	84.85	249.30	14.00	14.00
P - Total (m	Total Phosp	0.03*	0.01	0.198	0.115	0.313	0.083	0.170	0.339	7.00	31.00	0.030			0.256	0.138	0.393	0.118	0.233	0.444	14.000	14.000
Pb (mg/L)	Lead	0.025	0.001	0.0003	0.0002	0.0005	0.0001	0.0002	0.0005	0.00	0.00				0.0004	0.0004	0.0008	0.0000	0.0003	0.0008	4.0000	0.0000
pH	pH (pH unit	6.5-8.5		8.16	0.19	8.35	7.96	8.19	8.39	6.00	15.00				8.10	0.18	8.28	7.92	8.06	8.32	10.00	10.00
Phenols (mg	Phenols* (m	0.001	0.001	0.0070	0.0043	0.0113	0.0027	0.0060	0.0126	3.00	9.00				0.0080	0.0043	0.0123	0.0037	0.0070	0.0132	7.0000	7.0000
Se (mg/L)	Selenium ((	0.1	0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
SO4 (mg/L)	Sulphate (mg/L)		1	265.68	190.69	456.37	74.99	215.00	606.00	7.00	31.00	429.00			172.93	65.86	238.79	107.07	199.00	233.90	14.00	14.00
TDS (CON	TDS (COND - CALC) (		5	1907.39	1232.88	3140.26	674.51	1770.00	3736.00	7.00	30.00				1524.29	1078.09	2602.37	446.20	1315.00	2819.40	14.00	14.00
Toluene (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Toluene-d8 (%)				100.29	5.68	105.96	94.61	102.00	105.80	2.00	7.00				100.75	6.85	107.60	93.90	102.50	105.80	4.00	4.00
Total Kjelda	Total Kjeldahl Nitrogen		0.10	173.39	921.24	1094.62	-747.85	4.66	9.28	7.00	30.00				366.39	1348.33	1714.71	-981.94	5.38	12.53	14.00	14.00
Total P - Soluble (mg/L)				0.13	0.07	0.20	0.06	0.12	0.19	6.00	15.00				0.13	0.08	0.22	0.05	0.12	0.21	10.00	10.00
Total Suspe	Total Suspended Solids	2		19.06	18.80	37.86	0.27	13.00	33.00	7.00	31.00				24.79	26.41	51.20	-1.63	15.00	51.40	14.00	14.00
Vinyl Chloride (µg/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00
Zn (mg/L)	Zinc* (mg/L	0.03	0.01	0.03	0.01	0.04	0.01	0.02	0.04	6.00	23.00				0.02	0.01	0.04	0.01	0.02	0.04	10.00	10.00
Chromium (mg/L)		0.01																				
Field Data	**Field Data**																					
Temperatu	Temperature (ºC)			11.72	8.18	19.90	3.54	10.15	21.26						7.09	7.25	14.34	-0.16	4.50	18.85	14.00	14.00
pH	pH (field) (p	6.5-8.5		7.90	0.57	8.47	7.32	7.95	8.42						7.61	0.64	8.25	6.96	7.45	8.48	14.00	14.00
Conductivit	Conductivity (field) (µS/cm)			1914.95	1176.43	3091.38	738.52	1893.50	2982.00						2195.92	1194.59	3390.51	1001.32	2071.00	2922.30	12.00	12.00
Dissolved C	Dissolved O	4		10.45	4.12	14.57	6.33	11.08	13.94						9.86	3.99	13.85	5.87	10.30	13.41	14.00	14.00

SWAF1						SWAF1 - All Data, Limited Samples								SWAF1 - 2020 AMR						
			Meets PWQO			May 23, 2019 to December 9, 2020								2020-01-10 to December 9, 2020						
			Exceeds PWQO																	
		Meets CCME or MOE BC long term guideline																		
		Exceeds CCME or MOE BC long term guideline																		
Estimated Flow (L/sec)																				
Discharge (L/sec)																				
lly signed PDF version of the report for official results.				PWQO (APV for Cl and Na)	CCME Surface Water	Environment BC Surface	Mean	Standard Deviation	Positive SD	Negative SD	Median	90th %	N	Mean	Standard Deviation	Positive SD	Negative SD	Median	90th %	N
Analyte	**Units**	**lytical Met**	**MRL**				Mean	dard Devia	Positive SD	Negative SD	Median	90th %	N	Mean	dard Devia	Positive SD	Negative SD	Median	90th %	N
chloroetha	%	EPA 8260	0.00				96.77	12.70	109.47	84.07	99.00	109.00	7.00	94.75	17.06	111.81	77.69	97.50	109.00	4.00
lichloroben	ug/L	EPA 8260	0.40	4.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
mofluorobe	%	EPA 8260	0.00				103.71	10.00	113.71	93.72	106.00	113.00	7.00	103.50	9.11	112.61	94.39	107.50	109.00	4.00
Ag	mg/L	EPA 200.8	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
l (dissolved	mg/L	EPA 200.8	0.01				0.15	0.27	0.42	-0.12	0.03	0.47	18.00	0.25	0.34	0.59	-0.09	0.06	0.84	10.00
linity as Ca	mg/L	20,2510,45	5.00				167.43	40.72	208.14	126.71	169.00	208.00	21.00	164.91	45.53	210.44	119.38	158.00	208.00	11.00
As	mg/L	EPA 200.8	0.00				0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00
B	mg/L	EPA 200.8	0.010	0.2*	29/1.5	ND/1.2	0.143	0.054	0.197	0.089	0.130	0.210	21.000	0.141	0.067	0.208	0.074	0.130	0.250	11.000
Ba	mg/L	EPA 200.8	0.01				0.03	0.01	0.04	0.02	0.03	0.04	21.00	0.03	0.01	0.04	0.01	0.02	0.03	11.00
Benzene	ug/L	EPA 8260	0.50	100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Ca	mg/L	M3120B-35	1.00				46.57	7.56	54.13	39.01	46.00	54.00	21.00	47.36	8.44	55.80	38.92	50.00	52.00	11.00
CBOD5	mg/L	SM 5210B	1.00				3.79	2.12	5.91	1.67	3.00	6.40	19.00	4.00	2.05	6.05	1.95	3.50	6.20	10.00
Cd	mg/L	EPA 200.8	0.0001	0.0002	001/.00009	calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.0000	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.0000
Cl	mg/L	SM 4110	1.00		640/120	600/150	5.33	2.15	7.49	3.18	5.00	8.00	21.00	4.73	1.56	6.28	3.17	4.00	7.00	11.00
Co	mg/L	EPA 200.8	0.0002			0.110/0.004	0.0007	0.0005	0.0012	0.0002	0.0005	0.0014	21.0000	0.0005	0.0004	0.0010	0.0001	0.0004	0.0007	11.0000
COD	mg/L	C SM5220D	5.00				66.90	42.40	109.31	24.50	53.00	84.00	21.00	76.45	57.49	133.95	18.96	52.00	101.00	11.00
Conductivit	uS/cm	C SM2510B	5.00				372.57	75.10	447.67	297.48	386.00	448.00	21.00	365.45	73.64	439.10	291.81	386.00	448.00	11.00
Cr	mg/L	EPA 200.8	0.0010	0.0089	ND/.001		0.0028	0.0017	0.0046	0.0011	0.0020	0.0060	19.0000	0.0023	0.0015	0.0038	0.0008	0.0020	0.0036	9.0000
Cu	mg/L	EPA 200.8	0.0010		ND/.004	.029/≤0.00	0.0028	0.0019	0.0047	0.0008	0.0020	0.0042	20.0000	0.0024	0.0024	0.0048	0.0000	0.0020	0.0036	10.0000
hloromethа	ug/L	EPA 8260	4.00	100.00	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
DOC	mg/L	NTRACT-E-	0.50				23.11	4.74	27.85	18.38	22.00	30.40	21.00	23.11	5.88	28.99	17.23	22.20	30.40	11.00
Fe	mg/L	EPA 200.8	0.030	0.300	ND/0.3	0.001/ND	1.084	0.725	1.810	0.359	0.800	2.110	21.000	0.895	0.721	1.616	0.173	0.690	1.210	11.000
Filtration		EPA 200.8					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
dness as Ca	mg/L	C SM2340B	1.00				154.81	27.23	182.04	127.58	156.00	183.00	21.00	156.18	30.44	186.62	125.74	166.00	174.00	11.00
Hg	mg/L	EPA 200.8	0.00	0.00	ND/.000020	D/calculatio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
K	mg/L	M3120B-35	1.00				3.00	1.18	4.18	1.82	3.00	4.00	21.00	2.82	1.17	3.99	1.65	3.00	4.00	11.00
Mg	mg/L	M3120B-35	1.00				9.33	2.22	11.55	7.11	10.00	12.00	21.00	9.18	2.44	11.62	6.74	10.00	12.00	11.00
Mn	mg/L	EPA 200.8	0.01				0.09	0.07	0.17	0.02	0.06	0.23	21.00	0.08	0.07	0.14	0.01	0.05	0.14	11.00
Na	mg/L	M3120B-35	2.00	180.00			23.90	8.28	32.19	15.62	22.00	29.00	21.00	22.00	6.43	28.43	15.57	22.00	28.00	11.00
N-NH3	mg/L	BCONTRAC	0.01				0.36	0.32	0.68	0.04	0.21	0.96	19.00	0.37	0.33	0.70	0.04	0.27	0.76	9.00
n-ionized ammonia)				0.020			0.013	0.014	0.026	-0.001	0.007	0.035	15.000	0.013	0.014	0.026	-0.001	0.007	0.028	9.000
N-NO2	mg/L	SM 4110	0.10			0.6/0.2	0.11	#DIV/0!	#DIV/0!	#DIV/0!	0.11	0.11	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
N-NO3	mg/L	SM 4110	0.10		124/3.0	32.8/3.0	1.17	0.83	2.00	0.34	1.09	2.24	19.00	1.14	0.74	1.88	0.40	1.09	2.01	9.00
P - Total	mg/L	EPA 200.8	0.002	0.030			0.124	0.082	0.206	0.042	0.101	0.226	21.000	0.092	0.076	0.168	0.016	0.064	0.131	11.000
Pb	mg/L	EPA 200.8	0.001	0.025	ND/.007	0.003/ND	0.003	0.001	0.003	0.002	0.003	0.003	2.000	0.003	#DIV/0!	#DIV/0!	#DIV/0!	0.003	0.003	1.000
pH		SM2320,2510,45	1.00				8.02	0.22	8.25	7.80	8.03	8.28	21.00	7.96	0.16	8.13	7.80	7.98	8.13	11.00
Phenols	mg/L	BCONTRAC	0.0010	0.0010	ND/0.004	.050/ND	0.0043	0.0014	0.0057	0.0030	0.0045	0.0055	6.0000	0.0044	0.0015	0.0059	0.0029	0.0050	0.0056	5.0000
Se	mg/L	EPA 200.8	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
SO4	mg/L	SM 4110	1.00			429.00	24.10	14.13	38.22	9.97	21.00	43.00	21.00	24.18	10.93	35.11	13.26	21.00	43.00	11.00
(COND - CA	mg/L	C SM2540	1.00				242.10	48.78	290.88	193.31	251.00	291.00	21.00	237.36	47.86	285.22	189.51	251.00	291.00	11.00
Toluene	ug/L	EPA 8260	0.50	0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Toluene-d8	%	EPA 8260	0.00				100.14	6.49	106.63	93.65	101.00	107.20	7.00	101.75	7.89	109.64	93.86	103.50	108.10	4.00
Kjeldahl Nit	mg/L	BCONTRAC	0.15				1.97	1.03	3.00	0.94	1.79	2.65	21.00	2.24	1.36	3.60	0.88	1.81	2.67	11.00
tal P - Solu	mg/L	EPA 200.8	0.00				0.06	0.03	0.09	0.02	0.06	0.10	21.00	0.04	0.02	0.06	0.02	0.04	0.06	11.00
Suspended	mg/L	C SM2540	2.00				89.57	124.78	214.35	-35.21	32.00	283.00	21.00	89.64	141.90	231.54	-52.27	23.00	283.00	11.00
inyl Chlorid	ug/L	EPA 8260	0.20	600.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zn	mg/L	EPA 200.8	0.01	0.03	.037/.007	.033/0.007	0.01	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.01	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Field Data																				
Temperature							12.18	9.74	21.92	2.44	9.70	24.37	23.00	7.30	8.13	15.43	-0.83	3.50	19.70	11.00
pH							8.19	0.78	8.97	7.42	8.38	8.86	22.00	8.18	1.05	9.23	7.13	8.40	8.93	11.00
Conductivity							378.63	69.80	448.43	308.82	384.00	441.30	22.00	377.45	68.55	446.00	308.91	390.00	442.00	11.00
ved Oxygen (mg/L)							23.25	72.18	95.42	-48.93	6.67	12.41	22.00	42.04	106.90	148.93	-64.86	7.87	50.32	10.00

SWFD2

LAB ID:
Flow (L/sec)
Sample ID:
Station
Date

Meets PWQO
Exceeds PWQO
Meets CCME or MOE BC I
Exceeds CCME or MOE BC

SW2-3A / SWFD2 Grp. A
1996-7-12 to 2019-5-08

SW2-3A / SWFD2 Grp. B
2019-5-23 to 2020-12-09

SW2-3A / SWFD2 AMR 2020
2020-01-10 to 2020-12-09

Analyte	ARAMETE	PWQO	MRL	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)	SW2-3A MEAN	Standard Deviation	+ve SD	-ve SD	Median	90th %	N above DL	SW2-3A MEAN	Standard Deviation	+ve SD	-ve SD	Median	90th %	N above DL	SW2-3A M	Standard D	+ve SD	-ve SD	Median	90th %	N above DL
1,2-dichloroethane-d4 (%)																					98	10.14889	108.1489	87.85111	100	105.6	3
1,4-dichlorobenzene (µg/L)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
4-bromofluorobenzene (%)				4																	101.3333	10.01665	111.35	91.31668	105	108.2	3
Ag (mg/L)	Silver	0.0001	0.0001				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Al (dissolve	Al (dissolve	0.075*	0.01				0.0368	0.0260	0.0629	0.0108	0.0300	0.0600	41	0.0983	0.1575	0.2559	-0.0592	0.0200	0.2770	12	0.126667	0.174642	0.301309	-0.04798	0.03	0.336	9
Alkalinity a	Alkalinity as CaCO3		5				178.1860	43.7086	221.8946	134.4775	170.0000	214.0000	43	177.7500	37.0018	214.7518	140.7482	176.0000	217.5000	16	170.2	38.69482	208.8948	131.5052	173	216.3	10
As (mg/L)	Arsenic	0.1	0.001				0.0010	#DIV/0!	#DIV/0!	#DIV/0!	0.0010	0.0010	1	0.0015	0.0008	0.0023	0.0007	0.0010	0.0025	6	0.00125	0.0005	0.00175	0.00075	0.001	0.0017	4
B (mg/L)	Boron	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.0547	0.0394	0.0940	0.0153	0.0400	0.1000	43	0.1033	0.0542	0.1575	0.0491	0.0800	0.1960	15	0.092222	0.044096	0.136318	0.048126	0.07	0.15	9
Ba (mg/L)	Barium		0.01				0.0398	0.0083	0.0481	0.0315	0.0400	0.0500	43	0.0493	0.0100	0.0593	0.0393	0.0500	0.0600	14	0.05	0.01118	0.06118	0.03882	0.05	0.062	9
Benzene (µg/L)				100	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Ca (mg/L)	Calcium		1				72.9524	18.6978	91.6502	54.2546	70.0000	90.9000	42	82.9375	14.1961	97.1336	68.7414	82.5000	96.5000	16	80.5	16.78789	97.28789	63.71211	77	98.1	10
CBOD5 (m	Biochemical Oxygen D		1				2.2333	1.7157	3.9490	0.5176	2.0000	6.0000	30	4.0000	2.2532	6.2532	1.7468	3.0000	7.0000	14	4.111111	2.315407	6.426518	1.795704	3	7	9
Cd (mg/L)	Cadmium	0.0002	0.0001	0.0002	.001/.0000	calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Cl (mg/L)	Chloride		1		640/120	600/150	22.3256	17.9718	40.2974	4.3538	17.0000	33.4000	43	30.8750	11.1288	42.0038	19.7462	29.5000	38.0000	16	27.9	7.35527	35.25527	20.54473	26	36.4	10
Co (mg/L)	Cobalt	0.0009	0.0002			0.110/0.004	0.0003	0.0002	0.0005	0.0002	0.0003	0.0005	31	0.0009	0.0017	0.0026	-0.0008	0.0003	0.0009	11	0.000414	0.000248	0.000662	0.000166	0.0003	0.00072	7
COD (mg/L	Chemical Oxygen Den		5				47.2791	13.8776	61.1566	33.4015	48.0000	63.0000	43	74.1250	107.3815	181.5065	-33.2565	45.5000	87.5000	16	84.6	135.9577	220.5577	-51.3577	42	96.6	10
Conductivit	Conductivity (µS/cm)		5				490.9302	176.6846	667.6148	314.2456	453.0000	589.0000	43	575.8125	113.3180	689.1305	462.4945	593.0000	674.0000	16	569.6	129.2777	698.8777	440.3223	546.5	689.9	10
Cr (mg/L)	Chromium	0.0089**	0.001	0.0089	ND/.001		0.0026	0.0021	0.0047	0.0004	0.0020	0.0050	29	0.0026	0.0031	0.0057	-0.0004	0.0015	0.0051	8	0.0016	0.000894	0.002494	0.000706	0.001	0.0026	5
Cu (mg/L)	Copper	0.005	0.001		ND/.004	0.029/≤0.002	0.002	0.001	0.003	0.001	0.002	0.003	39.000	0.004	0.005	0.009	-0.001	0.002	0.006	14.000	0.003	0.002	0.004	0.001	0.002	0.005	9.000
Dichloromethane (µg/L)				100	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
DOC (mg/L	Dissolved Organic Car		0.5				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	17.9563	5.4160	23.3723	12.5402	16.2500	21.3500	16	16.61	2.935775	19.54578	13.67422	15.5	20.07	10
Fe (mg/L)	Iron	0.3	0.03	0.3	ND/0.3	0.001/ND	0.5665	0.4797	1.0462	0.0868	0.4100	1.1840	43	0.8950	1.5365	2.4315	-0.6415	0.3700	1.5250	16	0.622	0.524993	1.146993	0.097007	0.41	1.305	10
Filtration							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Hardness a	Hardness as CaCO3		1				226.9048	72.4370	299.3417	154.4678	213.5000	277.9000	42	255.1250	45.7805	300.9055	209.3445	254.0000	306.0000	16	248.4	54.15246	302.5525	194.2475	237.5	312.6	10
Hg (mg/L)	Mercury	0.0002	0.0001	0.0002	ND/.00002	ND/calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
K (mg/L)	Potassium		1				2.5714	1.7128	4.2843	0.8586	2.0000	4.0000	42	5.1875	3.5065	8.6940	1.6810	4.0000	10.5000	16	5.6	4.247875	9.847875	1.352125	3.5	12.1	10
Mg (mg/L)	Magnesium		1				10.8571	6.9267	17.7838	3.9304	9.0000	13.9000	42	11.6875	2.8218	14.5093	8.8657	12.0000	14.5000	16	11.5	3.341656	14.84166	8.158344	11	14.4	10
Mn (mg/L)	Manganese		0.005				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	0.1175	0.1626	0.2801	-0.0451	0.0550	0.3100	16	0.076	0.115585	0.191585	-0.03959	0.04	0.112	10
Na (mg/L)	Sodium		2	180			19.6667	17.6934	37.3601	1.9733	14.0000	37.9000	42	23.0000	8.6410	31.6410	14.3590	19.0000	32.0000	16	22.4	9.97998	32.37998	12.42002	19	29.2	10
N-NH3 (m	N-NH3 (Ammonia)		0.02				0.3138	0.5884	0.9021	-0.2746	0.1150	0.5400	40	0.2986	0.2745	0.5731	0.0241	0.1820	0.7342	13	0.3055	0.272262	0.577762	0.033238	0.2385	0.5479	8
N-NH3 (Un	NH3 (un-io	0.02		0.02000			0.01542	0.05510	0.07052	-0.03969	0.00118	0.02135	40.00000	0.01271	0.01329	0.02600	-0.00058	0.00649	0.02722	10.00000	0.01338	0.01463	0.02801	-0.00125	0.00649	0.03066	8.00000
N-NO2 (m	N-NO2 (Nitrite)		0.10			0.6/0.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
N-NO3 (m	N-NO3 (Nitrate)		0.10		124/3.0	32.8/3.0	1.6977	1.6836	3.3813	0.0141	1.0800	3.9040	39	3.1313	2.1255	5.2568	1.0059	2.3500	6.4180	15	3.101	1.978386	5.079386	1.122614	2.495	5.489	10
P - Total (r	Total Phos	0.03*	0.01	0.030			0.139	0.101	0.240	0.038	0.110	0.294	43.000	0.394	0.420	0.814	-0.026	0.249	0.855	16.000	0.281	0.221	0.501	0.060	0.249	0.602	10.000
Pb (mg/L)	Lead	0.025	0.001	0.025	ND/.007	0.003/ND	0.0020	0.0000	0.0020	0.0020	0.0020	0.0020	5	0.0107	0.0167	0.0274	-0.0061	0.0010	0.0242	3	0.001	#DIV/0!	#DIV/0!	#DIV/0!	0.001	0.001	1
pH	pH (pH uni	6.5-8.5					8.1202	0.1913	8.3116	7.9289	8.0900	8.3500	43	8.0550	0.2291	8.2841	7.8259	8.0400	8.3400	16	8.048	0.21301	8.26101	7.83499	8.04	8.3	10
Phenols (m	Phenols	0.001	0.001	0.001	ND/0.004	.050/ND	0.0015	0.0007	0.0022	0.0008	0.0015	0.0019	2	0.0058	0.0008	0.0066	0.0050	0.0060	0.0066	5	0.00575	0.000957	0.006707	0.004793	0.0055	0.0067	4
Se (mg/L)	Selenium	0.1	0.001				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
SO4 (mg/L	Sulphate		1			429	41.8372	42.0158	83.8530	-0.1786	32.0000	59.0000	43	71.3750	30.9384	102.3134	40.4366	63.0000	96.0000	16	76.1	34.94265	111.0427	41.15735	68	101.7	10
TDS (CON	TDS (COND - CALC)		5				319.1163	114.8455	433.9618	204.2708	294.0000	383.2000	43	374.2500	73.7523	448.0023	300.4977	385.0000	438.0000	16	370.2	84.17416	454.3742	286.0258	355	448.1	10
Toluene (µg/L)				0.8	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Toluene-d8 (%)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	99.6000	4.9295	104.5295	94.6705	101.0000	103.8000	5	99.66667	6.806859	106.4735	92.85981	102	104.4	3
Total Kjeld	Total Kjeldahl Nitroger	0.10					1.2784	0.7396	2.0180	0.5387	1.1100	1.9040	43	2.7243	2.8549	5.5792	-0.1306	1.7950	5.7050	16	2.6899	3.103303	5.793203	-0.4134	1.765	4.019	10
Total P - Soluble (mg/L)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	0.2513	0.3802	0.6315	-0.1290	0.1490	0.3980	16	0.1712	0.139588	0.310788	0.031612	0.162	0.3252	10
Total Susp	Total Suspended Solic		2				18.0732	16.9402	35.0133	1.1330	12.0000	39.0000	41	165.4375	449.0801	614.5176	-283.6426	16.5000	288.5000	16	207.2	556.9494	764.1494	-349.749	20	258.2	10
Vinyl Chloride (µg/L)				600			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Zn (mg/L)	Zinc	0.03	0.01	0.03	.037/.007	0.033/0.0075	0.0200	#DIV/0!	#DIV/0!	#DIV/0!	0.0200	0.0200	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Field Data	**Field Data:**																										
Temperatu	Temperature (ºC)						10.9907	8.3415	19.3322	2.6492	14.5000	21.0000	43	10.6341	8.1073	18.7414	2.5268	9.3000	20.5880	17	8.725	7.408382	16.13338	1.316618	8.2	19.528	10
pH	pH (field) (	6.5-8.5					7.9037	0.4768	8.3804	7.4269	8.0000	8.4300	41	8.2553	0.3427	8.5980	7.9126	8.2400	8.6800	17	8.294	0.414788	8.708788	7.879212	8.28	8.703	10
Conductivit	Conductivity (field) (µS/cm)						516.7073	149.4264	666.1338	367.2809	481.0000	708.0000	41	553.4706	106.3468	659.8174	447.1238	563.0000	667.4000	17	545	122.0783	667.0783	422.9217	546.5	641.3	10
Dissolved (	Dissolved Oxygen						10.4534	3.7360	14.1894	6.7174	11.3100	14.2300	41	11.7144	4.9487	16.6631	6.7657	11.8400	16.8850	16	11.305	5.680814	16.98581	5.624186	11.41	17.153	10

SWFD3	background site not subjected to landfill so all data		Regulated		Meets PWQO	Statistics - Grp A - Upstream of Discharge - Background Prior to May 23, 2019								Statistics - Grp. B Upstream of Discharge - Background from May 23, 2019								Statistics - AMR 2020						
		Sampled:		Effluent	Exceeds PWQO	1996-12-07 to May 8, 2019								May 23, 2019 to December 9, 2020								May 23, 2019 to December 9, 2020						
		ample ID:		Parameter	Meets CCME or MOE									DB to EK								DB to EK						
				mg/L	Exceeds CCME or M																							
																						Water Quality Objective / Guideline						
	Sample Date				PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)																						
Analyte	ARAMETE	PWQO	MRL					MEAN	Standard Deviation	+ SD	- SD	Grp. A Median	Grp. A 90th %	N		MEAN	Standard Deviation	+ SD	- SD	Grp. B Median	Grp. B 90th %	N		MEAN	Standard De	+ SD	- SD	Grp. B Med	Grp. B 90th	N
1,2-dichloroethane-d4 (%)																								98	11.661904	11.661904	86.338096	97	108.8	4
1,4-dichlorobenzene (µg/L)					4			4.0000	#DIV/0!	#DIV/0!	#DIV/0!	4.0000	4.000	1900-01-01		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
4-bromofluorobenzene (%)																								100.25	7.804913	7.804913	92.445087	103	105.7	4
Ag (mg/L)	Silver	0.0001	0.0001					0.0100	#DIV/0!	#DIV/0!	#DIV/0!	0.0100	0.010	1		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
Al (dissolved)	Al (dissolved)	0.075*	0.01					0.0343	0.022	0.0566	0.0119	0.0300	0.060	54		0.04	0.05	0.05	-0.01	0.02	0.09	15		0.0555556	0.0663534	0.0863534	-0.010798	0.02	0.114	9
Alkalinity as C	Alkalinity as CaCO3		5					159.4045	30.424	189.8287	128.9803	158.0000	204.000	89		163	53	212	110	157	187	35		145.38462	24.831225	181.83123	120.55339	145	170.8	13
As (mg/L)	Arsenic	0.1	0.001					0.0030	#DIV/0!	#DIV/0!	#DIV/0!	0.0030	0.003	1		0.001	0.000	0.000	0.001	0.001	0.001	3		0.001	0	#VALUE!	0.001	0.001	0.001	2
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.039	0.042	0.080	-0.003	0.030	0.067	70.000		0.042	0.038	0.055	0.004	0.030	0.072	35.000	1.200	0.037	0.026	0.066	0.012	0.030	0.064	13.000
Ba (mg/L)	Barium		0.01					0.2575	1.896	2.1531	-1.6382	0.0400	0.060	80		0.05	0.02	0.08	0.03	0.05	0.07	35		0.0451538	0.0094855	0.0594855	0.0356684	0.044	0.058	13
Benzene (µg/L)					100	ND/370	ND/40	100.0000	#DIV/0!	#DIV/0!	#DIV/0!	100.0000	100.000	1		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Ca (mg/L)	Calcium		1					865.1926	6539.727	7404.9201	-5674.5348	71.5000	88.900	68		83	30	101	53	76	92	35		73.684615	10.944622	95.944622	62.739994	73	87.98	13
CBOD5 (mg/	Biochemical Oxygen Demand (mg/L)		1	10.0				2.0789	1.617	3.6961	0.4618	2.0000	3.300	38		5	3	#VALUE!	2	4	8	19		5	2.792848	5.792848	2.207152	4	9	11
Cd (mg/L)	Cadmium	0.0002	0.0001		0.0002	.001/.00005	calculation	0.0063	0.018	0.0240	-0.0113	0.0001	0.015	8		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
Cl (mg/L)	Chloride		1			640/120	600/150	23.6	17.9	41.5	5.6	18.0	41.1	90.0		49.0	82.1	116.1	-33.1	30.0	47.4	35.0	120.0	27.2	8.4	34.4	18.8	25.3	39.0	13.0
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	0.0003	0.000	0.0008	-0.0001	0.0002	0.000	29		0.0004	0.0002	0.0002	0.0002	0.0003	0.0006	8		0.00042	0.0002387	#VALUE!	0.0001813	0.0003	0.00068	5
COD (mg/L)	Chemical Oxygen Demand		5					43.8652	20.379	64.2446	23.4857	39.0000	63.200	89		38	11	35	27	37	53	35		37.923077	10.152681	45.152681	27.770396	34	52.2	13
Conductivity	Conductivity (µS/cm)		5					454.9118	109.675	564.5864	345.2371	443.5000	541.500	68		564	282	789	282	524	583	35		484.46154	78.092483	621.09248	406.36906	470	580	13
Cr (mg/L)	Chromium (total)	0.0089**	0.001		0.0089	ND/.001		195.5399	255.758	451.2977	-60.2178	0.0040	560.800	52		0.002	0.001	#VALUE!	0.001	0.002	0.002	13		0.0015714	0.0005345	#VALUE!	0.0010369	0.002	0.002	7
Cu (mg/L)	Copper (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.00	0.0027	0.0035	0.0062	-0.0008	0.0020	0.0058	72.0000		0.0021	0.0010	0.0016	0.0012	0.0020	0.0031	35.0000	0.0020	0.0022	0.0012	0.0032	0.0011	0.0020	0.0038	13.0000
Dichloromethane (µg/L)					100	ND/9811		100.0000	#DIV/0!	#DIV/0!	#DIV/0!	100.0000	100.000	1		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
DOC (mg/L)	Dissolved Organic Carbon		0.5					16.8130	4.937	21.7502	11.8759	15.4000	22.140	23		14	2	14	12	15	18	35		14.476923	2.8193243	18.119324	11.657599	12.8	19.04	13
Fe (mg/L)	Iron (mg/L)	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.595	1.151	1.747	-0.556	0.340	0.920	91.000		0.351	0.304	0.419	0.048	0.260	0.807	35.000	0.300	0.433	0.312	0.482	0.122	0.350	0.792	13.000
Filtration								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
Hardness as	Hardness as CaCO3		1					217.0851	35.299	252.3837	181.7865	214.0000	262.200	47		247	66	284	181	232	271	27		220	30.612271	283.61227	189.38773	215.5	265.3	10
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.00002	ND/calculat	0.0002	0.000	0.0007	-0.0002	0.0001	0.000	9		0.0000	0.0000	#VALUE!	0.0000	0.0000	0.0000	7		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
K (mg/L)	Potassium		1					60.9523	471.027	531.9790	-410.0744	2.0000	6.000	65		3	2	8	1	3	5	35		2.0076923	1.128023	3.128023	0.8796693	1.7	3	13
Mg (mg/L)	Magnesium		1					111.7187	841.484	953.2026	-729.7652	9.0000	13.600	69		11	6	16	5	10	11	35		8.5576923	1.6725736	11.672574	6.8851187	9	10.64	13
Mn (mg/L)	Manganese		0.005					0.1017	0.109	0.2108	-0.0074	0.0595	0.258	22		0.070	0.122	0.126	-0.051	0.030	0.181	32		0.0528333	0.0595877	0.0795877	-0.006754	0.0315	0.0794	12
Na (mg/L)	Sodium		2		180			17.1386	21.754	38.8926	-4.6154	12.2500	27.940	70		24	27	43	-3	17	30	35	180	15.984615	6.6685638	19.668564	9.3160516	13	26.8	13
N-NH3 (mg/L)	N-NH3 (Ammonia) (mg/L)		0.02	1.0				0.161	0.395	0.556	-0.234	0.090	0.252	79.000		0.110	0.209	0.239	-0.099	0.050	0.152	29.000	NA	0.082	0.039	#VALUE!	0.043	0.075	0.134	9.000
N-NH3 (Unic	NH3 (un-ionized Ammonia^)	0.02			0.0200			0.0049	0.012	0.0172	-0.0075	0.0016	0.010	77		0.0030	0.0054	0.0060	-0.0024	0.0008	0.0118	17	0	0.0049742	0.007565	#VALUE!	-0.002591	0.000956	0.0155227	7
N-NO2 (mg/L	N-NO2 (Nitrite)		0.10				0.6/0.2	0.2025	0.156	0.3588	0.0462	0.1400	0.355	4		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	1.9754	2.451	4.4260	-0.4752	0.9700	4.472	87		2.73	2.20	3.00	0.53	1.99	4.89	31	3	3.1391667	2.3526714	7.2426714	0.7864952	2.515	5.609	12
P - Total (mg/L	Total Phosphorus (mg/L)	0.03*	0.01	0.3	0.030			0.111	0.215	0.326	-0.104	0.050	0.225	86.000	52.000	0.077	0.050	#VALUE!	0.027	0.068	0.155	34.000	0.030	0.082	0.054	0.138	0.028	0.080	0.161	13.000
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	0.0126	0.037	0.0497	-0.0246	0.0014	0.017	16		0.000	0.000	#VALUE!	0.000	0.000	0.000	9		0.0002	0.0001414	#VALUE!	5.858E-05	0.0002	0.00028	2
pH	pH (pH units)	6.5-8.5						8.0313	0.365	8.3963	7.6664	8.0150	8.545	68		8.08	0.22	0.22	7.86	8.09	8.33	20		8.024	0.1581982	8.1181982	7.8658018	7.975	8.211	10
Phenols (mg/	Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.6805	2.349	3.0296	-1.6686	0.0025	0.005	12		0.004	0.001	#VALUE!	0.003	0.004	0.005	7		0.0041667	0.001472	#VALUE!	0.0026947	0.0045	0.0055	6
Se (mg/L)	Selenium	0.1	0.001					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0
SO4 (mg/L)	Sulphate		1				429	46.0550	49.409	95.4640	-3.3540	34.0000	80.000	91		52	16	73	36	55	73	34	429	50.846154	15.263498	92.263498	35.582656	54	68.4	13
TDS (COND	TDS (COND - CALC)		5					295.7444	70.050	365.7948	225.6941	290.5000	365.200	90		338	163	462	175	322	357	34		306.92308	53.076143	406.07614	253.84693	306	369.4	13
Toluene (µg/L)					0.8	ND/.002	ND/0.0005	0.8000	#DIV/0!	#DIV/0!	#DIV/0!	0.8000	0.800	1		1	#DIV/0!	#VALUE!	#DIV/0!	1	1	1		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Toluene-d8 (%)								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		100	6	6	93	102	106	7		101.25	7.8898669	7.8898669	93.360133	103.5	107.1	4
Total Kjeldah	Total Kjeldahl Nitrogen		0.10					5.1764	33.025	38.2017	-27.8488	0.9900	2.130	90		1.13	0.48	0.98	0.65	1.00	1.61	35		1.2955385	0.5379603	1.4379603	0.7575782	1.09	1.812	13
Total P - Soluble	(mg/L)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		0.04275	0.0269909	0.0269909	0.0157591	0.033	0.08103	18		0.0407	0.0315493	0.0965493	0.0091507	0.03	0.09264	9
Total Suspen	Total Suspended Solids (mg/L)		2	10.0				26.1161	61.877	87.9928	-35.7607	7.0000	40.000	79		22	38	#VALUE!	-16	11	46	30		23.333333	26.203169	32.203169	-2.869836	14	60.2	12
Vinyl Chloride (µg/L)					600			600.0000	#DIV/0!	#DIV/0!	#DIV/0!	600.0000	600.000	1		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Zn (mg/L)	Zinc (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.00	0.0282	0.017	0.0455	0.0108	0.0265	0.053	20		0.01	0.00	0.02	0.00	0.01	0.01	12		0.0063333	0.0015275	#VALUE!	0.0048058	0.006	0.0076	3
Chromium (mg/L)		0.0089																												
Field Data	**Field Data:**																													
Temperature	Temperature (°C)							10.8131	5.290	16.1032	5.5230	11.4750	15.597	84		11.74	7.71	15.01	4.04	10.00	20.84	35		7.5775	8.4628516	8.6728516	-0.885352	4.5	20.4	12
pH	pH (field) (pH units)	6.5-8.5						11.1794	9.482	20.6617	1.6971	8.0000	24.790	88		7.7	0.7	8.1	7.0	7.7	8.7	35		7.9092308	0.8675969	9.1875969	7.0416339	7.91	8.852	13
Conductivity	Conductivity (field) (µS/cm)							130.5008	211.210	341.7108	-80.7091	8.1200	499.200	84		483.56	117.12	117.12	366.44	517.00	579.20	23		467.61538	142.24482	674.24482	325.37056	509	578.2	13
Dissolved Ox	Dissolved Oxygen (mg/L)			4				380.1321	246.111	626.2428	134.0214	429.5000	649.000	86		10	5	5	5	10	15	23		10.513077	3.3761106	#VALUE!	7.1369663	10.91	13.932	13

SWFD4		LAB ID:		Reglated		Meets PWQO	Statistics - Group A Upstream Background								Statistics Grp B Upstream Background								SWFD4 AMR 2020 Summary						
		Estimated Stream Flow (L/sec)		Effluent		**Exceeds PWQO**	1996-07-12 to 2019-5-8								**2019-5-23 to 2020-12-09**														
		Sample ID:		Parameter		**Meets CCME or MOE BC long term guideline**									CR to DC								CG to DC						
				mg/L		Exceeds CCME or MOE BC long term guideline																								
Sample Date																													
Analyte	ARAMETER	PWQO	MRL		**PWQO (APV for Cl and Na)**	**CCME Surface Water Quality Guideline - Short/Long Term (mg/L)**	**Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)**	MEAN	Standard Deviation	+ SD	- SD	Median	90th %	N	MEAN	Standard Deviation	+ SD	- SD	Median	90th %	N	MEAN	dard Devia	+ SD	- SD	Median	90th %	N
												Grp A	Grp A						Grp B	Grp B							Grp B	Grp B	
loroethane-d4 (%)															100.00	7.91	-92.09	92.09	100.00	108.50	4.00								
lorobenzene (µg/L)					4			4.00	0.00	-4.00	4.00	4.00	4.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		1.86	3.06	3.06	-3.06	4.00	4.00	4.00
fluorobenzene (%)								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	100.50	6.34	-94.16	94.16	103.00	105.70	4.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.00
Ag (mg/L)	Silver	0.0001	0.0001					12.00	0.00	-12.00	12.00	12.00	12.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		5.29	9.17	9.17	-9.17	12.00	12.00	4.00
ssolved) (n	l (dissolved)	0.075*	0.01					0.03	0.02	-0.01	0.01	0.02	0.06	52.00	0.04	0.03	-0.01	0.01	0.02	0.07	11.00		2.51	0.03	0.03	-0.03	0.02	0.07	19.00
as CaCO	linity as CaCO3		5					147.26	28.10	-119.16	119.16	150.50	176.50	66.00	156.58	21.51	-135.08	135.08	158.50	179.70	12.00		130.52	64.46	64.46	-64.46	148.88	176.95	21.00
As (mg/L)	Arsenic	0.1	0.001					0.03	0.03	0.00	0.00	0.03	0.05	2.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		0.31	0.02	0.02	-0.02	0.03	0.04	5.00
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.013	0.005	-0.009	0.009	0.010	0.020	38.000	0.018	0.004	-0.015	0.015	0.020	0.020	12.000		1.741	0.007	0.007	-0.007	0.020	0.020	21.000
Ba (mg/L)	Barium		0.01					0.06	0.12	0.06	-0.06	0.05	0.06	58.00	0.06	0.02	-0.04	0.04	0.05	0.08	12.00		2.69	0.03	0.03	-0.03	0.05	0.08	21.00
enzene (µg/L)					100	ND/370	ND/40	100.00	0.00	-100.00	100.00	100.00	100.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		43.00	76.38	76.38	-76.38	100.00	100.00	4.00
Ca (mg/L)	Calcium		1					67.88	12.68	-55.20	55.20	67.00	81.00	48.00	74.58	11.03	-63.56	63.56	76.50	87.00	12.00		64.12	31.04	31.04	-31.04	74.00	87.00	21.00
BOD5 (mg	ical Oxygen Demand		1	10.0				1.48	0.71	-0.77	0.77	1.00	2.00	23.00	3.92	1.55	-2.36	2.36	3.50	6.00	12.00		3.96	1.90	1.90	-1.90	3.00	6.00	20.00
Cd (mg/L)	Cadmium	0.0002*	0.0001		0.0002	.001/.0000	calculation	28.33	40.07	11.74	-11.74	0.00	68.00	3.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		19.91	26.48	26.48	-26.48	20.03	54.03	5.00
Cl (mg/L)	Chloride		1			640/120	600/150	20.262	8.232	-12.030	12.030	18.000	32.400	65.000	26.000	7.286	-18.714	18.714	24.000	37.000	11.000		24.566	11.168	11.168	-11.168	24.000	34.000	20.000
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.00	26.9002	117.2543	90.3541	-90.3541	0.0002	0.0003	20.0000	0.0004	0.0001	-0.0002	0.0002	0.0004	0.0005	3.0000		16.4156	56.2642	56.2642	-56.2642	0.0004	95.7341	8.0000
COD (mg/L	al Oxygen Demand		5					31.48	8.81	-22.67	22.67	31.00	41.00	66.00	30.25	4.57	-25.68	25.68	29.00	36.70	12.00		29.24	13.10	13.10	-13.10	29.00	40.60	21.00
ctivity (µm	ductivity (µS/cm)		5					436.73	64.61	-372.12	372.12	434.00	531.40	63.00	476.33	69.37	-406.96	406.96	508.00	545.20	12.00		400.67	202.98	202.98	-202.98	501.50	545.20	21.00
Cr (mg/L)	romium (total)	0.0089**	0.001		0.0089	ND/.001		0.00	0.00	0.00	0.00	0.00	0.00	18.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00		2.00	0.00	0.00	0.00	0.00	0.00	7.00
Cu (mg/L)	Copper	0.005	0.001	0.2		ND/.004	0.029/≤0.0	0.0012	0.0004	-0.0008	0.0008	0.0010	0.0020	33.0000	0.0017	0.0014	-0.0003	0.0003	0.0010	0.0032	7.0000		1.9423	0.0011	0.0011	-0.0011	0.0010	0.0020	15.0000
romethane (µg/L)					100	ND/9811		100.00	0.00	-100.00	100.00	100.00	100.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		43.00	76.38	76.38	-76.38	100.00	100.00	4.00
DOC (mg/L	ed Organic Carbon		0.50					134.75	118.25	-16.50	16.50	134.75	229.35	2.00	12.55	1.84	-10.71	10.71	12.55	14.40	12.00		36.68	58.70	58.70	-58.70	12.55	133.10	21.00
Fe (mg/L)	Iron	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.283	0.119	-0.165	0.165	0.270	0.448	65.000	0.384	0.197	-0.188	0.188	0.315	0.645	12.000		3.241	0.203	0.203	-0.203	0.270	0.445	21.000
Filtration								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00
s as CaCO	ness as CaCO3		1					206.25	33.50	-172.75	172.75	203.50	241.00	48.00	220.17	33.84	-186.33	186.33	228.00	258.00	12.00		185.56	94.02	94.02	-94.02	220.00	258.00	21.00
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.00002	ND/calcula	0.00	0.00	0.00	0.00	0.00	0.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		0.14	0.00	0.00	0.00	0.00	0.00	4.00
K (mg/L)	Potassium		1					1.28	0.45	-0.83	0.83	1.00	2.00	32.00	1.67	0.94	-0.72	0.72	1.00	2.90	12.00		2.81	0.94	0.94	-0.94	1.00	2.00	21.00
Mg (mg/L)	Magnesium		1					8.60	1.55	-7.04	7.04	8.00	11.00	47.00	8.25	1.59	-6.66	6.66	9.00	10.00	12.00		9.19	3.77	3.77	-3.77	8.80	10.00	21.00
Mn (mg/L)	Manganese		0.01					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.08	0.03	-0.05	0.05	0.08	0.13	12.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	16.00
Na (mg/L)	Sodium		2		180			16.86	25.36	8.50	-8.50	11.00	19.00	50.00	14.67	5.25	-9.42	9.42	12.00	24.20	12.00		15.69	7.04	7.04	-7.04	13.50	24.40	21.00
-NH3 (mg/L	H3 (Ammonia)		0.02	1.0				0.068	0.046	-0.022	0.022	0.050	0.120	56.000	0.062	0.048	-0.014	0.014	0.049	0.125	6.000		3.815	0.130	0.130	-0.130	0.048	0.134	14.000
ized - calc	-ionized Ammonia[a])	0.02			0.0200			0.0026	0.0041	0.0015	-0.0015	0.0012	0.0050	28.0000	0.0049	0.0086	0.0037	-0.0037	0.0009	0.0136	6.0000		1.8699	0.0058	0.0058	-0.0058	0.0012	0.0053	14.0000
-NO2 (mg/	-NO2 (Nitrite)		0.10				0.6/0.2	4.61	0.00	-4.61	4.61	4.61	4.61	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		2.12	3.52	3.52	-3.52	4.61	4.61	4.00
-NO3 (mg/	NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	1.595	1.736	0.141	-0.141	0.940	3.420	61.000	2.561	1.677	-0.884	0.884	2.085	4.066	12.000		5.084	1.770	1.770	-1.770	1.748	4.294	21.000
- Total (mg	tal Phosphorus	0.03*	0.01	0.3	0.030			0.038	0.023	-0.014	0.014	0.031	0.059	62.000	0.042	0.030	-0.012	0.012	0.026	0.085	12.000		2.850	0.027	0.027	-0.027	0.025	0.081	21.000
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	5.01	4.99	-0.03	0.03	5.01	9.00	2.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		3.72	3.16	3.16	-3.16	5.00	7.01	5.00
pH	H (pH units)	6.5-8.5						20.28	98.22	77.93	-77.93	8.04	8.30	65.00	8.10	0.13	-7.97	7.97	8.12	8.23	12.00		14.60	30.31	30.31	-30.31	8.14	19.09	21.00
henols (mg/	Phenols	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.1441	0.3494	0.2053	-0.2053	0.0010	0.4018	7.0000	0.0039	0.0016	-0.0023	0.0023	0.0030	0.0058	7.0000		0.5660	0.1577	0.1577	-0.1577	0.0040	0.3206	12.0000
Se (mg/L)	Selenium	0.1	0.001					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00
SO4 (mg/L)	Sulphate		1				429	53.24	65.08	11.84	-11.84	37.00	92.80	67.00	44.75	13.69	-31.06	31.06	42.50	58.90	12.00		47.87	22.16	22.16	-22.16	45.50	70.50	21.00
ND - CALC	(COND - CALC)		5					279.68	54.68	-224.99	224.99	280.00	347.00	66.00	309.58	45.13	-264.45	264.45	330.00	354.50	12.00		261.93	128.21	128.21	-128.21	326.00	354.50	21.00
oluene (µg/L)					0.8	ND/.002	ND/0.0005	0.80	0.00	-0.80	0.80	0.80	0.80	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		0.49	0.61	0.61	-0.61	0.80	0.80	4.00
luene-d8 (%)								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	100.00	5.52	-94.48	94.48	102.00	104.70	4.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	5.00
dahl Nitrog	Kjeldahl Nitrogen		0.10					0.77	0.32	-0.46	0.46	0.77	1.08	66.00	1.14	0.28	-0.86	0.86	1.14	1.48	11.00		3.99	0.44	0.44	-0.44	0.87	1.39	20.00
P - Soluble (mg/L)								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.02	0.01	-0.01	0.01	0.01	0.03	11.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	15.00
pended So	Suspended Solids		2	10.0				6.57	6.13	-0.44	0.44	5.00	10.60	49.00	26.92	32.51	5.60	-5.60	11.00	52.90	12.00		18.74	27.05	27.05	-27.05	6.57	52.00	20.00
					600			600.00	0.00	-600.00	600.00	600.00	600.00	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		257.29	458.26	458.26	-458.26	600.00	600.00	4.00
Zn (mg/L)	Zinc	0.03	0.01	0.2	0.03	.037/.007	0.033/0.00	0.02	0.01	-0.01	0.01	0.02	0.03	4.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		0.58	0.01	0.01	-0.01	0.01	0.02	5.00
Field Data	**Field Data:**																												
emperatur	mperature (ºC)							10.20	8.30	-1.89	1.89	7.47	20.94	61.00	7.73	7.11	-0.62	0.62	6.10	18.32	10.00		9.83	6.79	6.79	-6.79	7.40	18.80	18.00
pH	field) (pH units)	6.5-8.5						17.22	71.27	54.05	-54.05	8.00	8.37	59.00	8.38	0.42	-7.97	7.97	8.38	8.75	12.00		13.07	21.70	21.70	-21.70	8.33	17.22	20.00
Conductivity	ivity (field) (µS/cm)							491.84	139.12	-352.71	352.71	468.00	663.50	62.00	443.92	83.66	-360.26	360.26	483.50	525.20	12.00		385.25	206.08	206.08	-206.08	472.00	545.00	20.00
ed Oxygen	solved Oxygen			4.00				9.57	3.05	-6.52	6.52	10.40	12.55	58.00	11.10	2.83	-8.26	8.26	11.62	14.34	12.00		11.71	4.62	4.62	-4.62	10.47	13.63	20.00

SWLTD1							SWLTD1 - All Data, Limited Samples								
								March 17, 2020 to December 9, 2020							
(L/sec) (including effluent discharge)															
				LIMS #											
				Sample ID											
				Sample Dat											
Analyte	Units	lytical Met	MRL	nalysis Da	PWQO (APV for Cl and Na)	CCME Surface Water Quality	Environment BC Surface Water	Mean	ndard Devia	Positive SD	egative SD	Median	90th %	N
hloroethane-d4 (%)								100.67	10.12	110.78	90.55	106.00	106.80	3.00
lorobenzene (µg/L)					4.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
ofluorobenzene (%)								100.67	9.29	109.96	91.38	105.00	106.60	3.00
Ag (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
ssolved) (n	mg/L	EPA 200.8	0.01	2020-03-18				0.09	0.09	0.19	0.00	0.04	0.20	7.00
y as CaCO3	mg/L	20,2510,45	5.00	2020-03-19				231.00	51.48	282.48	179.52	242.00	291.50	10.00
As (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18				0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
B (mg/L)	mg/L	EPA 200.8	0.01	2020-03-18	0.2*	29/1.5	ND/1.2	0.04	0.02	0.06	0.03	0.04	0.06	10.00
Ba (mg/L)	mg/L	EPA 200.8	0.01	2020-03-18				0.07	0.02	0.09	0.06	0.07	0.09	10.00
enzene (µg/L)					100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Ca (mg/L)	mg/L	M3120B-35	1.00	2020-03-18				100.30	18.92	119.22	81.38	104.50	118.20	10.00
BOD5 (mg/	mg/L	SM 5210B	1.00	2020-03-23				4.00	2.11	6.11	1.89	3.50	6.20	10.00
Cd (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18	0.00	.001/.00009	calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Cl (mg/L)	mg/L	SM 4110	1.00	2020-03-22		640/120	600/150	65.40	22.68	88.08	42.72	62.50	92.80	10.00
Co (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18			0.110/0.004	0.00	0.00	0.00	0.00	0.00	0.00	9.00
COD (mg/L	mg/L	C SM5220D	5.00	2020-03-20				31.30	18.54	49.84	12.76	22.00	51.20	10.00
ctivity (µmh	uS/cm	20,2510,45	5.00	2020-03-19				749.30	153.91	903.21	595.39	761.00	907.30	10.00
Cr (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18	0.01	ND/.001		0.00	0.00	0.00	0.00	0.00	0.00	3.00
Cu (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18		ND/.004	.029/≤0.00	0.00	0.00	0.00	0.00	0.00	0.01	10.00
romethane (µg/L)					100.00	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
DOC (mg/L	mg/L	SM 5310B	0.50	2020-03-20				10.23	3.76	13.99	6.47	9.90	15.68	10.00
Fe (mg/L)	mg/L	EPA 200.8	0.03	2020-03-18	0.30	ND/0.3	0.001/ND	0.55	0.56	1.11	-0.01	0.35	0.81	10.00
Filtration		EPA 200.8		2020-03-20				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
s as CaCO	mg/L	C SM2340B	1.00	2020-03-23				296.40	58.29	354.69	238.11	310.00	353.30	10.00
Hg (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18	0.00	ND/.000026	D/calculatio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
K (mg/L)	mg/L	M3120B-35	1.00	2020-03-18				3.90	2.02	5.92	1.88	3.50	5.40	10.00
Mg (mg/L)	mg/L	M3120B-35	1.00	2020-03-18				11.20	2.86	14.06	8.34	12.00	13.20	10.00
Mn (mg/L)	mg/L	EPA 200.8	0.01	2020-03-18				0.09	0.07	0.16	0.02	0.08	0.15	10.00
Na (mg/L)	mg/L	M3120B-35	2.00	2020-03-18	180.00			40.30	17.52	57.82	22.78	39.00	65.80	10.00
-NH3 (mg/L	mg/L	EPA 350.1	0.01	2020-03-18				0.16	0.22	0.38	-0.06	0.08	0.36	9.00
nized - calculated) (mg/L)					0.02			0.01	0.01	0.01	0.00	0.00	0.01	9.00
-NO2 (mg/L	mg/L	SM 4110	0.10	2020-03-22			0.6/0.2	0.15	#DIV/0!	#DIV/0!	#DIV/0!	0.15	0.15	1.00
-NO3 (mg/L	mg/L	M4500-NO	0.10	2020-03-24		124/3.0	32.8/3.0	5.59	3.31	8.90	2.28	5.48	8.90	10.00
- Total (mg/	mg/L	EPA 200.8	0.00	2020-03-18	0.03			0.23	0.21	0.44	0.02	0.17	0.42	10.00
Pb (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18	0.03	ND/.007	0.003/ND	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
pH		SM2320,2510,45	1.00	2020-03-19				8.05	0.17	8.21	7.88	7.96	8.27	10.00
henols (mg/	mg/L	NTRACT P	0.00	2020-03-20	0.00	ND/0.004	.050/ND	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Se (mg/L)	mg/L	EPA 200.8	0.00	2020-03-18				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
SO4 (mg/L)	mg/L	SM 4110	1.00	2020-03-22			429.00	45.20	10.32	55.52	34.88	47.50	54.80	10.00
ND - CALC	mg/L	C SM2540	1.00	2020-03-23				487.10	100.18	587.28	386.92	494.50	590.00	10.00
oluene (µg/L)		EPA 351.2	0.10	2020-03-20	0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
oluene-d8 (%)		EPA 200.8	0.00	2020-03-18				96.00	5.57	101.57	90.43	97.00	100.20	3.00
dahl Nitrogen (mg/L)		C SM2540	2.00	2020-03-19				1.64	0.91	2.55	0.74	1.37	3.01	10.00
P - Soluble (mg/L)		EPA 200.8	0.01	2020-03-18				0.17	0.21	0.38	-0.03	0.12	0.26	10.00
pended Solids (mg/L)								51.50	65.21	116.71	-13.71	24.00	145.40	10.00
					600.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zn (mg/L)					0.03	.037/.007	.033/0.007	0.01	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.01	1.00
Field Data														
Temperature								10.10	7.79	17.89	2.31	10.70	18.94	10.00
pH								8.23	0.33	8.56	7.90	8.23	8.61	10.00
Conductivity								713.30	144.95	858.25	568.35	708.00	872.70	10.00
ved Oxygen (mg/L)								9.98	3.86	13.84	6.12	10.77	14.68	10.00

SWMC1 LAB ID:						SWMC1 Group A - Pre 2019-05-08							SWMC1 Group B - 2019-05-23 to December 9, 2020								SWMC1 2020 AMR							
Stream flow (L/sec)						2006-11-30 to 2018-12-17							2019-5-23 to 2020-12-09								2020-01-10 to 2020-12-09							
Sample ID:			Reglated Effluent Parameter mg/L																		CA:CL							
				PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)																							
																			Water Quality Objective / Guideline								
Sample Date											Group A	Group A					Group B	Grp B							Group B	Grp B	
Analyte	PARAMETER	PWQO	MRL				Mean	Standard Deviation	+ve SD	-ve SD	Median	90th %	N (above detection limit)	Mean	ndard Deviat	+ve SD	-ve SD	Median	90th %	ve detection limit)		Mean	Standard Deviation	+ve SD	-ve SD	Median	90th %	N (above detection limit)
hloroethane-d4 (%)																						99.75	10.21	109.96	89.54	102.50	107.70	4.00
lorobenzene (µg/L)					4.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
ofluorobenzene (%)														102.00	9.95	111.95	92.05	98.00	112.80	7.00		100.25	8.02	108.27	92.23	101.50	107.10	4.00
Ag (mg/L)	Silver	0.0001	0.0001				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
issolved) (n	(dissolved	0.075*	0.01				0.06	0.09	0.15	-0.03	0.03	0.12	49.00	0.13	0.17	0.30	-0.05	0.03	0.40	12.00		0.16	0.19	0.35	-0.02	0.05	0.43	9.00
y as CaCO	linity as CaCO3		5				201.47	27.85	229.32	173.62	197.00	236.00	51.00	194.38	27.48	221.86	166.90	190.00	239.00	29.00		202.58	38.44	241.03	164.14	197.50	239.90	12.00
As (mg/L)	Arsenic	0.1	0.001				0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00		0.00	0.00	0.00	0.00	0.00	0.00	3.00
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.06	0.07	0.13	-0.01	0.04	0.10	51.00	0.08	0.04	0.12	0.04	0.07	0.11	29.00	1.20	0.09	0.06	0.15	0.03	0.08	0.18	12.00
Ba (mg/L)	Barium		0.01				0.06	0.01	0.07	0.05	0.06	0.07	51.00	0.06	0.01	0.08	0.05	0.06	0.08	29.00		0.06	0.01	0.07	0.04	0.06	0.07	12.00
enzene (µg/L)					100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Ca (mg/L)	Calcium		1					79.18	12.86	92.04	66.32	77.50	99.20	50.00	83.88	18.14	102.02	65.73	79.00	109.00	29.00		86.00	18.82	104.82	67.18	83.50	109.00	12.00
BOD5 (mg/	ical Oxygen Demand		1	10.0				1.86	0.99	2.85	0.87	2.00	3.00	36.00	4.27	1.33	5.60	2.93	4.00	6.20	15.00		4.70	1.42	6.12	3.28	4.50	7.00	10.00
Cd (mg/L)	Cadmium	0.0002	0.0001		0.0002	.001/.00009	calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Cl (mg/L)	Chloride		1			640/120	600/150	18.57	8.17	26.74	10.40	16.00	26.00	51.00	20.39	5.76	26.15	14.64	20.00	25.08	29.00	120.00	19.75	6.41	26.16	13.34	18.50	26.70	12.00
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	0.0005	0.0003	0.0007	0.0002	0.0004	0.0008	47.0000	0.0005	0.0003	0.0009	0.0002	0.0004	0.0009	17.0000		0.0005	0.0002	0.0007	0.0003	0.0005	0.0008	12.0000
COD (mg/L	al Oxygen Demand		5					36.12	13.76	49.88	22.35	33.00	48.00	51.00	43.45	16.09	59.54	27.36	37.00	63.20	29.00		43.33	18.59	61.93	24.74	36.50	61.50	12.00
uctivity (µm	uctivity (µS/cm)		5					525.65	89.12	614.77	436.52	510.00	646.00	51.00	552.17	96.51	648.68	455.66	513.00	677.40	29.00		559.08	101.42	660.50	457.67	538.50	685.20	12.00
Cr (mg/L)	romium (to	0.0089**	0.001		0.0089	ND/.001		0.0026	0.0018	0.0044	0.0008	0.0020	0.0044	39.0000	0.0025	0.0014	0.0039	0.0012	0.0020	0.0047	24.0000		0.0016	0.0007	0.0023	0.0008	0.0010	0.0022	9.0000
Cu (mg/L)	Copper	0.005	0.001	0.2		ND/.004	0.029/≤0.00	0.0025	0.0010	0.0035	0.0015	0.0020	0.0040	51.0000	0.0030	0.0008	0.0038	0.0021	0.0030	0.0040	29.0000	0.0020	0.0026	0.0008	0.0034	0.0018	0.0020	0.0039	12.0000
romethane (µg/L)					100.00	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
DOC (mg/L	ed Organic Carbon		0.50					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	14.79	3.86	18.65	10.93	14.20	18.52	29.00		15.33	5.20	20.53	10.12	14.35	20.87	12.00
Fe (mg/L)	Iron	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.87	0.80	1.66	0.07	0.60	1.50	51.00	1.12	0.69	1.81	0.43	0.85	2.23	29.00	0.30	0.72	0.30	1.02	0.42	0.64	1.13	12.00
Filtration								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
s as CaCO	ness as CaCO3		1					247.84	38.13	285.97	209.71	237.00	304.00	50.00	266.17	52.23	318.40	213.94	250.00	334.80	29.00		267.00	56.71	323.71	210.29	264.50	333.70	12.00
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.000026	D/calculatio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
K (mg/L)	Potassium		1					3.30	2.66	5.96	0.64	3.00	4.00	50.00	4.01	1.94	5.95	2.07	3.90	5.52	29.00		3.08	0.90	3.98	2.18	3.00	4.00	12.00
Mg (mg/L)	Magnesium		1					12.16	2.38	14.54	9.78	12.00	16.00	50.00	13.76	2.46	16.21	11.30	14.00	16.50	29.00		12.67	2.81	15.47	9.86	13.00	15.90	12.00
Mn (mg/L)	Manganese		0.01					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.10	0.04	0.13	0.06	0.09	0.16	29.00		0.10	0.03	0.13	0.07	0.10	0.13	12.00
Na (mg/L)	Sodium		2		180.00			17.16	12.73	29.89	4.43	14.50	25.10	50.00	17.12	3.68	20.81	13.44	16.00	22.16	29.00	180.00	17.33	4.14	21.47	13.19	17.00	23.50	12.00
N-NH3 (mg/L	NH3 (Ammonia)		0.02	1.0				0.17	0.12	0.29	0.05	0.14	0.31	50.00	0.14	0.09	0.23	0.05	0.13	0.23	27.00	NA	0.18	0.12	0.30	0.05	0.15	0.31	11.00
hized - calc	-ionized An	0.02			0.020			0.0022	0.0024	0.0045	-0.0002	0.0014	0.0052	48.0000	0.0044	0.0076	0.0120	-0.0032	0.0012	0.0106	19.0000	2.0000	0.0067	0.0094	0.0160	-0.0027	0.0024	0.0231	11.0000
-NO2 (mg/	NO2 (Nitrite)		0.10				0.6/0.2	0.12	0.00	0.12	0.12	0.12	0.12	2.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
N-NO3 (mg/L	NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	2.56	2.35	4.91	0.20	1.63	4.90	51.00	3.43	3.56	6.99	-0.14	2.56	7.31	28.00	3.00	2.77	2.01	4.78	0.75	3.02	5.41	11.00
- Total (mg/	tal Phosphor	0.03*	0.01	0.3	0.030			0.098	0.095	0.192	0.003	0.060	0.210	51.000	0.101	0.054	0.155	0.048	0.100	0.170	29.000	0.030	0.090	0.049	0.138	0.041	0.099	0.146	12.000
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
pH	H (pH units	6.5-8.5						8.10	0.11	8.22	7.99	8.10	8.24	51.00	8.13	0.14	8.27	7.99	8.14	8.29	17.00		8.08	0.13	8.21	7.95	8.10	8.24	12.00
henols (mg/	Phenols	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.004	0.005	6.00		0.00	0.00	0.00	0.00	0.00	0.00	6.00
Se (mg/L)	Selenium	0.1	0.001					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
SO4 (mg/L)	Sulphate		1				429.00	42.10	19.07	61.17	23.03	36.00	71.00	51.00	58.55	26.14	84.69	32.41	47.00	94.20	29.00	429.00	59.75	18.17	77.92	41.58	63.00	82.00	12.00
OND - CALC	(COND - CALC)		5					341.69	57.94	399.63	283.74	332.00	420.00	51.00	345.97	67.53	413.49	278.44	319.00	436.80	29.00		363.25	65.99	429.24	297.26	350.00	445.20	12.00
oluene (µg/L)					0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
oluene-d8 (%)								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	99.14	5.84	104.99	93.30	101.00	104.60	7.00		100.50	6.81	107.31	93.69	102.00	105.80	4.00
dahl Nitrog	Kjeldahl Nitrogen		0.10					1.11	0.48	1.59	0.63	0.96	1.80	51.00	1.30	0.54	1.84	0.76	1.10	2.16	29.00		1.57	0.74	2.31	0.82	1.34	2.66	12.00
P - Soluble	(mg/L)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.03	0.02	0.05	0.01	0.03	0.05	17.00		0.03	0.02	0.05	0.01	0.02	0.05	12.00
pended Sol	Suspended Solids		2	10.0				24.69	25.18	49.86	-0.49	16.00	46.00	51.00	37.28	22.67	59.95	14.60	30.00	67.60	29.00		43.75	25.34	69.09	18.41	36.50	76.70	12.00
					600.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zn (mg/L)	Zinc	0.03	0.01	0.2	0.03	.037/.007	0.033/0.007	0.01	0.00	0.01	0.01	0.01	0.01	5.00	0.01	0.00	0.02	0.01	0.01	0.02	11.00		0.02	0.01	0.02	0.01	0.02	0.02	3.00
Field Data	Field Data:														#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Temperatur	mperature (ºC)							8.16	8.21	7.71	15.92	0.50	6.00	18.84	49.00	9.43	9.16	18.59	0.27	7.40	20.91	14.00		7.16	7.63	14.78	-0.47	6.00	18.94	12.00
pH	field) (pH u	6.5-8.5						7.71	7.82	0.73	8.55	7.08	7.74	8.04	48.00	8.70	3.26	11.96	5.45	8.34	11.33	24.00		8.13	0.73	8.86	7.41	8.20	8.80	12.00
Conductivity	ivity (field) (µS/cm)							586.60	578.84	162.46	741.30	416.38	556.50	737.80	48.00	268.10	254.90	523.00	13.20	265.00	597.50	24.00		449.42	171.81	621.22	277.61	482.50	622.40	12.00
solved Oxy	ssolved Oxygen			4.00				9.27	17.16	54.54	71.70	-37.38	9.90	12.76	47.00	159.05	307.56	466.61	-148.50	11.39	554.60	18.00		99.88	313.40	413.27	-213.52	10.40	13.25	12.00

SWMC2

					SWMC2 - Background Group A - 2006-2-28 to 2018-12-17							SWMC2 - Background Group B - 2019-5-23 to 2020-12-9									SWMC2 - Flow Proportional Discharges - 2020-1-10 to 2020-12-9								
LAB ID:																												
Date Sampled:			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline Short/Lon	Environment BC Surface Water Quality Guideline							BC - BX									BQ:CA								
SWMC3 Measured Flow																			Water Quality Objective / Guideline								Water Quality Objective / Guidelin
SWAF Measured Flow																												
SWMC2 Estimated Flow																												
Analyte	PARAMETER	PWQO	MRL																									
loroethane-d4 (%)																					99.00	9.38	108.38	89.62	100.00	107.20	4.00		
lorobenzene (µg/L)				4.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
fluorobenzene (%)													107.29	12.28	119.57	95.00	111.00	119.20	7.00		103.25	10.01	113.26	93.24	106.00	111.00	4.00		
Ag (mg/L)	Silver	0.0001	0.0001				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
ssolved) (n	I (dissolve	0.075*	0.01				0.04	0.03	0.07	0.01	0.02	0.07	42.00	0.10	0.16	0.26	-0.07	0.02	0.26	15.00		0.14	0.19	0.33	-0.06	0.03	0.30	10.00		
as CaCO	linity as CaCO3		5				197.90	26.98	224.88	170.91	198.00	229.30	48.00	189.00	29.49	218.49	159.51	185.00	230.00	21.00		191.09	35.93	227.02	155.16	185.00	231.00	11.00		
As (mg/L)	Arsenic	0.1	0.001				0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00		0.00	0.00	0.00	0.00	0.00	0.00	3.00		
B (mg/L)	Boron	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.039	0.023	0.061	0.016	0.030	0.073	48.000	0.075	0.052	0.127	0.023	0.050	0.140	21.000	0.000 1.20	0.092	0.065	0.157	0.027	0.060	0.200	11.000	0.000	1.200
Ba (mg/L)	Barium		0.01				0.06	0.01	0.07	0.04	0.06	0.07	48.00	0.06	0.01	0.07	0.05	0.06	0.08	21.00		0.05	0.01	0.06	0.05	0.06	0.06	11.00		
enzene (µg/L)				100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	67.00	#DIV/0!	#DIV/0!	#DIV/0!	67.00	67.00	1.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Ca (mg/L)	Calcium		1				80.38	16.15	96.53	64.22	81.00	98.60	48.00	82.25	16.21	98.46	66.04	79.00	104.40	20.00		82.09	17.25	99.34	64.84	79.00	104.00	11.00		
BOD5 (mg	cal Oxygen Demand		1				1.76	0.78	2.55	0.98	2.00	3.00	34.00	4.00	2.57	6.57	1.43	3.50	6.20	18.00		3.78	1.09	4.87	2.68	4.00	5.00	9.00		
Cd (mg/L)	Cadmium	0.0002	0.0001	0.0002	001/.0000	calculation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Cl (mg/L)	Chloride		1		640/120	600/150	17.19	4.84	22.03	12.35	17.00	23.00	48.00	18.10	3.86	21.95	14.24	19.00	22.00	21.00	0.00 120.00	18.09	4.83	22.92	13.26	17.00	25.00	11.00	0.00	120.00
Co (mg/L)	Cobalt	0.0009	0.0002			0.110/0.004	0.0003	0.0001	0.0005	0.0002	0.0003	0.0004	38.0000	0.0005	0.0004	0.0008	0.0001	0.0004	0.0005	21.0000		0.0004	0.0004	0.0008	0.0001	0.0004	0.0005	11.0000		
COD (mg/L	al Oxygen Demand		5				32.77	12.30	45.07	20.47	32.00	48.00	48.00	36.29	14.06	50.35	22.22	34.00	48.00	21.00		40.09	17.01	57.11	23.08	38.00	55.00	11.00		
uctivity (µm	uctivity (µS/cm)		5				510.75	80.13	590.88	430.62	504.50	616.30	48.00	520.10	96.73	616.83	423.36	493.00	676.00	21.00		528.91	98.26	627.17	430.65	493.00	634.00	11.00		
Cr (mg/L)	romium (to	0.0089**	0.001	0.0089	ND/.001		0.0018	0.0012	0.0031	0.0006	0.0020	0.0020	31.0000	0.0020	0.0012	0.0032	0.0008	0.0020	0.0037	14.0000		0.0019	0.0015	0.0033	0.0004	0.0010	0.0032	7.0000		
Cu (mg/L)	Copper	0.005	0.001		ND/.004	.029/≤0.00	0.0018	0.0006	0.0024	0.0012	0.0020	0.0025	46.0000	0.0026	0.0014	0.0040	0.0012	0.0020	0.0030	21.0000	7.0000 0.002	0.0025	0.0013	0.0037	0.0012	0.0020	0.0030	11.0000	3.0000	0.0020
romethane (µg/L)				100.00	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
DOC (mg/L	d Organic Carbon		0.50				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	14.77	4.14	18.91	10.63	13.60	18.90	21.00		14.98	5.33	20.32	9.65	12.70	22.10	11.00		
Fe (mg/L)	Iron	0.3	0.03	0.300	ND/0.3	0.001/ND	0.543	0.389	0.933	0.154	0.405	0.896	48.000	0.709	0.564	1.273	0.145	0.570	0.780	21.000	20.000 0.300	0.665	0.487	1.152	0.179	0.510	0.780	11.000	11.000	0.300
Filtration							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
s as CaCO	ness as CaCO3		1				247.48	47.16	294.63	200.32	246.00	305.40	48.00	252.57	47.94	300.51	204.64	243.00	321.00	21.00		252.55	51.82	304.37	200.73	243.00	319.00	11.00		
Hg (mg/L)	Mercury	0.0002	0.0001	0.00	ND/.00002	D/calculati	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
K (mg/L)	Potassium		1				2.63	0.82	3.44	1.81	2.00	4.00	48.00	3.19	1.03	4.22	2.16	3.00	5.00	21.00		3.09	1.14	4.23	1.95	3.00	5.00	11.00		
Mg (mg/L)	Magnesium		1				11.19	2.27	13.45	8.92	11.00	14.00	48.00	11.90	2.55	14.45	9.36	12.00	15.00	21.00		11.55	2.70	14.24	8.85	12.00	14.00	11.00		
Mn (mg/L)	Manganese		0.01				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.08	0.03	0.11	0.05	0.08	0.12	21.00		0.08	0.03	0.11	0.06	0.08	0.12	11.00		
Na (mg/L)	Sodium		2	180.00			13.42	4.10	17.52	9.32	12.00	19.30	48.00	14.10	3.00	17.09	11.10	13.00	18.00	21.00	0.00 180.00	14.45	3.01	17.47	11.44	14.00	16.00	11.00	0.00	180.00
-NH3 (mg/	H3 (Ammonia)		0.02				0.208	0.132	0.340	0.076	0.172	0.336	45.000	0.151	0.114	0.265	0.038	0.120	0.210	19.000	NA	0.167	0.149	0.317	0.018	0.137	0.238	10.000		NA
nized - calc	-ionized Ar	0.02		0.020			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	42.000	0.006	0.011	0.017	-0.005	0.003	0.008	15.000	12.000 0.020	0.006	0.013	0.020	-0.007	0.002	0.008	10.000	7.000	0.020
-NO2 (mg/	-NO2 (Nitrite)		0.10			0.6/0.2	0.10	#DIV/0!	#DIV/0!	#DIV/0!	0.10	0.10	1.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
-NO3 (mg/	NO3 (Nitrate)		0.10		124/3.0	32.8/3.0	2.376	1.771	4.148	0.605	1.840	5.005	46.000	3.412	3.201	6.613	0.212	2.640	8.310	21.000	9.000 3.000	2.769	2.032	4.801	0.737	2.790	5.800	11.000	5.000	3.000
Total (mg	al Phosphc	0.03*	0.01	0.030			0.052	0.040	0.092	0.012	0.040	0.092	48.000	28.000	0.075	0.054	0.130	0.021	0.056	0.123	21.000	19.000 0.03	0.071	0.058	0.129	0.013	0.051	0.100	11.000	9.000	0.030
Pb (mg/L)	Lead	0.025	0.001	0.025	ND/.007	0.003/ND	0.00	0.00	0.00	0.00	0.00	0.00	2.00		0.00	0.00	0.00	0.00	0.00	0.00	2.00		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00		
pH	H (pH units	6.5-8.5					8.10	0.17	8.27	7.93	8.12	8.27	48.00	8.14	0.19	8.34	7.95	8.11	8.38	21.00		8.08	0.15	8.22	7.93	8.07	8.24	11.00		
henols (mg	Phenols	0.001	0.001	0.0010	ND/0.004	.050/ND	0.0028	0.0005	0.0033	0.0023	0.0030	0.0030	4.0000	0.0046	0.0005	0.0051	0.0041	0.0050	0.0050	5.0000		0.0045	0.0006	0.0051	0.0039	0.0045	0.0050	4.0000		
Se (mg/L)	Selenium	0.1	0.001				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
SO4 (mg/L	Sulphate		1			429.00	40.27	20.32	60.59	19.95	35.50	69.00	48.00	52.29	22.55	74.83	29.74	43.00	83.00	21.00	0.00 429.00	55.18	17.53	72.71	37.65	50.00	80.00	11.00	0.00	429.00
ND - CALC	(COND - CALC)		5				331.98	52.06	384.04	279.92	328.00	400.30	48.00	338.00	62.92	400.92	275.08	320.00	439.00	21.00		343.82	64.02	407.84	279.80	320.00	412.00	11.00		
oluene (µg/L)				0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
oluene-d8 (%)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	100.29	7.09	107.37	93.20	102.00	107.60	7.00		102.00	8.64	110.64	93.36	104.00	108.80	4.00		
dahl Nitrog	Kjeldahl Nitrogen		0.10				1.04	0.40	1.44	0.63	0.93	1.53	46.00	1.38	0.54	1.92	0.84	1.22	1.91	21.00		1.53	0.69	2.23	0.84	1.29	2.49	11.00		
P - Soluble (mg/L)							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	0.03	0.02	0.05	0.01	0.02	0.06	21.00		0.02	0.02	0.04	0.01	0.01	0.04	11.00		
pended So	Suspended Solids		2				9.98	8.02	18.00	1.96	8.00	17.20	47.00	52.81	112.76	165.57	-59.95	17.00	57.00	21.00		64.18	148.26	212.44	-84.08	17.00	46.00	11.00		
				600.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00		
Zn (mg/L)	Zinc	0.03	0.01	0.03	.037/.007	.033/0.0075																								

SWMC3							SWMC3 - All Data, Limited Samples						
			Meets PWQO										
			Exceeds PWQO										
			Meets CCME or MOE BC long term guideline										
			Exceeds CCME or MOE BC long term guideline										
(L/sec) (including effluent discharge)													
Discharge (L/sec)													
ly signed PDF version of the report for official results.				PWQO (APV for	CCME Surface	Environm ent BC							
Analyte	**Units**	**lytical Met**	**MRL**	Cl and Na)	Water	Surface	Mean	ıdard Devia	Positive SD	egative SD	Median	90th %	N
hloroethane	%	EPA 8260	0.00				97.61	9.09	106.71	88.52	100.00	106.80	7.00
lorobenzen	ug/L	EPA 8260	0.40	4.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
ofluorobenz	%	EPA 8260	0.00				101.29	8.94	110.22	92.35	102.00	110.40	7.00
Ag (mg/L)	mg/L	EPA 200.8	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
issolved) (r	mg/L	EPA 200.8	0.01				0.08	0.19	0.27	-0.11	0.02	0.07	15.00
y as CaCO	mg/L	20,2510,45	5.00				210.95	29.17	240.13	181.78	214.50	242.80	22.00
As (mg/L)	mg/L	EPA 200.8	0.00				0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
B (mg/L)	mg/L	EPA 200.8	0.01	0.2*	29/1.5	ND/1.2	0.03	0.01	0.04	0.02	0.03	0.04	22.00
Ba (mg/L)	mg/L	EPA 200.8	0.01				0.07	0.01	0.08	0.06	0.07	0.08	22.00
enzene (µg/	ug/L	EPA 8260	0.50	100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Ca (mg/L)	mg/L	M3120B-35	1.00				99.05	16.59	115.63	82.46	99.50	118.80	22.00
BOD5 (mg/	mg/L	SM 5210B	1.00				3.70	1.75	5.45	1.95	3.00	6.10	20.00
Cd (mg/L)	mg/L	EPA 200.8	0.00	0.00	001/.0000	calculation	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
Cl (mg/L)	mg/L	SM 4110	1.00		640/120	600/150	28.32	4.70	33.02	23.61	28.00	33.90	22.00
Co (mg/L)	mg/L	EPA 200.8	0.00			0.110/0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00
COD (mg/L	mg/L	C SM5220D	5.00				17.73	7.85	25.58	9.88	15.50	30.40	22.00
uctivity (µm	uS/cm	C SM2510B	5.00				611.77	89.39	701.17	522.38	625.00	724.00	22.00
Cr (mg/L)	mg/L	EPA 200.8	0.00	0.01	ND/.001		0.00	0.00	0.00	0.00	0.00	0.00	3.00
Cu (mg/L)	mg/L	EPA 200.8	0.00		ND/.004	.029/≤0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
romethane	ug/L	EPA 8260	4.00	100.00	ND/9811		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
DOC (mg/L	mg/L	NTRACT-E-	0.50				7.84	1.47	9.31	6.37	7.60	9.98	22.00
Fe (mg/L)	mg/L	EPA 200.8	0.03	0.30	ND/0.3	0.001/ND	0.25	0.13	0.38	0.12	0.22	0.45	22.00
Filtration		EPA 200.8					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
s as CaCO	mg/L	C SM2340B	1.00				298.55	50.43	348.97	248.12	299.00	362.50	22.00
Hg (mg/L)	mg/L	EPA 200.8	0.00	0.00	ND/.00002	D/calculati	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
K (mg/L)	mg/L	M3120B-35	1.00				2.86	0.94	3.80	1.92	3.00	4.00	22.00
Mg (mg/L)	mg/L	M3120B-35	1.00				12.45	2.56	15.01	9.90	13.00	15.90	22.00
Mn (mg/L)	mg/L	EPA 200.8	0.01				0.04	0.02	0.06	0.02	0.04	0.07	22.00
Na (mg/L)	mg/L	M3120B-35	2.00	180.00			15.14	3.40	18.54	11.74	15.50	18.90	22.00
-NH3 (mg/	mg/L	BCONTRAC	0.01				0.08	0.13	0.22	-0.05	0.04	0.10	16.00
nized - calculated) (mg/L)				0.02			0.00	0.00	0.00	0.00	0.00	0.00	12.00
-NO2 (mg/	mg/L	SM 4110	0.10			0.6/0.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
-NO3 (mg/	mg/L	SM 4110	0.10		124/3.0	32.8/3.0	3.70	3.32	7.02	0.37	2.82	8.98	22.00
- Total (mg	mg/L	EPA 200.8	0.00	0.03			0.04	0.03	0.07	0.01	0.03	0.08	22.00
Pb (mg/L)	mg/L	EPA 200.8	0.00	0.03	ND/.007	0.003/ND	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
pH		SM2320,2510,45	1.00				8.24	0.14	8.38	8.09	8.25	8.38	22.00
henols (mg/	mg/L	BCONTRAC	0.00	0.00	ND/0.004	.050/ND	0.00	0.00	0.00	0.00	0.00	0.01	6.00
Se (mg/L)	mg/L	EPA 200.8	0.00				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
SO4 (mg/L	mg/L	SM 4110	1.00			429.00	66.41	25.15	91.56	41.26	61.00	97.80	22.00
DND - CALC	mg/L	C SM2540	1.00				397.59	58.06	455.65	339.53	406.50	470.40	22.00
oluene (µg/	ug/L	EPA 8260	0.50	0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
oluene-d8 (%	%	EPA 8260	0.00				99.57	5.56	105.13	94.01	101.00	105.00	7.00
dahl Nitrog	mg/L	BCONTRAC	0.15				0.97	0.43	1.40	0.54	0.91	1.39	21.00
P - Soluble	mg/L	EPA 200.8	0.00				0.02	0.02	0.04	0.00	0.01	0.05	22.00
pended Sol	mg/L	C SM2540	2.00				13.15	14.18	27.33	-1.03	10.00	20.20	20.00
	ug/L	EPA 8260	0.20	600.00			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zn (mg/L)	mg/L	EPA 200.8	0.01	0.03	.037/.007	.033/0.007	0.01	0.01	0.02	0.01	0.01	0.02	3.00
Field Data													
Temperature							10.09	7.35	17.44	2.75	9.90	18.90	21.00
pH							7.98	0.65	8.63	7.34	8.00	8.65	20.00
Conductivity							564.31	154.99	719.29	409.32	603.50	697.60	20.00
ved Oxygen (mg/L)							10.78	2.91	13.69	7.87	11.69	14.30	21.00

Appendix I

Summary of Treated Effluent Quality Data for all Water Quality Variables for 2016 - 2020

2016 LTF Effluent Data:

The 2016 LTF effluent data was recovered from the 2016 annual report with East and West Pond effluent samples reported rather than the effluent as it left the plant. These data should be used with caution as they were recovered using Optical Character Recognition and may not be reliable and the sampling location for the data and the format are not directly comparable to reports for other years.

LAFLECHE ENVIRONMENTAL INC. ASI Group Project OH15-003

Leachate Treatment Facility, 2016 Annual Report February 3, 2017

Table 5: Prior to Discharge Effluent Holding Pond Monitoring Analytical Results

Parameter	PWQO	Un ks	West Pond 4-]an-15	East Pond 20-7an -16	West Pond 8-Feb-16	West Pond 18-Feb-16	East Pond 29-Feb-16	West Pond 15-Mar-16	West Pond 24-Mar-16	West Pond 29-Mar-16	East Pond 30-Mar-16
			1-16	2-16	3-16	R.r.ample	4-16	5-16	n.am ple	rl.a mple	6-16
			comp	comp	comp	comp	comp	corn p	comp	comp	comp
r	9.9 tO	pH	6.68	7.85	7.36	7.79	7.49	7.55		7.85	7.79
Temperature		'C	3.8	as	42	53	5.3	8.6		*82*	11
DO	4	nxilL	12.77	13.8	12.89	7.89	12	11.03		11.45	12.24
Condudimiy(re		uS,Acm	5560	6900	6620	6890	6450	6150		6132	5460
alkalinity		rrriel_	778	747	702		707	760			544
CBOD5	10	m/ L		2	4		<2	3			J.
COO		mg/ L	324	343	3135		382	3138			260
Chloride		real	1050	946	900		831	247			725
Conductivity		L.E,krn	7130	7080	7020		B700	5990			5530
DOC		rug&	107	139	130		122	122			110
N-NH3	1	ro:IL	0.146	0.204	0.242		1	2.53	1.3	0.103	1.03
NO2		rna/L	43.10	0.11	0.64		1.98	112			4.71
NO3		rrriel_	296	310	291		309	283			228
Phenols	0.00s	,,,'ı	0.001	0.001	0.002		0.003	0000.003			0.002
Sulphate		rrrieL	315	266	255		194	193			323
TDS		rrrieL	4990	4600	4560		4393.	4540			3870
TKN		mg&	31.8	76.2	04.8		83.7	28.4			20.4
TP	0.3	ritgiL	0.19	0.20	000.370	0.23	0.158	0.27			0.081
TSS	10	rngiL	<2	<2	5		4	<2			10
CA		mgel_	139	118	118		93	88			42.0
Magnesium		mgeL	178	162	157		1313	137			100
Potassium		rrrylL	437	416	432		303	355			272
Sodium		rrrieL	1360	1150	1040		984	1000			901
BA		mgel_	00.1	0.2	02		02	02			0.1
Boron	0200	r4ı	8	9.1	8		8.8	6.8			6.1
Cadmium	0.9002	rrel	43.001	<0.001	43.001		<3.0111	00.0131			4311301
Chromium	0.0089	mall	0.03	0.03	0D2		D.03	am.			002
Copper	1	rug&	<001	<0.01	<0.01		<0.01	<0.01			<0.01
FE	1	malL	<0.3	<0.3	<0.3		<0.3	<0.3			<0.3
LEAD	0.025	mgeL	43D1	.0.01	43.01		0301	00.01			<0.01
Manganese		rrrieL	<OA	<0.1	=0.1		00.1	00.1			<0.1
Mercury	5ı01302	mg¨/	0.0302	0.0002	00002		.3 3:3.6	.=..=2.=2			0.0003
ZINC	02	rrryiL	<0.1	<0.1	<0.1		0.1	<0.1			0.2
1,4-dh h brobe	4	pgeL	<0.4	.0.4	43.4		00.4	00.4			.0.4
Benzene	100	ₖiL	00.5	<0.5	=13.5		00.5	00.8			<0.5
DICHLOROMET	100	41	<4.0	<4.0	<4.0		<4.0	<4.0			<4.0
TOLUENE	0 8.ˋ	pall_	00.5	9.6	00.5		00.5	00.5			<9.5
Vinyl Ch bride	soo-	⌈la/ i-	00.2	.0.2	00.2		00.2	00.2			<02
UNIONIZED	0.02	rrel	0.0001	0.0023	0.0008		0.0048	0.0180		0.0014	0.0153

Table 5: Prior to Discharge Effluent Holding Pond I

Parameter	PWQO	Un ks	West Pond 12-Apr-16	East Pond 25-Apr-16	West Pond 9-May-16	East Pond 24-May-16	West Pond 13-7u n -16	East Pond 27-7 un -16	West Pond 11 -7 u1-16	West Pond 18-7u 816	East Pond 25-3r11-16
			7-16	8-16	9-16	10-16	11-16	12-16	13-16	rl.a mple	14-16
			comp	comp	comp	comp	comp	comp	comp	comp	comp
r	9.9 tO	pH	7.43	7.75	7.71	8	8.2	7.94	7.89	7.52	7.71
Temperature		'C	12.3	12.0	16.4	16	16	16.1	21.6	21.4	215
DO	4	nxilL	12.94	13	12.5	10.6	10.35	11.12	9.47	9.38	7.16
Condudimiy(re		uS,Acm	5860	6600	7150	6940	7870	7959	7732	7120	6989
alkalinity		rrriel_	404	223	310	318	226	342	407		425
CBOD5	10	m/ L	<1	2	<1	J.	1		2		J.
COO		mg/ L	233	298	326	335	290	301	365		349
Chloride		real	718	294	0.372	896	1060	1060	1040		1050
Conductivity		L.E,krn	57130	0510	3900	7180	7580	7730	12V		7720
DOC		rug&	88.2	95	119	242	110	118	200		130
N-NH3	1	ro:IL	0000	0.00100	0000.930	0.313	0000.224	0.377	1.18		0.608
NO2		rna/L	2.013	17.0	am	0.59	0.34	037	0.83		0.72
NO3		rrriel_	215	307	336	375	394	393	393		361
Phenols	0.00s	,,,'ı	0.002	0000	<0.005	0.002	0.001	0.001	0.002		0.002
Sulphate		rrrieL	545	614	597	515	700.	0602	542		569
TDS		rrrieL	4320	4630	13000	5380	6140	5390	5790		5790
TKN		mg&	55.6	76.7	43.2	97.2	44.0	585	127		49.5
TP	0.3	ritgiL	0000.089	0.21	0.142	*0.22*	0.141	0.140	0.213		0.11
TSS	10	rngiL	<1	<1	<2	<2	5	10	17	<1	<1
CA		mgel_	58	77	94	123	130	138	157		139
Magnesium		mgeL	115	150	142	155	147	168	170		164
Potassium		rrrylL	296	409	423	417	420	4131	409		453
Sodium		rrrieL	1000	1180	1150	1220	1110	1310	1300		1300
BA		mgel_	02	03	03	0.4	0.4	0.4	03		0.3
Boron	0200	r4ı	6.9	7.6	8	8.6	8.3	8.5	8		8.0
Cadmium	0.9002	rrel	43.001	43.1301	13.001	*.0.001*	<0.001	43.001	00.001		.0.001
Chromium	0.0089	mall	0.01	0.02	0.02	0.02	0.02	002	0.02		0.03
Copper	1	rug&	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
FE	1	malL	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		<0.3
LEAD	0.025	mgeL	<001	43D1	<001	<0.01	00.01	43.01	00.01		.0.01
Manganese		rrrieL	=0.1	43.1	00.1	<0.1	00.1	43.1	00.1		<0.1
Mercury	5ı01302	mg¨/	00006	0.0003	<001301	<0.0001	0cco2	<2..2.2.z1	: :::		0.0002
ZINC	02	rrryiL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
1,4-dh h brobe	4	pgeL	00.4	43.4	00.4	<0.4	<114	00.4	00.4		.0.4
Benzene	100	kiL	00.5	43.5	00.5	<0.5	<0.5	005	00.5		.0.5
DICHLOROMET	100	41	<4.0	<4.0	<4.0	<4.0	<4.0	<AD	<4.0		<4.0
TOLUENE	0 8.ˋ	pall_	435	43.5	<0.5	<0.5	435	005	00.5		<9.5
Vinyl Ch bride	soo-	⌈la/ i-	00.2	=0.2	00.2	<0.2	00.2	002	00.2		<0.2
UNIONIZED	0.02	rrel	0.0020	0.0097	0.0173	0.0173	0.0121	0.0115	0.0478	0.0043	0.0164

Table 5: Prior to Discharge Effluent Holding Pond I

Parameter	PWQO	Un ks	;Vint Pond	East Pond	West Pond	East Pond	East Pond	West Pond	East Pond	East Pond	West Pond
			8-Aug-16	23-Aug-16	12-Sep-16	27-Sep-16	5-Oct-16	11-Oct-16	27-Oct-16	7-Nov-16	16-Nov-16
			15-16	16-16	17-16	16-16	rl.a mple	19-16	20-16	20-16	21-16
			Comp	comp	comp	comp	comp	comp	comp	comp	corn p
r	9.9 tO	pH	8	7.92	8.1	8.2	8.1	8.2	7.99	9	8.1
Temperature		'C	23.1	16.9	23.1	18.8	17.S	13.5	11.2	10.5	8
DO	4	nxilL	8.18	8.01	7.89	7.62	7.77	12.46	10	11.52	9.97
Condudimiy(re		uS,Acm	7130	6943	7150	7380	7258	7320	7160	7080	7200
alkalinity		rrriel_	504	54	353	395		737	469		318
CBOD5	10	m/ L	J.	J.	<1	2		2			1
COO		mg/ L	355	342	370	344		403	351.		312
Chloride		real	1119	982	1080	1080		1099	930		900
Conductivity		L.E,krn	7990	8300	7810	8690		7690	7490		7100
DOC		rug&	134	126	120	124		30.1	136		101
N-NH3	1	ro:IL	0.236	0.194	0.209	0.200		0.219	2.17	0.55	0.67
NO2		rna/L	0.26	0.28	0.39	0.34		0.43	0.75		1.26
NO3		rrriel_	392	366	347	352		347	324		300
Phenols	0.00s	,,,'ı	<0.001	0.001	0.001	0.001		0.001	0.002		0.005
Sulphate		rrrieL	565	485	761	730		399	530		718
TDS		rrrieL	5990	5810	6250	6520		5380	5620		5320
TKN		mg&	78.5	211	5.30	<6		46.2	121		11.1
TP	0.3	ritgiL	0.165	0.21.	0.198	0,000.154		0.083	0.015		0.080
TSS	10	rngiL	*2*	*<1*	*<1*	16	6	6	4		4
CA		mgel_	150	138	130	135		108	100		103
Magnesium		mgeL	181	163	166	160		135	139		129
Potassium		rrrylL	510	455	444	443		376	322		359
Sodium		rrrieL	1479	1310	1469	1420		1200	1220		1250
BA		mgel_	0.3	0.3	0.3	0.2		0.2	0.2		0.3
Boron	0200	r4ı	9.3	8.9	9.4	9.1		9.1	8.7		7.9
Cadmium	0.9002	rrel	<0.001	<0.001	<0.001	.0.001		<0.001	<0.001		<0.001
Chromium	0.0089	mall	0.03	0.03	0.02	0.03		0.03	0.03		0.02
Copper	1	rug&	<0.01	<0.01	<0.01	<0.01		<0.01	<9.91		<0.01
FE	1	malL	<0.3	<0.3	<0.3	<0.3		<0.3	<0.3		<0.3
LEAD	0.025	mgeL	<0.01	<0.01	<0.01	.0.01		.0.01	.0.01		<0.01
Manganese		rrrieL	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1		<0.1
Mercury	5ı01302	mg¨/	<0.0001	<0.0001	0.0005	0.0001		.0.0001	0.0017		0.0001
ZINC	02	rrryiL	<0.1	<0.1	<0.1	<0.1		0.1	<0.1		<0.1
1,4-dh h brobe	4	pgeL	.0.4	<0.4	.0.4	.0.4		.0.4	.0.4		.0.4
Benzene	100	ₖiL	.0.5	.0.S	.0.5	.0.5		.0.5	.0.5		.0.5
DICHLOROMET	100	41	.4.0	<4.0	<4.0	<4.0		<4.0	<4.0		<4.0
TOLUENE	0 8.ˋ	pall_	<9.5	<9.5	<9.5	<0.5		<0.5	<9.5		<0.5
Vinyl Ch bride	soo-	⌈la/ i-	<0.2	<0.2	.0.2	<0.2		.0.2	.0.2		.0.2
UNIONIZED	0.02	rrel	0.0135	0.0060	0.0149	0.0132		0.0099	0.0515	0.0152	0.0159

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Table 5: Prior to Discharge Effluent Holding Pond I

Parameter	PWQO	Un ks	East Pond 1-Dec-16	East Pond 13-Dec-16	West Pond 28-Dec-16
			22-16	n.am ple	23-16
			comp	comp	comp
r	9.9 tO	pH	8	8	7.5
Temperature		'C	10.2	9.1	5.3
DO	4	nxilL	10.36	9.42	10.9
Condudimiy(re		uS,Acm	6480	6691	6940
alkalinity		rrriel_	360		254
CBOD5	10	m/ L	J.		2
COO		mg/ L	301		314
Chloride		real	876		914
Conductivity		L.E,krn	7470		6800
DOC		rug&	101		99
N-NH3	1	ro:IL	<0.25		0.944
NO2		rna/L	<0.10		<0.10
NO3		rrriel_	290		294
Phenols	0.00s	,,,'ı	0.007	0.001	0.001
Sulphate		rrrieL	632		629
TDS		rrrieL	5600		5100
TKN		mg&	11.5		44.9
TP	0.3	ritgiL	0.09		0.10
TSS	10	rngiL	3		5
CA		mgel_	97		70
Magnesium		mgeL	131		141
Potassium		rrrylL	366		370
Sodium		rrrieL	1349		1220
BA		mgel_	0.3		0.3
Boron	0200	r4ı	8.2		8.5
Cadmium	0.9002	rrel	<0.091		<0.001
Chromium	0.0089	mall	0.02		0.02
Copper	1	rug&	<0.01		<0.01
FE	1	malL	<0.3		<0.3
LEAD	0.025	mgeL	<0.01		<0.01
Manganese		rrrieL	<0.1		<0.1
Mercury	5ı01302	mg¨/	<0.0001		<0.0001
ZINC	02	rrryiL	<0.1		<0.1
1,4-dh h brobe	4	pgeL	.0.4		.0.4
Benzene	100	ₖiL	.0.5		.0.5
DICHLOROMET	100	41	<4.0		<4.0
TOLUENE	0 8.ˋ	pall_	<9.5		<0.5
Vinyl Ch bride	soo-	⌈la/ i-	.0.2		.0.2
UNIONIZED	0.02	rrel	<0.0088		0.0115

Discharge approximately once a month

Table XX summarizes the Effluent During Discharge Monitoring analytical results obtained in compliance with Condition 8(2) of the CofA.

Parameter	PWQO	Units	06-Apr-17	21-Apr-17	12-May-17	26-May-17	08-Jun-17	22-Jun-17	10-Jul-17	24-Jul-17	02-Aug-17	15-Aug-17	21-Aug-17	03-Sep-17	14-Sep-17	21-Sep-17	03-Oct-17	12-Oct-17	23-Oct-17	31-Oct-17	15-Nov-17
			Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl
			05-17	06-17	07-17	08-17	09-17	10-17	11-17	12-17	13-17	14-17	15-17	16-17	17-17	18-17	19-17	20-17	21-17	22-17	23-17
pH (field)	6.5 to 8.5	pH	7.9	7.9	8.23	7.53	7.8	8.3	8.00	8.1	8.2	7.6	8.1	7.86	8.06	8.23	8.1	8.2	7.9	8.2	7.96
Temperature (field)		°C	5.8	10.4	12.3	14.9	21.4	23.2	21.3	20.7	28.6	25.3	24.8	18.3	20.8	22.5	16.7	16.5	14.93	11.7	3.8
Dissolved (	4	mg/L	10.09	11.31	9.77	6.15	12.01	8.63	9.74	8.98	12.19	19.19	13.48	11.21	6.61	12.00	7.11	10.29	10.9	9.71	11.26
Conductivity (field)		uS/cm	3350	5490	3553	5176	5138	5409	4980	5120	5180	4843	5036	5060	5047	5086	5330	5340	5365	5080	5326
Alkalinity as CaCO3		mg/L	172	127	281	242	392	305	251	263	252	201	385	351	395	427	611	546	714	684	519
CBOD	10	mg/L	<1	2	<1	3	<1	1	1	< 3	<3	<3	< 3	< 3	< 3	< 3	4	< 3	< 3	< 3	< 3
COD		mg/L	126	130	117	229	262	243	220	207	201	187	189	193	179	206	232	335	1070	250	221
Chloride		mg/L	49	586	427	668	660	713	650	517	570	504	586	578	581	618	664	639	649	628	535
Conductivity		uS/cm	3770	4710	3740	5360	5600	5710	5390	5480	5520	5050	5510	5480	5400	5460	5590	5580	5700	5270	5460
Dissolved Organic Carbo		mg/L	50.5	59.3	46.9	66.2	78.2	78.4	64.4	33.6	54.8	50.3	53.8	26	48	51.8	58.4	61.4	28.2	60.3	18.3
N-NH3 (Am	1	mg/L	1.19	0.06	0.27	1.68	0.50	0.32	0.21	0.1	0.3	0.2	0.04	0.1	0.45	0.1	0.27	0.04	0.16	0.26	0.01
N-NO2 (Nitrite)		mg/L	<10	<0.10	0.10	<10	27.3	<10	<0.10	< 1	<1	<1	< 1	2.1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)		mg/L	179	237	167	232	245	238	256	249	260	229	237	199	167	157	150	143	149	136	129
Phenols	0.005	mg/L	<0.001	0.005	<0.001	<0.001	0.004	0.003	0.002	0.002	<0.001	<001	0.002	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate		mg/L	31	471	279	570	562	632	570	463	517	499	459	568	563	615	610	585	495	377	447
Total Dissolved Solids		mg/L	2450	3300	2430	3480	3640	3710	4040	3350	3590	3428	3614	3537	3466	3477	3571	3582	3559	3296	2994
Total Kjeldahl Nitrogen		mg/L	5.4	4.8	8.0	9.5	11.8	8.9	6.1	8.68	8.20	8.10	8.7	7.02	7.95	8.04	7.9	10.6	11.1	10.4	9.3
Total Phosp	0.3	mg/L	0.05	0.06	0.10	0.19	0.11	0.13	0.11	0.09	0.09	0.16	0.12	0.1	0.09	0.09	0.11	0.13	0.14	0.11	0.11
Total Suspe	10	mg/L	<2	9	3	8	<2	5	10	6	7	6	4	16	13	24	7	< 3	< 3	4	5
Calcium		mg/L	41	52	51	87	120	124	131	76.5	102.0	869.8	110	97.5	91.2	85.3	88.9	108	97.2	64.5	86.2
Magnesium		mg/L	60	76	60	100	98	92	102	72.1	82.0	87.4	88.3	90.7	94.7	95	95.4	107	101	99.9	97.7
Potassium		mg/L	172	219	164	270	261	261	294	188	221	259	266	272	280	280	276	293	284	283	261
Sodium		mg/L	613	756	659	947	972	886	994	776	795	856	822	830	822	831	804	888	844	832	683
Barium		mg/L	0.2	0.30	0.2	0.2	0.2	0.3	0.2	0.128	0.186	0.157	0.146	0.149	0.139	0.137	0.122	0.136	0.099	0.057	0.088
Boron	0.200	mg/L	4.8	3.0	4.1	6.3	6.8	7.3	6.5	4.42	5.24	6.23	6.14	6.34	6.59	6.52	6.35	7.17	6.7	6.53	5.85
Cadmium	0.0002	mg/L	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.000070	< 0.000070	0	0.00014	0.000053	0.000028	< 0.000070	< 0.000070	0.000105	< 0.000070	< 0.000070	0.000215
Chromium	0.0089	mg/L	<0.01	0.009	<0.01	0.01	0.02	0.02	0.010	0.012	0.011	0.012	0.015	0.01	0.012	0.014	0.014	0.013	0.016	0.014	< 0.001
Copper	1	mg/L	<0.01	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	0.0069	0.0080	0.0170	0.0141	0.0085	0.0072	0.0109	0.0092	0.018	0.012	0.0046	< 0.0005
Iron	1	mg/L	<0.3	0.04	<0.3	<0.3	<0.3	<0.3	<0.3	0.013	0.087	0.018	0.02	0.01	0.039	0.041	0.058	0.078	0.079	0.071	0.068
Lead	0.025	mg/L	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.0001	<0.0001	<0.0001	0.0004	0.00009	0.00007	< 0.0001	0.0001	0.0004	0.0003	< 0.0001	0.0006
Manganese		mg/L	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	0.001	0.014	0.003	< 0.001	0.002	0.212	0.004	0.004	0.002	0.001	0.002	0.001
Mercury	0.0002	mg/L	<0.0001	<0.0001	0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.00006	0.00004	0.00005	0.00008	0.00002	< 0.00002	0.00003	< 0.00002	0.00004	< 0.00002	0.00002	< 0.00002
Zinc	0.2	mg/L	<0.1	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	0.024	0.093	0.044	0.044	0.057	0.052	0.054	0.054	0.053	0.05	0.07	0.052
1,4-dichloro	4	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	100	µg/L	<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	0.6	< 0.5	0.9	< 0.5	2.7	< 0.5
Dichlorome	100	µg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Toluene	0.8**	µg/L	<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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chlorid	600**	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0151	0.0011	0.0119	0.0186	0.0163	0.0352	0.0106	0.0061	0.0352	0.0049	0.0032	0.0030	0.0251	0.0091	0.0123	0.0022	0.0041	0.0103	0.0001

--- Not Analysed

Red CofA Limit

Blue PWQO

Discharge approximately once a

Table XX summarizes the Efflu

Parameter	PWQO	Units	22-Nov-17 Effl 24-17	02-Dec-17 Effl 25-17	08-Dec-17 Effl 26-17	17-Dec-17 **27-17 comp**	**comp**
pH (field)	6.5 to 8.5	pH	7.80	7.56	8.16	7.73	
Temperature (field)		°C	2.1	4.87	2.77	1.3	
Dissolved	4	mg/L	12.73	11.96	11.8	11.16	
Conductivity (field)		uS/cm	5813	5776	5940	6253	
Alkalinity as CaCO3		mg/L	228	202	182	146	
CBOD	10	mg/L	< 3	< 3	< 3	< 3	
COD		mg/L	200	213	230	226	
Chloride		mg/L	655	701	693	674	
Conductivity		uS/cm	5970	5600	5900	4780	
Dissolved Organic Carbo		mg/L	16.4	81.7	51.3	18.1	
N-NH3 (Am	1	mg/L	0.19	**0.01**	**0.01**	0.03	
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	< 1	
N-NO3 (Nitrate)		mg/L	158	170	180	184	
Phenols	0.005	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	
Sulphate		mg/L	864	868	863	936	
Total Dissolved Solids		mg/L	3649	3648	3841	3865	
Total Kjeldahl Nitrogen		mg/L	8.2	10.5	10.5	10.8	
Total Phosp	0.3	mg/L	0.07	0.11	0.1	0.12	
Total Suspe	10	mg/L	7	4	6	3	
Calcium		mg/L	117	106	115	137	
Magnesium		mg/L	112	101	113	115	
Potassium		mg/L	279	267	305	297	
Sodium		mg/L	784	731	847	803	
Barium		mg/L	0.174	0.175	0.203	0.25	
Boron	0.200	mg/L	6.29	5.72	6.62	6.45	
Cadmium	0.0002	mg/L	0.00013	0.000031	0.000095	0.000075	
Chromium	0.0089	mg/L	0.012	0.011	0.016	0.015	
Copper	1	mg/L	0.0153	0.0071	0.0087	0.0099	
Iron	1	mg/L	0.048	0.074	0.104	0.12	
Lead	0.025	mg/L	0.0005	0.00012	0.0003	0.0004	
Manganese		mg/L	0.01	0.014	0.019	0.024	
Mercury	0.0002	mg/L	< 0.00002	< 0.00002	< 0.00002	0.00003	
Zinc	0.2	mg/L	0.052	0.063	0.085	0.087	
1,4-dichloro	4	µg/L	< 0.2	< 0.2	< 0.2	< 0.2	
Benzene	100	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	
Dichloromet	100	µg/L	< 0.3	< 0.3	< 0.3	< 0.3	
Toluene	0.8**	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	
Vinyl Chlorid	600**	µg/L	< 0.2	< 0.2	< 0.2	< 0.2	
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0014	0.0001	0.0002	0.0002	0.0000

--- Not Analysed

Red CofA Limit

Blue PWQO

Discharge approximately once a month

Table XX summarizes the Effluent During Discharge Monitoring analytical results obtained in compliance with Condition 8(2) of the CofA.

aramete	PWQO	Units	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl
harge Event			**28-17**	**01-18**	**02-18**	**03-18**	**04-18**	**05-18**	**06-18**	**07-18**	**08-18**	**09-18**	**10-18**	**11-18**	**12-18**	**13-18**	**14-18**	**15-18**	**16-18**	**17-18**	**18-18**	**19-18**	**20-18**	**21-18**	**22-18**	**23-18**
pH (field	6.5 to 8.5	pH	7.4	8	7.18	7.61	7.41	8.16	8.30	7.71	8.26	8.12	8.4	7.89	7.77	7.86	7.93	7.7	8.01	7.99	7.99	7.82	7.85	7.74	7.97	8.07
Temperature (field		°C	1.2	0.2	4.1	2.1	0.9	2.1	3.2	6.1	7.3	7.1	14	10.9	15.1	18.8	20.6	20.1	25.4	27.4	23.4	24.8	26.2	25.4	28	23.3
Dissolved	4	mg/L	10.69	12.57	11.45	11.52	11.75	11.11	11.6	11.42	11.52	11.42	11.78	16.83	12.89	11.76	8.14	10.07	10.53	9.19	10.02	10.03	11.6	9.79	9.21	9.77
Conductivity (field		uS/cm	6990	6580	5580	5660	5660	4570	5060	4930	5250	4600	4520	5100	5280	5830	5760	5200	5240	5220	5460	5620	5500	5690	5820	5790
Alkalinity as CaCO		mg/L	177	246	254	189	189	175	168	204	222	233	201	192	190	161	182	329	384	492	524	508	591	644	595	415
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	227	246	223	249	249	196	234	223	261	231	209	220	207	196	216	105	182	232	247	237	316	259	270	243
Chloride		mg/L	692	659	625	650	650	554	610	570	619	704	533	619	811	742	813	830	840	806	890	1010	905	942	948	970
Conductivity		uS/cm	6050	5740	5490	5820	5820	4780	5000	4750	5250	5110	4720	5340	5500	6120	6190	5840	5830	5910	6090	6360	6270	6400	6600	6590
Dissolved Organic		mg/L	51.6	20.8	50.9	58.6	58.6	52.9	59.2	57.3	65.9	53.6	57.7	51	0	72.1	58.6	55.8	23.4	62.0	2.0	56.0	67.6	63.7	9.8	50
N-NH3 (A	1	mg/L	0.31	< 1	0.20	0.31	0.31	0.22	0.29	0.3	0.3	0.3	0.25	0.1	< 1	0.2	0.29	0.21	0.22	0.27	0.21	0.26	0.28	**0.42**	0.33	0.320
N-NO2 (Nitrite)		mg/L	< 1	215	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	283	< 1	< 1	< 1	< 2	< 5	< 10	< 2	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)		mg/L	206	< 0.001	211	247	247	212	242	229	247	241	216	265	< 0.001	286	264	220	175	148	145	150	135	160	193	214
Phenols	0.005	mg/L	< 0.001	694.000	< 0.001	0.002	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	562.000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.037	0	0.016	0.011	0.015	0.022
Sulphate		mg/L	884	3898	601	585	585	438	419	348	353	374	337	407	4035	707	938	799	857	819	943	1120	931	835	790	929
Total Dissolved So		mg/L	3937	12	3582	3745	3745	3128	3366	3193	3467	3430	3103	3562	2	4104	4634	4166	4089	3962	4311	4631	4313	4550	4680	4642
Total Kjeldahl Nitr		mg/L	10.3	0.1	11.7	12.1	12.1	10.7	10.7	10.60	10.60	10.70	9.4	11.10	0.17	6.90	9.4	9.7	10.3	15.6	11.1	12.0	10.7	16.1	13.1	11.40
Total Phc	0.3	mg/L	0.09	6.00	0.13	0.11	0.11	0.11	0.12	0.13	0.14	0.12	0.10	0.13		0.10	0.10	0.10	0.09	0.11	0.09	0.14	0.12	0.1	0.14	0.090
Total Sus	10	mg/L	6	134	5	< 3	< 3	6	5	6	8	3	6	6	9.00	< 3	5	3	6	9	10	10	6	8	6	4
Calcium		mg/L	138	120	121	108	108	67	67	60.4	62.2	58.1	67	80.4	6	188.0	229.0	119	112.0	122.0	119.0	152	145	153	162	139
Magnesium		mg/L	113	310	108	116	116	92	100	94.6	110.0	101.0	96.5	108.0	0.00007	111	127.0	112	120	113.0	121.0	130	129	141	143	118
Potassium		mg/L	286	881	277	296	296	236	262	254	277	265	256	271	0.0	285	311	273	283	281	304	315	312	353	354	317
Sodium		mg/L	804	0	762	781	781	697	735	726	818	719	734	789	0	707	935	861	871	870	976	930	939	1030	1070	973
Barium		mg/L	0.232	6.67	0.2	0.3	0.3	0.2	0.2	0.204	0.222	0.230	0.211	0.267	0	0.432	0.407	0.235	0.186	0.225	0.209	0.254	0.202	0.231	0.244	0.2
Boron	0.200	mg/L	6.2	0.0	5.8	6.5	6.5	5.1	5.6	5.38	6.29	5.62	5.32	5.61	5.550	5.46	5.73	5.44	5.5	5.51	5.84	6.17	6.08	6.41	6.76	6.0
Cadmium	0.0002	mg/L	4E-05	0.02	0	0	0	0	0	0	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0	#####	0	0.00007	0.00007	0.00007	#####	0.00007	< 0.000070	0
Chromiu	0.0089	mg/L	0.014	0.006	0.02	0.02	0.02	0.01	0.015	0.013	0.020	0.019	0.017	0.02	######	0.015	0.014	0.017	0.015	0.016	0.02	0.017	0.017	0.018	0.018	0.01
Copper	1	mg/L	0.0042	0.192	0.009	0.005	0.005	0	0.006	0.0059	0.0039	0.0036	0.0061	0.0119	0.004	0.0059	0.0094	0.009	0.008	0.0071	0	0.0024	0.0649	0.0033	0.0131	0.01
Iron	1	mg/L	0.128	0.00	0.17	0.19	0.2	0	0.15	0.151	0.153	0.151	0.13	0.138	0.1090	0.108	0.065	0.064	0.087	0.074	0.063	0.067	0.069	0.069	0.09	0.1
Lead	0.025	mg/L	0.0001	0	0.000	0.000	0	0	0	0.000	0.001	0.001	0.0004	0.0004	0.000	0	0.0004	0.0002	0.0001	< 0.0001	< 0.0001	0.0001	0.01620	0.0001	0.0044	0
Manganese		mg/L	0.02	0	0.01	0.02	0.02	0	0	0.022	0.006	0.010	0	0.025	< 0.00002	0.032	0.037	0.007	0.008	0.002	0.004	0.00	0.003	0.002	0.006	0
Mercury	0.0002	mg/L	2E-05	0.1220	0.0000	0.0000	0.0000	0	0.0000	0.00004	0.00002	< 0.00002	< 0.00001	0.00003	< 0.2	< 0.00002	0.0001	< 0.00001	0.0001	< 0.00002	0.0000	0.000	< 0.00001	< 0.00001	< 0.00002	0.0001
Zinc	0.2	mg/L	0.086	< 0.2	0.12	0.11	0.11	0	0.12	0.099	0.113	0.116	0.103	0.117	1.900	0.134	0.124	0.098	0.13	0.09	0.074	0.077	0.098	0.077	0.094	0.16
1,4-dichl	4	µg/L	< 0.2	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	100	µg/L	< 0.5	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5	0.8	< 0.5	< 0.5	< 0.5	0.8	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5
Dichloror	100	µg/L	< 0.3	< 0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Toluene	0.8**	µg/L	< 0.5	< 0.2	< 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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chl	600**	µg/L	< 0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0009	#####	0.0004	0.0015	0.0009	0.0037	0.0074	0.0021	0.0094	0.0058	0.0181	0.0013	#####	0.0071	0.0120	0.0050	0.0151	0.0202	0.0120	0.0113	0.0142	0.0159	0.0246	0.0217

--- Not Analysed

Red CofA Limit

Blue PWQO

Discharge approximately on
Table XX summarizes the Ef

aramete	PWQO	Units	Effl	Effl					Effl
harge Event			24-18	25-18					26-18
pH (field	6.5 to 8.5	pH	7.98	8					7.86
Temperature (field		°C	24.5	21.9					16.4
Dissolved	4	mg/L	12.58	9.45					11.32
Conductivity (field		uS/cm	5880	5870					5920
Alkalinity as CaCO		mg/L	343	363					
CBOD	10	mg/L	< 3	< 3					
COD		mg/L	248	236					
Chloride		mg/L	915	918					
Conductivity		uS/cm	6750	6580					
Dissolved Organic		mg/L	49.8	55.3					
N-NH3 (A	1	mg/L	0.21	0.20					
N-NO2 (Nitrite)		mg/L	< 1	< 1					
N-NO3 (Nitrate)		mg/L	234	247					
Phenols	0.005	mg/L	0.027	0.025					
Sulphate		mg/L	893	787					
Total Dissolved So		mg/L	4636	4665					
Total Kjeldahl Nitr		mg/L	11	10.6					
Total Phc	0.3	mg/L	0.12	0.09					
Total Sus	10	mg/L	10	9					
Calcium		mg/L	145	149					
Magnesium		mg/L	128	129					
Potassium		mg/L	332	340					
Sodium		mg/L	976	1030					
Barium		mg/L	0.258	0.27					
Boron	0.200	mg/L	6.42	6.6					
Cadmium	0.0002	mg/L	0.00007	0.000070					
Chromiu	0.0089	mg/L	0.014	0.014					
Copper	1	mg/L	0.0037	0.004					
Iron	1	mg/L	0.051	0.06					
Lead	0.025	mg/L	0.0001	0					
Manganese		mg/L	0.007	0					
Mercury	0.0002	mg/L	4E-05	< 0.00002					
Zinc	0.2	mg/L	0.198	0.08					
1,4-dichl	4	µg/L	< 0.2	<0.5					
Benzene	100	µg/L	< 0.5	<0.5					
Dichloror	100	µg/L	< 0.3	<0.5					
Toluene	0.8**	µg/L	< 0.5	<0.5					
Vinyl Chl	600**	µg/L	< 0.2	<0.5					
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L							

--- Not Analysed

Red CofA Limit

Blue PWQO

Discharge approximately once a month

Table XX summarizes the Effluent During Discharge Monitoring analytical results obtained in compliance with Condition 8(2) of the CofA.

Parameter	PWQO	Units	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl
Discharge Event			**01-19**	**02-19**	**03-19**	**04-19**	**05-19**	**06-19**	**07-19**	**08-19**	**09-19**	**10-19**	**11-19**	**08/23**	**08/27**	**08/30**	**09/03**	**09/06**	**09/10**	**Oct-15**	**Oct-18**	**Oct-22**	**Oct-25**	**Oct-29**	**Oct-31**
pH (field)	6.5 to 8.5	pH	7.38	7.11	7.42	7.38	7.44	8.06	8.28	7.93	7.83	8.11		8.3	8.4	8.41	8.4	8.39	8.10	8.4	8.33	8.12	8.13	8.37	8.42
Temperature (field)		°C	3.1	3.8	4.7	4.8	7.0	10.6	23.2	17.7	17.1	27		27.2	22.3	20.3	20.2	19.1	17.9	11.9	9	11.7	9.8	9.1	11.5
Dissolved Oxygen (	4	mg/L	17.9	12.67	16.65	16.02	12.95	12.6	9.12	7.93	9.87	12.57													
Conductivity (field)		uS/cm	6280	6340	6060	6250	6010	5220	5040	5210	5470	5230													
Alkalinity as CaCO3		mg/L	163	224	178	126	125	144	188	233	170	210	292	303	303	298	229	313	389	432	374	349	313	333	380
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	5	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	245	209	285	164	141	138	155	153	121	163	193	165	151	154	138	64	122	181	192	159	126	147	136
Chloride		mg/L	838	685	931	498	439	460	544	457	527	608	737	640	774	826	645	361	877	784	672	646	546	491	538
Conductivity		uS/cm	6500	5020	6180	3720	3270	3510	3930	3750	4070	4920	6130	5560	5240	5160	4630	2520	4680	5890	5100	4770	4290	4210	4510
Dissolved Organic Carbon		mg/L	47	49.3	56.4	40.3	37.5	36.8	46.8	28.9	24	20	49.7	18.6	39.0	16.1	16.2	12.1	35.6	11	61.5	10.1	33.7	41.1	45.8
N-NH3 (Ammonia)	1	mg/L	0.690	0.56	0.36	0.38	0.5	0.2	0.3	0.63	0.3	0.37	0.3	0.31	0.20	0.28	0.27	0.10	0.18	0.26	0.23	0.22	0.19	0.370	0.33
N-NO2 (Nitrite)		mg/L	4.70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.1	< 1	< 0.1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)		mg/L	344	257	378	212	187	185	204	187	224	249	< 1	213	210	255	200	51	180	287	250	249	203	185	173
Phenols	0.005	mg/L	0.109	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.002
Sulphate		mg/L	294	207	297	178	144	158	232	224	411	529	763	708	675	707	551	248	436	418	359	371	332	348	387
Total Dissolved Solids		mg/L	4161	3252	4473	2465	2212	2245	2828	2547	2964	3540	3160	3862	3786	4106	3311	1531	3443	4002	3567	3406	2758.0	2791	2933
Total Kjeldahl Nitrogen		mg/L	10.30	9.1	9.7	6.2	1.50	6.30	7.00	8.2	7.20	7.60	8.60	6.1	4.7	4.3	6.1	3.2	5.5	7.30	6.4	6.8	4.40	5.50	6.1
Total Phosphorus	0.3	mg/L	0.090	0.25	0.31	0.08	0.05	0.07	0.11	0.23	0.06	0.08	0.08	0.07	0.09	0.06	0.11	0.05	0.10	0.03	0.09	0.07	0	0.05	0.07
Total Suspended S	10	mg/L	4	5	17	5	< 3	< 3	6	6	< 3	4.00	7	13	< 3	4	7	6	6	7	12	3	11	7	8
Calcium		mg/L	60	44	55	26	26.4	23.6	48.3	69	87.0	121	124.0	102.0	77	66.1	75.7	22.4	64	90	90.9	81.7	100	73	75.8
Magnesium		mg/L	125	89.7	118	71	65.3	64.0	89.1	71.1	68.9	87.3	110	103.0	100	97	79.8	41.9	78	100.0	94.7	81.5	70	80	81.6
Potassium		mg/L	316	243	321	178	157	163	214	178	172	213.0	276	255	240	249	209	93	201	253	242	213	160	191	193
Sodium		mg/L	891	710	969	498	478	472	686	579	604	752	973	928	809	851	725	351	757	826.000	778	700	463.000	587	663
Barium		mg/L	0.4	0.361	0.34	0.2	0.211	0.196	0.272	0.224	0.243	0	0.234	0.192	0.155	0.148	0.142	0.061	0.110	0.14	0.139	0.156	0.16	0	0.151
Boron	0.200	mg/L	6.4	4.89	6.4	3.5	3.19	3.17	4.19	3.68	3.47	4.420	5.89	5.41	5.17	4.9	4.25	2.16	4.02	#####	4.43	3.88	#####	3.5	3.76
Cadmium	0.0002	mg/L	< 0.00007	0.0001	< 0.00007	< 0.00007	0.00007	< 0.00007	< 0.00007	0.00007	0.00007	< 0.00007	< 0.00007	< 0.00007	0.00007	< 0.00007	< 0.00007	< 0.00007	< 0.00007	0.00007	< 0.00007	0.00007	< 0.00007	< 0.00007	< 0.00007
Chromium	0.0089	mg/L	0.02	0.089	0.020	0.014	0.011	0.012	0.013	0.011	0.01	######	0.010	0.008	0.007	0.006	0.007	0.00	0.008	0.01	0.009	0.01	0.0070	0.01	0.009
Copper	1	mg/L	0.01	0.0358	0.005	0.005	0.0086	0.0020	0.0058	0.0020	0.0018	0.003	0.0036	0.0035	0.006	0.007	0.0026	0	0.0068	0.003	0.0078	0.0072	0.004	0.01	0.0106
Iron	1	mg/L	0.1	0.139	0.20	0.12	0.134	0.084	0.129	0.07	0.052	0.0280	0.027	0.036	0.042	0.006	0.014	0.018	0.030	0.04400	0.04	0.05	0.07200	0	< 0.005
Lead	0.025	mg/L	0	0.0016	0	0	0.001	< 0.0001	0.000	0.0001	< 0.0001	0.000	< 0.0001	< 0.0001	0.0001	< 0.0001	0	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	0.000	< 0.0001	0.0001
Manganese		mg/L	0	0.014	0	0	0.007	0.005	0.003	0	0.013	0.00700	0.011	0.010	0.004	0.002	0.005	< 0.001	0.00	0.0020	0.002	0.003	0.0100	< 0.001	< 0.001
Mercury	0.0002	mg/L	< 0.00001	< 0.00002	0.0000	< 0.00002	0.00009	< 0.00002	0.00004	< 0.00002	< 0.00002	0.0000	< 0.00002	< 0.00002	< 0.00002	0.0000	< 0.00002	< 0.00002	0.000	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0002
Zinc	0.2	mg/L	0.11	0.068	0.10	0.06	0.060	0.060	0.062	0.057	0.068	0.092	0.067	0.055	0.028	0.04	0.05	0.021	0.061	0	0.057	0.049	0	0	0.047
1,4-dichlorobenzen	4	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	2	< 0.5	1	< 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
Benzene	100	µg/L	< 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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	100	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	0.8**	µg/L	< 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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	600**	µg/L	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0021	0.0010	0.0014	0.0014	0.0022	0.0061	0.0338	0.0212	0.0080	0.0349	0.0000	0.0439	0.0255	0.0320	0.0301	0.0101	0.0090	0.0162	0.0099	0.0073	0.0056	0.0175	0.0209

--- Not Analysed

Red CofA Limit

Blue PWQO

Discharge approximately once a mont
Table XX summarizes the Effluent Dur

Parameter	PWQO	Units	Effl	Effl	Effl	Effl		Effl	Effl	Effl
Discharge Event			**16-19**	**17-19**	**18-19**	**21-19**		**19-19**	**20-19**	**21-19**
pH (field)	6.5 to 8.5	pH	8.06	8.06	7.11			7.92	7.88	7.89
Temperature (field)		°C	8.1	2.3	5.6			7.9	5.1	1.2
Dissolved Oxygen (	4	mg/L	11.89	12.5	10.63			12.05	11.43	11.43
Conductivity (field)		uS/cm	5840	6210	6720			6810	6640	7120
Alkalinity as CaCO3		mg/L	298	273	292	228		304	228	228
CBOD	10	mg/L	< 3	< 3	< 3	< 3		< 3	< 3	< 3
COD		mg/L	171	155	170	211		243	211	211
Chloride		mg/L	669	603	591	620		914	620	620
Conductivity		uS/cm	4960	4630	4900	4940		6890	4940	4940
Dissolved Organic Carbon		mg/L	55	< 0.2	50.5	50.7		52.3	50.7	50.7
N-NH3 (Ammonia)	1	mg/L	0.21	0.22	0.18	0.17		0.26	0.170	0.17
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 0.1	2.500		< 1	3	2.5
N-NO3 (Nitrate)		mg/L	241	231	233	294		338	294	294
Phenols	0.005	mg/L	< 0.002	0.002	< 0.002	< 0.002		< 0.002	< 0.002	< 0.002
Sulphate		mg/L	398	377	364	189		457	189	189
Total Dissolved Solids		mg/L	3441	3209	3211	3285		4607	3285	3285
Total Kjeldahl Nitrogen		mg/L	6.80	6.8	8.2	9		11.1	9.00	9
Total Phosphorus	0.3	mg/L	0.07	0.07	0.12	0.08		0.22	0.08	0.08
Total Suspended S	10	mg/L	8	< 3	14	< 3		5	< 3	< 3
Calcium		mg/L	110	102	112	71.4		151	71	71.4
Magnesium		mg/L	98.8	87.3	90.3	91.6		131	92	91.6
Potassium		mg/L	229	204	215	211		314	211	211
Sodium		mg/L	690	648	630	655		961	655	655
Barium		mg/L	0.190	0.189	0.242	0.228		0.366	0	0.228
Boron	0.200	mg/L	4.21	3.86	3.6	3.95		5.56	4.0	3.95
Cadmium	0.0002	mg/L	< 0.00007	< 0.00007	0.00007	< 0.000070		< 0.00007	0.00007	0.00007
Chromium	0.0089	mg/L	0.012	0.01	0.012	0.016		0.019	0.02	0.016
Copper	1	mg/L	0.00	0.0029	0.002	0.0053		0.0026	0.01	0.0053
Iron	1	mg/L	0.059	0.062	0.059	0.112		0.143	0	0.112
Lead	0.025	mg/L	< 0.0001	< 0.0001	0.0001	0.0001		0.00010	0	0.0001
Manganese		mg/L	0.008	0.006	0.004	0.007		0.013	0	0.007
Mercury	0.0002	mg/L	0.0000	3E-05	< 0.00002	< 0.00002		0.0000	< 0.00002	< 0.00002
Zinc	0.2	mg/L	0.08	0.08	0.084	0.083		0.094	0	0.083
1,4-dichlorobenzen	4	µg/L	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Benzene	100	µg/L	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Dichloromethane	100	µg/L	< 0.7	< 5	< 5	< 5		< 5	< 5	< 5
Toluene	0.8**	µg/L	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Vinyl Chloride	600**	µg/L	< 0.2	< 0.2	< 0.2	< 0.2		< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0046	0.0030	0.0004	0.0000	0.0000	0.0000	0.0000	0.0041	0.0019	0.0015

--- Not Analysed
Red CofA Limit
Blue PWQO

Table XX summarizes the Effluent During Discharge Monitoring analytical results obtained in compliance with Condition 8(2) of the CofA.

arameter	PWQO	Units	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl	Effl
harge Event			West	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
			22-19	1	2	3	4	5	6	7	8	9	10	11	18	19	20	21	22
pH (field	6.5 to 8.5	pH	7.7	7.5	7.12	7.15	8.39	8.41	7.72	8.05	8.01	8.01	7.87	8.29	8.08	8.02	7.76	7.6	7.08
Temperature (field		°C	3	6.5	4.4	3.3	2.9	6.6	7.8	11.4	7.9	7.9	9	16.5	6.1	13.5	5.2	2.9	2.5
Dissolved	4	mg/L	10.4	12.64	11.91	12.56	16.02	12.83	12.77	12.75	11.97	11.97	10.06	15.59	11.07	11.99	12.36	13.33	10.65
Conductivity (field		uS/cm	6600	5840	5890	6130	5940	5890	5040	4520	5120	5120	4890	5150	4850	4740	5930	6380	6260
Alkalinity as CaCO		mg/L	177	268	145	86	125	170	134	161	184	214	241	311	279	291	222	144	85
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	206	171	262	165	176	148	141	141	141	76	134	142	126	168	188	177	150
Chloride		mg/L	678	709	906	599	567	507	466	487	497	342	453	441	570	684	649	629	738
Conductivity		uS/cm	4940	5170	6240	4390	4260	3680	3560	3800	3790	2690	3520	3430	4480	4860	5140	5040	5370
Dissolved Organic		mg/L	58.2	54.7	60.3	50	49.0	37.8	36.9	34.5	26.3	26.5	33.9	34	34	30.9	47.5	49.7	51.9
N-NH3 (A	1	mg/L	0.24	0.25	0.46	0.22	0.22	0.26	0.26	0.2	0.2	0.1	0.22	0.2	0.25	0.1	0.21	0.21	0.24
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)		mg/L	305	274	413	280	270	223	207	205	201	106	161	140	249	300	298	300	331
Phenols	0.005	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate		mg/L	187	281	265	162	165	182	200	222	228	238	245	252	247	256	261	305	319
Total Dissolved So		mg/L	3423	3573	4465	2967	2888	2553	2359	2484	2561	1793	2269	2309	3094	3475	3556	3435	3784
Total Kjeldahl Nitr		mg/L	9.9	6.6	12.4	6.4	6.8	6.8	6.3	6.80	6.10	3.30	4.7	5.40	5.70	6.00	6.3	7.0	9.4
Total Phc	0.3	mg/L	0.09	0.1	0.1	0.06	0.06	0.05	0.07	0.06	0.08	0.03	0.06	0.06	0.08	0.08	0.10	0.09	0.08
Total Sus	10	mg/L	3	4	4	3	3	4	< 3	4	< 3	4	3	< 3	< 3	3	3	4	5
Calcium		mg/L	62.5	84.7	60.5	32.1	34	30	24	29.4	28.9	39.3	33	43.2	86	94.0	111.0	104	98.2
Magnesium		mg/L	89.5	103	117	73.8	75	67	59	64.6	67.6	55.0	60.3	74.2	76.4	85	98.3	93	101
Potassium		mg/L	226	214	307	191	186	167	154	174	176	119	158	180	200.0	212	252	233	262
Sodium		mg/L	720	808	888	614	591	503	457	502	561	401	462	514	642	640	732	656	749
Barium		mg/L	0.286	0.187	0.39	0.268	0.3	0.2	0.2	0.206	0.196	0.121	0.151	0.135	0	0.156	0.247	0.298	0.359
Boron	0.200	mg/L	4.4	4.15	6.15	4.11	4.0	3.6	3.1	3.56	3.43	2.34	2.93	3.37	3.790	3.99	4.35	3.89	4.1
Cadmium	0.0002	mg/L	0.0001	0.000088	< 0.000070	< 0.000070	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	< 0.00014	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Chromiur	0.0089	mg/L	0.016	0.01	0.03	0.012	0.01	0.01	0.009	0.010	0.011	0.005	0.009	0.01	######	0.012	0.015	0.014	0.014
Copper	1	mg/L	0.0019	0.0043	0.0073	0.002	0.006	0	0.001	0.0017	0.0010	0.0049	0.0016	0.0042	0.004	0.0032	0.0025	0.002	0.002
Iron	1	mg/L	0.127	0.051	0.124	0.061	0.1	0	0.06	0.055	0.068	0.052	0.05	0.036	0.0240	0.051	0.074	0.079	0.069
Lead	0.025	mg/L	0.0004	0.0028	0.0001	0.0001	< 0.0001	0	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0002	0.0001	0.000	< 0.0001	0.0001	0.0002	0.0001
Manganese		mg/L	0.017	0.023	0.014	0.009	0.01	0	0	0.002	0.005	0.003	0	< 0.001	0.00200	0.002	0.004	0.008	0.008
Mercury	0.0002	mg/L	< 0.00001	0.00004	< 0.00002	< 0.00002	< 0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00001	< 0.00002
Zinc	0.2	mg/L	0.093	0.06	0.081	0.055	0.05	0	0.05	0.041	0.043	0.027	0.039	0.032	0.041	0.071	0.083	0.082	0.08
1,4-dichl	4	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	100	µg/L	< 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	< 0.5	< 0.5	< 0.5	< 0.5
Dichloror	100	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	0.8**	µg/L	< 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	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chl	600**	µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	0.0015	0.0013	0.0009	0.0004	0.0067	0.0111	0.0026	0.0047	0.0035	0.0023	0.0034	0.0130	0.0049	0.0021	0.0018	0.0011	0.0004

--- Not Analysed

Red CofA Limit

Blue PWQO

Part B

2021 Update

GFL Eastern Ontario Waste Handling Facility Expansion - Surface Water Existing Conditions Report – 2021 Update

Prepared for

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CanDetec Inc.

October 2022

Executive Summary

CanDetec Inc. (CanDetec) was contracted by GFL Environmental Inc. (GFL) initially in 2018, to assist with the surface water monitoring program for the existing landfill operation and to develop a monitoring program for characterizing baseline aquatic quality and quantity based on data from 2019 and 2020 for the future expansion of the Eastern Ontario Waste Handling Facility (EOWHF). The proposed 240 ha landfill "expansion site" is immediately to the east of the existing landfill and is bounded by Concession Road 7 to the north, Highway 138 to the east, Laflèche Road to the south, and the Fraser Drain to the west. An Environmental Assessment (EA) study is being completed in support of the proposed landfill expansion. Establishing the existing surface water conditions at the site is required as part of the EA study in order to investigate the potential impacts of the development on the receiving surface drainage systems.

Phase 1 of the existing landfill generates leachate which is recovered and treated on site for discharge to Fraser Drain approximately 600 m upstream of the confluence with Moose Creek. The Phase 2 expansion of the existing landfill will result in the increased production of landfill leachate. The availability of the leachate treatment infrastructure at the existing EOWHF site will be utilized for treatment of leachate from the "expansion site" and consequently, the surface water study area is defined as the Moose Creek and Fraser Drain watersheds as well as the Upper-Tayside drain that feeds into the Scotch River watershed.

Water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow information for the water courses. The initial review of the historical data demonstrated that:

- Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near EOWHF;
- Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any overlap with periodic treated effluent discharge events in Fraser Drain and Moose Creek;
- Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018; and
- Since May 2019, in part in response to the need for baseline condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters and the potential effect of the Phase 2 of the existing landfill, water quality and quantity monitoring in the receiving waters was enhanced in 2019 and continuing through to 2021.

The purpose of this report is therefore to characterize existing conditions of the surface waters with respect to quality in the vicinity of the existing landfill and the expansion site. All sampling locations on Fraser Drain upstream of the effluent discharge location were considered as existing conditions for the period of record of data. Similarly, Moose Creek sites upstream of the confluence with Fraser Drain were considered as existing conditions. The Albert Fahey Award Drain site characterizes existing conditions

typical of peat and natural forested areas. The Upper-Tayside drain typifies current agricultural land uses in the vicinity of the proposed expansion site including sod farming.

Fraser Drain downstream of the effluent discharge location and Moose Creek below the confluence with Fraser Drain were considered in three periods to assess trends or changes as a result of the effluent discharge. These periods are pre-discharge (1996 to 2007), early discharge without an emphasis on alignment with discharge events monitoring (2007 to 2015), discharge following upgrades to the treatment of the effluent but limited sample alignment with discharge events and 2019 through 2021 monitoring intended to be synoptic monitoring with treated effluent discharge events.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in impacts on water quality in these water courses and altered hydrologic regimes which have significantly affected existing conditions vis a vis natural or historic conditions. Historic conditions have not been emphasized in this report with the exception of water quality of the Albert-Fahey Award Drain.

Throughout the study area, existing water quality conditions in the surface waters are generally poor with high concentrations of TP, Fe, NO3-N and un-ionized ammonia. Poor quality is exacerbated by extreme hydrologic conditions (rapid runoff altered by agricultural drainage and the construction of straight, un-natural U-shaped channels) that result in extremely low baseflow or even dry-ditch conditions exclusive of any effects of the current landfill.

General time trends for upstream Fraser Drain stations SWFD4, SWFD3, and SWFD2 for the period of record show increasing concentrations for Cl at all three sampling locations. Otherwise, various analytes showed minor increased concentrations for some of Na, TP, SO4, NH3-N and Fe over the period of monitoring. The high variability over time for concentrations with these samples is likely associated with flow. The data have been sorted into Group A and Group B characterizing the period of sampling from 1996 to May 8, 2019 and from May 23, 2019 to Dec. 3, 2021, respectively. Median concentrations for SWFD4 Group B (2019-05-23 to 2020-12-09) have doubled for B (0.010 for Group A to 0.020 mg/L for Group B), tripled for NO3-N (0.940 to 3.378 mg/L for Group A and B, respectively) and nearly doubled for Cl (18 to 30 mg/L for Group A and B respectively) but showed little change for Cu, Fe, Na, and SO4 and decreased marginally for NH3 -N and TP.

In general, median concentrations for SWFD3 Group B (2019-05-23 to 2021-12-03) have increased noticeably for Cl (18 to 30 mg/L for Group A and B respectively) and for NO3-N (0.97 to 2.27 mg/L for Group A and B, respectively), and SO4 (34.0 to 54.0 for Group A and B, respectively). P-Total increased slightly (0.050 to 0.075 for Group A and B, respectively).

Three stations were selected for evaluation of existing or background conditions in Moose Creek including SWMC1 above the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek and SWMC3 downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1. It was observed that there is little change in quality between SWMC3 and SWMC2 for the comparable data from May 23, 2019 to Dec. 3, 2021. SWMC1 has long term data extending from 2005. Increased concentrations of SO4 are apparent with slight increases over the 16 years of Cl, Na, NO3-N and NH3-N. At SWMC2 (upstream and with data since 2006) all

variables are similar between the two time periods except for B, NO3-N and SO4 which increased post May 23, 2019 while TP was noticeably lower in the latter time period. The patterns noted for NO3-N and TP are not present downstream at SWMC1. Detailed time series plots for key variables for the three Moose Creek background stations indicate that SO4 shows a rising trend both for the past 32 months at SWMC3 and for the past 15 years at SWMC2 and SWMC1. Concentrations of SO4 are now of the order of 50 to 80 mg/L as background. Cl, Na, B, NH3-N and NO3-N all show a slight upward trend over the period of record.

The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables show no trends for the last 32 months. SWAF1 median and 90th percentile water quality statistics were compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain. It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH3-N and TP especially relative to samples from the last 32 months of monitoring. B, Fe and TP are an order of magnitude higher than SWMC2 for the period May 23, 2019 to Dec. 3, 2021. Field observations have indicated that the continuous flow at SWAF1 is largely associated with the peat and natural forested areas which are more representative of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO3-N and SO4 than the Albert-Fahey Award Drain. Median concentrations at SWAF1 exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e. pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert Fahey Award Drain with higher concentrations of B, Fe, Na, NH3-N and TP and lower concentrations of Cl, NO3-N and SO4 than is currently typical of Moose Creek.

Changes in surface water quality (medians for the data from May 23, 2019 to Dec. 3, 2021) at SW1 relative to upstream Moose Creek quality (SWMC2) indicate the effect of the input of Fraser Drain and the treated effluent discharge to Fraser Drain. These effects can be summarized as follows:

- Boron – median increases from 0.050 to 0.750 mg/L;
- Chloride – median increases from 19 to 102 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.480 to 0.610 mg/L;
- Sodium – median increases from 14 to 118 mg/L;
- Ammonia – median is unchanged at 0.120 to 0.170 mg/L;
- Nitrate – median increases from 3.17 to 32.90 mg/L;
- Phosphorus Total – median increases from 0.050 to 0.106 mg/L; and,
- Sulphate – median increases from 54 to 107 mg/L.

The Upper-Tayside Drain is on the eastern edge of the proposed landfill expansion. It has a catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17, 2020. Based on the mean concentrations, SWLTD1, mean concentrations for 2020-2021 of Cl, Fe, Na, NH3 -N, NO3-N and TP were noticeably greater but statistically not different than those of SWFD3 for all samples from 2019 through 2021. Other variables were similar or lower than SWFD3 concentrations

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1. Introduction

1.1. Background

CanDetec Inc. (CanDetec) was contracted by GFL Environmental Inc. (GFL) initially in 2018 to assist with the surface water monitoring program for the existing landfill operation and to develop a monitoring program for characterizing existing surface water aquatic quality and quantity based on data from 2019 and 2020 for the future expansion of the Eastern Ontario Waste Handling Facility (EOWHF). The existing conditions including all information to the end of 2020 was addressed in the CanDetec (2022) report titled "*GFL Eastern Ontario Waste Handling Facility Expansion - Surface Water Existing Conditions Report"*. This report updates existing surface water conditions based on work undertaken throughout 2021 and builds on the **primary existing conditions report**[1] (CanDetec, 2022). The EOWHF existing site and the proposed expansion site did not change significantly in 2021 with respect to surface water. As a result, background and supporting information relevant to the EOWHF and the proposed expansion site are only summarized here.

The existing EOWHF which includes the landfill site, is located within the Township of North Stormont, approximately 5 km north-northwest of the village of Moose Creek, Ontario, and 5 km east of the village of Casselman, Ontario. It lies within the Moose Creek and Fraser Drain watersheds as shown in Figure 1. The landfill occupies approximately 112 hectares (ha) of the entire 189 ha licenced property (HDR, 2018).

The proposed 240 ha landfill "expansion site" is immediately to the east of the existing landfill and is bounded by Concession Road 7 to the north, Highway 138 to the east, Laflèche Road to the south, and the Fraser Drain to the west. An Environmental Assessment (EA) study is being completed in support of the proposed landfill expansion. Establishing the existing surface water quality conditions at the site is required as part of the EA study in order to investigate the potential impacts of the development on the affected surface drainage systems.

Based upon the historical and forecasted filling rate at the existing landfill, GFL estimates that the landfill will reach its approved capacity by late 2025. The purpose of the EA is to provide additional landfill disposal capacity once the existing approved capacity is reached.

The proposed undertaking will occur on land currently owned by GFL to the east of the EOWHF. The lands to the east of the existing EOWHF being considered for future development include the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10.

[1] *The "primary existing conditions report" completed by CanDetec (2022) is referenced throughout this report and forms an integral background for this update. It is hereafter referred to by this name and with this reference.*

In summary, water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow information for the water courses. A dedicated baseline condition assessment commenced in May 2019.[2] The initial review of the data assembled prior to May 23, 2019 demonstrated that:

- Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near the EOWHF;
- Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any sampling overlap for stations in Fraser Drain and Moose Creek affected by periodic treated effluent discharge events; and,
- Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018.

Since May 23, 2019, in part in response to the need for baseline condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters, water quality and quantity monitoring in the receiving waters was enhanced. This enhanced monitoring has continued through to December, 2021.

The purpose of this report is therefore to characterize existing conditions of the surface waters with respect to quality and quantity in the vicinity of the existing landfill and the expansion site from the onset of monitoring through to the end of December 2021. Existing conditions for all watercourses upstream of the effluent discharge location to Fraser Drain will be considered as existing background conditions including Moose Creek (upstream of the confluence with Fraser Drain), Fraser Drain upstream of the effluent discharge location including other drains and tributaries as well as the Upper-Tayside drain. Due to the change in sampling regime that occurred with the dedicated baseline condition monitoring on May 23, 2019 (quarterly monitoring versus monthly or more frequent monitoring after May 23, 2019) the two periods are treated discreetly as statistical water quality differences may be the result of increased sampling frequency that better represents a broader range of hydrologic regimes rather than a true change in water quality.

The Fraser Drain downstream of the effluent discharge location, and Moose Creek below the confluence with Fraser Drain; however, will be considered in three periods to assess trends or changes as a result of the effluent discharge. These periods are pre-discharge (1996 to 2007) early discharge without an emphasis on treated effluent effects monitoring (2007 to May 8, 2019)

[2] *The baseline condition assessment monitoring that commenced on May 23, 2019, is described in detail in Section 3 of the primary existing conditions report (CanDetec 2022).*

and current discharge with an emphasis on treated effluent effects monitoring since May 23, 2019 to December 2021. This update enhances the most recent dataset through the addition of the 2021 data; but, water quality and quantity will nevertheless be evaluated over the full term for completeness.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in impacts on water quality in these water courses and an altered hydrology which have significantly affected existing conditions *vis a vis* natural or historic conditions. Data remain unavailable to address historic conditions (e.g., pre-deforestation and agricultural drainage) in this report.

1.2. Objective of this Report

The objective of this report is to update the primary existing conditions report (CanDetec 2022) through incorporating surface water quality and quantity data for 2021to summarize all available baseline water quality and quantity data to support the EA for the expansion of the EOWHF to the "expansion site". This report considers the historical data available for the study area that dates back to 1996 up to the end of December 2021. This review evaluates site hydrology based on existing data, derives water quality summaries and evaluates water quality trends and, wherever possible, assesses the cause of the noted water quality trends. The water quality and quantity monitoring stations referred to in this report are shown in Figure 2.

1.3. Study Area Delineation

The study area considered in this update, including the existing landfill and the expansion project site, is fully described in Section 1.2 of the primary existing conditions report (CanDetec 2022) and is illustrated in Figure 1.

Ownership and land use at the existing site and the expansion site have remained the same in 2021 but are reiterated here. The majority of the EOWHF site is zoned Waste Disposal, supporting the operation of the landfill. The existing adjacent lands are predominantly agricultural. The land is primarily flat with a system of surface and sub-surface agricultural drains surrounding the existing EOWHF site. The setting within the Moose Creek and Fraser Drain watersheds is shown in Figure 1.

Land uses adjacent to the existing landfill site and the expansion site boundaries are as follows:

- To the North: the land is owned by others and currently used for agricultural purposes (cash crops); beyond that is Highway 417;
- Expansion Site to the East of Existing Site: the land is owned by GFL and is currently leased and used as a sod farm with both surface and subsurface drains;

- To the South of the Existing Site: the land is owned by GFL and is currently leased and used for peat extraction as well as containing a naturally forested area;
- To the South of the expansion site: the land is owned by GFL and is currently leased and used as a sod farm with both surface and subsurface drains: and
- To the West of the Existing Site: the land is owned by others and currently used for peat extraction and primarily for agricultural purposes (cash crops) extending to Moose Creek.

The study areas identified for the EA, which will also be the basis for this study, included the existing EOWHF site encompassing an area of 189 ha plus the 240 ha expansion site as well as potentially affected and contributing surface water areas.

1.4. Leachate Treatment Facility

The Leachate Treatment Facility (LTF) for the current operation is located at the northwest end of the site and has been operational since 2007. The LTF was reviewed in the preceding report (CanDetec, 2022) as it discharges into the Fraser Drain 60 m upstream of the water quality station SW2 and ultimately to Moose Creek upstream of the water quality and the primary water quantity station SW1 (see Figure 2). With respect to certain key water quality variables that are present in the leachate and not mitigated in the LTF, there is a marked signature from the effluent in the receiving waters. As the landfill for the expansion site will utilize this LTF, potentially pending further upgrades, it is necessary to review the conditions in the stream reaches downstream of the LTF discharge, to understand existing conditions as affected by the treated effluent discharge in the affected portions of Fraser Drain and Moose Creek.

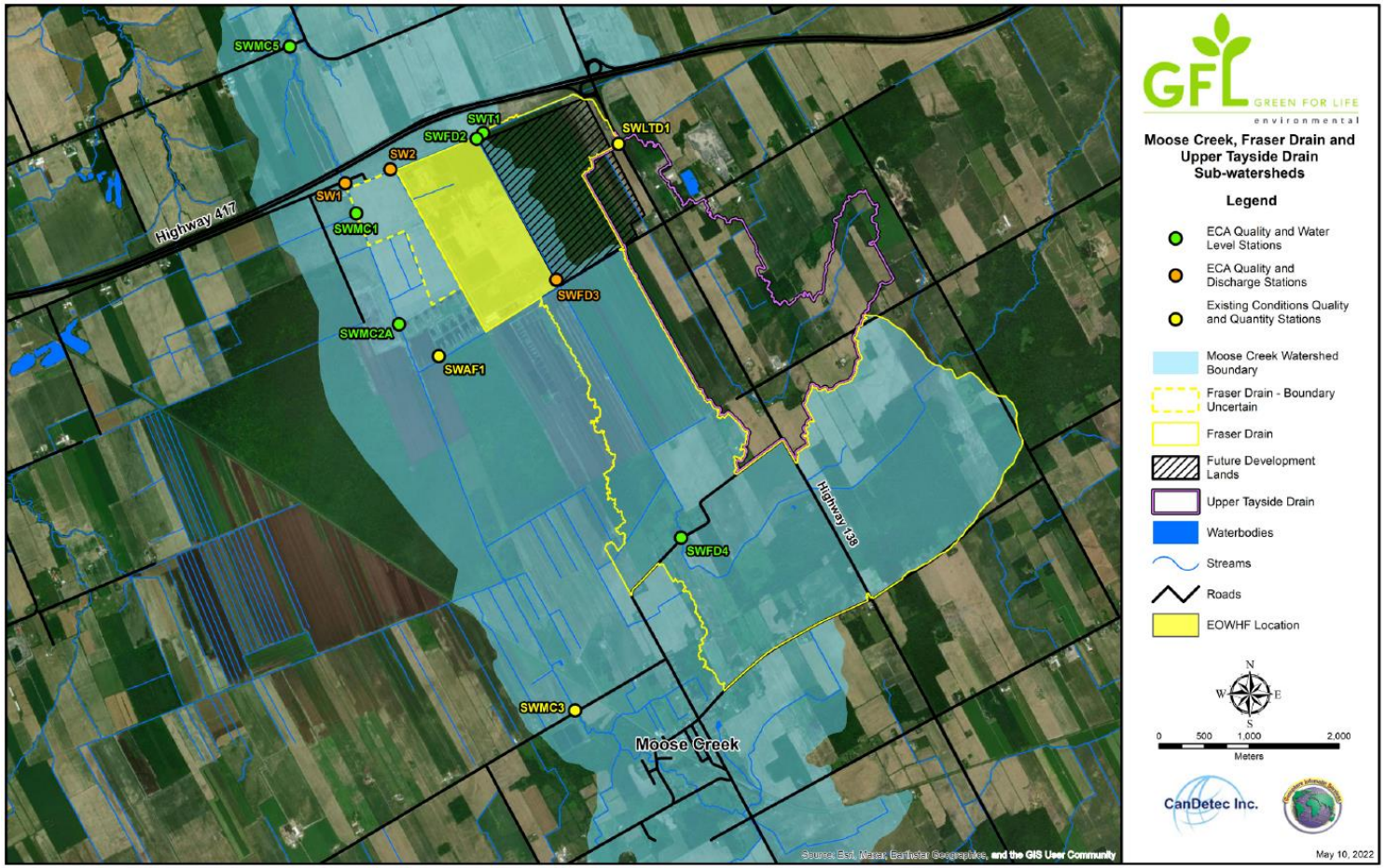
The existing LTF is operated under the Industrial Sewage Works Environmental Compliance Approval (ECA No. 2592-B83KSN, dated March 27, 2019). It has a rated capacity of 833 m3/day and is approved to discharge up to 200,000 m3 of treated effluent per year. Prior to May 2019, treated effluent was discharged from the Effluent Holding Ponds (EHPs) to the Fraser Drain by batch discharge and a common pump rate of 50 L/sec over a pump time of approximately 30 hours providing a total discharge volume of the order of 5,000 to 6,000 m3 per batch. Batch discharges occurred approximately every other week. Since May 2019, effluent has been discharged on a batch basis but at variable discharge rates depending on the rate prescribed by MECP and the discharge in the receiving waters at SW1 such that a minimum ratio of 5:1 receiving water flow to effluent discharge was maintained during the low flow period from May 15 to October 31. No discharge was permitted if Moose Creek flows averaged less than 60 L/sec over a 12-hour period during this period and the maximum effluent discharge rate could not exceed 50 L/sec (MECP Memo, March 27, 2020).

1.5. Stormwater Management

The approved stormwater management (SWM) facilities are not being altered as part of the proposed change in the volume of treated leachate discharge and as a result, stormwater was not considered directly as part of the primary existing conditions report (CanDetec, 2022) and is not incorporated in this update as recently, including 2021, stormwater from the EOWHF has not been discharged to the receiving water of Fraser Drain. As a result, there is not a direct effect of the stormwater on the quality or quantity of the receiving waters. However, the elimination of this volume of water from baseflow impacts on the hydrology of Fraser Drain which in turn can have an effect on water quality.

Figure 1 Watershed Map - Moose Creek, Fraser Drain and Upper Tayside Drain Watersheds, Existing Landfill and Proposed Expansion Lands

Figure 2 Water Quality and Quantity Monitoring Stations within the Moose Creek, Fraser Drain and Upper Tayside Drain Watersheds in the Vicinity of the EOWHF



2. Leachate Management and Treatment

2.1. Introduction

Treated effluent leachate only affects a small part of the receiving surface water system but it can have a dominant effect and must be reviewed to provide an understanding of the existing conditions for the sampling locations affected by the effluent (Stations SW1, SW2 and SWMC5). The leachate and management system and monitoring requirements were reviewed in the primary existing conditions report (CanDetec 2022) report (CanDetec, 2022). As the operation of the LTF did not change in 2021, it will not be reviewed here except with respect to the effluent quality, rates of discharge and volumes of discharge and toxicity of the effluent during 2021.

2.2. Effluent Limits

The approved effluent quality limits for the LTF are provided in Table 1 and remained unchanged for 2021. Under the ECA, the owner shall collect samples from the EHP to be discharged and analyse for the parameters outlined in Condition 6 (1) of the ECA (Table 1) prior to any direct effluent discharge from any EHP to Fraser Drain. If any of the parameters listed under Condition 6 (1) fail to comply with its respective effluent limit, further treatment and testing will be provided to the contents of the EHP prior to discharge.

Table 1 Effluent Limits for Discharge from Effluent Holding Ponds (ECA No. 2592-B83KSN, dated March 27, 2019)

Effluent Parameter	Concentration Limit
5 day Carbonaceous-biological Oxygen Demand (CBOD5) (mg/L)	10.0
Total Suspended Solids (TSS) (mg/L)	10.0
Total Phosphorus (TP) (mg/L)	0.3
Total Ammonia Nitrogen (TAN) (mg/L)	1.0
Dissolved Oxygen (DO) (mg/L)	≥ 4.0
Iron (Fe) (mg/L)	1.0
Copper (Cu) (mg/L)	0.2
Zinc (Zn) (mg/L)	0.2
Phenols (mg/L)	0.005
pH	≥ 6.0 to ≤ 8.5

2.3. Leachate Generation

For comparison purposes, the average total leachate treatment discharges from the existing landfill for each year from 2013 through 2021 are presented in Table 2 and range from 74,779 m^3 to 193,138 m^3 for 2015 and 2018, respectively, reflecting a gradual increase in leachate volume as the current landfill progresses. Although discharge during any one year is largely dependent on precipitation volume, the decrease in total discharge volume in 2019 is a result of the moratorium imposed by MECP on effluent discharge from June 27 to October 31, 2019, as discussed in Section 2.1 of the primary existing conditions report (CanDetec 2022). As a result, some treated effluent was stored in 2019 and discharged in 2020.

Table 2 Estimated Historical Treated Leachate Discharge from Annual Reports (2013 – 2021)

Year	Total Estimated Discharge Volume (m^3/year)	Average Daily Treatment Rate (365 days) (m^3/day)
2013	83,313	228
2014	92,218	253
2015	74,779	205
2016*	132,282	361
2017	165,518	454
2018	193,138	529
2019	149,075	408
2020*	166,380	455
2021	158,436	434

*Calculated for 366 days

2.4. Leachate Quality

Leachate quality for key water quality variables is summarized in Table 3 since 2016 when the LTF was upgraded. Treated effluent quality details are contained in annual reports and the 2021 data are provided in Appendix A. In general, quality of the effluent has improved (concentrations declined) over the course of the six years of operation for boron (B), chloride (Cl), total suspended solids (TSS), sulphate (SO_4) and iron (Fe) with essentially no real change for copper (Cu), sodium (Na), total phosphorus (TP), zinc (Zn), ammonia (NH_3-N), nitrate (NO_3-N), 5 day carbonaceous-biological oxygen demand ($CBOD_5$), phenols, dissolved oxygen (DO) and pH. None of these key water quality variables show a consistent increase over time in the effluent. There were no exceedances of the ECA Effluent Limits in 2021.

Table 3 Summary Water Quality Data for Treated Effluent (2016 – 2021)

Water Quality Variable	Effluent Limit as per ECA	PWQO or CCME/BCMOE Guideline##	2021: Mean ± Standard Deviation (n = 18) [max]	2020: Mean ± Standard Deviation (n = 17) [max]	2019: Mean ± Standard Deviation (n = 30) [max]	2018: Mean ± Standard Deviation (n=33) [max]	2017: Mean ± Standard Deviation (n=23) [max]	2016: Mean ± Standard Deviation (n=29) [max]
Boron (mg/L)		1.200	3.939 ± 0.510 [4.80]	3.839 ± 0.778 [6.15]	4.755 ± 0.986 [6.410]	6.044 ± 0.510 [7.06]	5.998 ± 1.014 [7.300]	8.235 ± 0.825 [9.40]
Chloride		120	601 ± 69 [697]	583 ± 133 [906]	767 ± 143 [931]	797 ± 135 [1000]	589 ± 134 [713]	860 ± 289 [1119]
Copper (mg/L)	0.2	<0.002	0.002 ± 0.001 [0.005]	0.003 ± 0.002 [0.007]	0.004 ± 0.006 [0.036]	0.006 ± 0.003 [0.013]	0.010 ± 0.004 [0.018]	<0.01 ± N/A
Iron (mg/L)	1.0	0.30	0.061 ± 0.024 [0.109]	0.066 ± 0.025 [0.127]	0.128 ± 0.006 [0.195]	0.105 ± 0.044 [0.19]	0.057 ± 0.031 [0.120]	<0.3 ± N/A
Sodium (mg/L)		180	678 ± 72 [818]	614 ± 131 [888]	808 ± 157 [973]	870 ± 92 [1014]	816 ± 90 [994]	1214 ± 154 [1479]
NH_3 -N(mg/L)	1.0		0.256 ± 0.109 [0.660]	0.221 ± 0.077 [0.460]	0.215 ± 0.136 [0.690]	0.328 ± 0.141 [0.780]	0.281 ± 0.387 [1.680]	0.635 ± 0.625 [2.53]
NO_3-N (mg/L)		3.0	261 ± 35 [316]	251 ± 74 [413]	316 ± 62 [378]	234 ± 54 [332]	193 ± 43 [260]	362 ± 49 [394]
CBOD5 (mg/L)	10		<DL	3.0 ± NA [1 > DL]	<DL	<3 ± (N/A)	2.20 ± 1.17 [4.00]	2.10 ± 0.83 [4]
TSS* (mg/L)	10		4.6 ± 1.71 [8]	3.6 ± 0.62 [5]	5.0 ± 3.6 [17]	6.6 ± 2.1 [10]	7.7 ± 5.0 [24]	6.9 ± 4.5 [17]
TP (mg/L)	0.3	0.03	0.110 ± 0.640 [0.270]	0.074 ± 0.019 [0.100]	0.15 ± 0.165 [0.310]	0.108 ± 0.022 [0.17]	0.108 ± 0.030 [0.190]	0.158 ± 0.075 [0.37]
SO_4		429	232 ± 43 [316]	236 ± 44 [319]	323 ± 171 [263]	712 ± 221 [1010]	558 ± 195 [936]	499 ± 169 [761]
Zinc (mg/L)	0.2	0.03	0.065 ± 0.012 [0.086]	0.057 ± 0.020 [0.093]	0.089 ± 0.0004 [0.110]	0.100 ± 0.015 [0.124]	0.056 ± 0.019 [0.093]	0.133 ± 0.047 [0.200]
Phenols# (mg/L)	0.005	0.001	0.005 ± 0.001 [0.006]	0.004 ± NA [1 sample >DL]	0.002 ± 0.018 [0.109]	0.014 ± 0.007 [0.026]	0.003 ± 0.001 [0.005]	0.002 ± 0.0015 [0.007]
DO (mg/L)**	≥ 4	4	11.7 ± 2.4 [8.89]	12.4 ± 1.5 [10.4]	11.7 ± 2.5 [7.93]	11.4 ± 1.7 [8.14]	10.8 ± 2.6 [6.2]	10.5 ± 1.9 [7.16]
pH Range (pH units)	6.0 – 8.5		7.67 ± 0.39 [7.06]	7.8 ± 0.41 [8.41]	7.9 ± 0.40 [8.42]	7.8 ± 0.3 [8.4]	7.9 ± 0.2 [8.3]	7.9 ± 0.4 [8.8]

*TSS = Total Dissolved Solids, ** DO = field dissolved oxygen, [minimum] #Phenols at <0.002 mg/L taken as 0.002 mg/L ##PWQO = Provincial Water Quality Objective, CCME = Canadian Council of Ministers of Environment, BCMOE = British Columbia Ministry of Environment

2.5. Potential Toxicity of Treated Effluent to Aquatic Life of Receiving Waters

2.5.1. Un-ionized Ammonia in Treated Effluent

Un-ionized ammonia in the treated effluent can be acutely toxic to aquatic organisms if the concentration in the receiving waters is in excess of 0.02 mg/L (MOEE, 1994a). Calculated un-ionized ammonia data from detailed chemical analysis for the treated effluent prior to discharge to the Fraser Drain, and downstream and upstream of the effluent discharge location (SW2 and SWFD3 respectively) are available in the annual reports for 2016 through 2021 (Tetra Tech, 2017, 2018, 2019, 2020 and 2021). These include calculated un-ionized ammonia concentrations except when field data or NH_3-N data were not available. These data, for all discharge events and for receiving water samples both upstream and downstream of the discharge location, are summarized in Table 4.

The treated effluent exceeded the Provincial Water Quality Objective (PWQO) (MOEE, 1999) for un-ionized ammonia whenever it was measured between 2016 and 2018. By 2019, un-ionized ammonia in the treated effluent exceeded the PWQO on only 6 occasions during the summer and no exceedances occurred in 2020 and 2021. Two exceedances of the PWQO occurred at SW2 downstream of the discharge location in 2019 and a single exceedance occurred in 2020. There were no exceedances at SW2 in 2021. From time to time, existing condition concentrations of un-ionized ammonia in the Fraser Drain may exceed the PWQO although this is un-related to the effluent discharge from the EOWHF. Further upstream at SWFD3, un-ionized ammonia did not exceed the PWQO between 2016 and 2021 indicating that existing conditions upstream of the direct influence of the EOWHF on Fraser Drain consistently meet the PWQO for un-ionized ammonia except occasionally at SWFD2.

Table 4 Comparison of Un-ionized Ammonia Concentrations in Effluent, Downstream of Discharge at SW2 and Upstream at SWFD3

(Note: red numbers indicate concentrations exceed the PWQO; some receiving water sampling dates do not coincide with effluent quality sampling dates; this table has been updated for both 2019 and 2020 as well as for 2021)

Date	Concentration of Effluent (mg/L)	Concentration at SW2 – downstream (mg/L)	Concentration at SWFD3 – upstream (mg/L)	Date	Concentration of Effluent (mg/L)	Concentration at SW2 – downstream (mg/L)	Concentration at SWFD3 – upstream (mg/L)
2016-07-11	0.0478	0.0232	0.0154	**2020-01-10**	0.0018	0.0204	0.0004
2016-10-27*	0.0515	NA	NA	**2020-01-22**	0.0013	NA	NA
2017-06-22*	0.0352	NA	NA	**2020-02-04**	0.0009	NA	NA
2017-08-03*	0.0352	NA	NA	**2020-02-14**	0.0004	0.0005	0.0002
2017-09-14*	0.0251	NA	NA	**2020-03-03**	0.0067	NA	NA
2018-06-28&29	0.0301	NA	NA	**2020-03-17**	0.0111	0.0119	0.0010
2018-07-10	0.0583	0.0553	0.0052	**2020-03-27**	0.0026	NA	NA
2018-07-26&27	0.0251	NA	NA	**2020-04-07**	0.0047	0.0015	0.0013
2018-08-09*	0.0290	NA	NA	**2020-04-20**	0.0035	NA	NA
2018-08-15&16	0.0242	0.0333	0.0015	**2020-05-03**	0.0023	NA	NA
2018-08-27&28	0.0253	NA	NA	**2020-05-08**	0.0034	0.0037	0.0034
2018-09-12&13	0.0271	NA	NA	**2020-05-14**	0.0130	0.0005	NA
2019-01-19	0.0021	NA	NA	**2020-07-30**	0.0034	0.0023	0.0140
2019-02-21	0.0010	NA	NA	**2020-08-04**	0.0130	0.0458	0.0178
2019-03-11	NA	0.0102	0.0132	**2020-08-26**	0.0130	0.0034	NA
2019-03-15	0.0014	NA	NA	**2020-10-13**	0.0021	0.0182	NA
2019-03-21	0.0014	NA	NA	**2020-11-03**	0.0049	0.0007	NA
2019-04-19	0.0022	NA	NA	**2020-11-12**	0.0021	NA	NA
2019-04-24	0.0061	NA	NA	**2020-11-25**	0.0018	NA	NA
2019-05-6-8	0.0338	0.0015	0.0006	**2020-12-09**	0.0011	0.0001	NA
2019-05-23&24*	0.0212	NA	NA	**2020-12-16**	0.0004	NA	NA
2019-06-06	NA	NA	NA	**2021-01-05**	0.0004	NA	NA

Date	Concentration of Effluent (mg/L)	Concentration at SW2 – downstream (mg/L)	Concentration at SWFD3 – upstream (mg/L)	Date	Concentration of Effluent (mg/L)	Concentration at SW2 – downstream (mg/L)	Concentration at SWFD3 – upstream (mg/L)
2019-06-19	0.0080	NA		**2021-01-14**	0.0004	0.0007	0.0002
2019-06-17&18	0.0349	0.0015	0.0006	**2021-01-27**	0.0007		
2019-08-23	0.0439	0.0184	0.0005	**2021-02-17**	0.0019	0.0007	0.0002
2019-08-27	0.0255	0.0262	0.0075	**2021-02-25**	0.0005	0.0099	0.0010
2019-08-30	0.0320	0.0312	0.0008	**2021-03-16**	0.0008	NA	NA
2019-09-03	0.0301	0.0186	0.0004	**2021-03-30**	0.0016	0.0016	0.0058
2019-09-06	0.0101	0.0142	0.0003	**2021-04-23**	0.0067	0.0004	NA
2019-09-10	0.0090	0.0083	0.0001	**2021-04-28**	0.0162	0.0120	0.0011
2019-10-15	0.0162	0.0120	0.0001	**2021-05-08**	0.0188	NA	NA
2019-10-18	0.0099	0.0016	0.0001	**2021-05-14**	0.0025	0.0016	0.0015
2019-10-22	0.0073	0.0051	0.0001	**2021-06-28**	NA	0.0049	0.0019
2019-10-25	0.0056	0.0054	0.0001	**2021-07-15**	NA	0.0090	NA
2019-10-29	0.0175	0.0013	0.0001	**2021-10-05**	NA	0.0075	NA
2019-10-31	0.0209	0.0030	0.0003	**2021-10-27**	0.0078	0.0018	0.0005
2019-11-06	0.0046	NA	NA	**2021-11-04**	0.0031	0.0002	0.0001
2019-11-14	0.0020	NA	NA	**2021-11-23**	0.0031	NA	NA
2019-11-22	0.0004	NA	NA	**2021-11-24**	0.0054	NA	NA
2019-12-05	0.0041	NA	NA	**2021-12-03**	0.0019	NA	NA
2019-12-06	NA	0.0020	0.0003	**2021-12-13**	0.0015	NA	NA
2019-12-11	0.0019	NA	NA	**2021-12-23**	0.0012	0.0003	NA
2019-12-20	0.0015	NA	NA				

* These sample dates, as far as can be determined, did not coincide with receiver sampling as related un-ionized ammonia concentrations in Fraser Drain are not reported (NA = not available).

The effluent discharge limit is based on total ammonia at 1 mg/L rather than un-ionized ammonia. The effluent consistently met the effluent limit for total ammonia in 2018, 2019, 2020 and again in 2021. However, total ammonia in the receiving water at SW2 exceeded 1 mg/L on Feb. 14, 2020, March 17, 2020, Feb. 25, 2021 and March 30, 2021. Upstream at SWFD2, total ammonia greater than 1 mg/L only occurred on March 30, 2021. Further upstream at SWFD3, total ammonia concentrations were always an order of magnitude or more below the concentrations in the effluent or at SW2 indicating that existing conditions with respect to ammonia in the Fraser Drain upstream of the effluent discharge are generally low and well below the effluent concentration guideline.

3. Surface Water and Receiver Monitoring Background

3.1. Introduction

Section 3 of the report introduces the quality and quantity monitoring program for the study area. Although this is detailed in the primary existing conditions report (CanDetec 2022) it is summarized here. In addition to summarizing the monitoring stations and naming development for the monitoring stations, background information is updated with respect to Quality Assurance and Quality Control (QA/QC) for the recent water quality monitoring. Acute and chronic toxicity testing requirements for the effluent and the receiving waters are also covered.

3.2. Effluent and Surface Water Receiver Monitoring

3.2.1. Receiver Monitoring Prior to May 2019

Samples were collected from the designated sampling locations (Figure 2) and at the frequency and sample type specified and analysed for the parameters listed in Table 2. Historically, amended ECA No. 2592-B83KSN, dated March 27, 2019, set surface water receiver monitoring requirements for Stations SW2 (downstream of discharge) and SWFD3 (upstream of discharge). Sampling was required during every fourth discharge event based on periodic discharges when the effluent ponds were full and met discharge requirements. The consolidated ECA no. A420018 (Condition 54.0), Schedule "C" also required water quality samples to be collected during the prescribed periods of the year (spring, summer, fall and winter) at Stations SW1, SW2, SWFD3 and SWFD4. Noteworthy is the fact that these samples, historically, were not required to be collected at times of effluent discharge and as a result, represent seasonal existing conditions in the watercourses.

3.2.2. Sampling Station Naming Development

This monitoring program was modified in 2019 as outlined in the primary existing conditions report (CanDetec 2022) and summarized here. This realignment resulted in the discontinuation and addition of monitoring stations and necessitated a re-identification of the monitoring stations to avoid duplication and confusion. The surface water receiver monitoring station nomenclature effective as of May 2019 incorporates FD for Fraser Drain, MC for Moose Creek, AF for Albert-Fahey Award Drain and LT for Upper-Tayside Drain. Un-named drains are simply noted as Drains (D). The exception for this naming procedure were stations SW1 and SW2 which have not been re-named for continuity. The historic sampling location name and the corresponding new station names are provided in Table 5. This comparison is provided so that historic data references, which may include the pre-2019 identification can be linked to the current station abbreviated name. In 2021, MECP required the addition of an additional downstream station on Moose Creek referred to here and in Figure 2 as SWMC5.

Table 5 Surface Water Receiver Monitoring Station Naming Nomenclature for Pre- and Post-May 2019

Pre-May 2019 Site Name	2019 / 2021 Site Name	Site Description
SW1	SW1	Moose Creek, downstream of bridge at Road 7 (note that the water quantity station is upstream of the bridge)
SW2	SW2	Fraser Drain, approximately 20 m east (downstream) of twin culverts and 60 m downstream of effluent discharge location
SW3	SWFD3	Fraser Drain approximately 20 m north (downstream) of Laflèche Road
SW4	SWFD4	Fraser Drain downstream of Norman Drive
SW2-3A	SWFD2	Fraser Drain upstream of 90º bend at north east corner of landfill at Road 7 and downstream of field drain from the east
SWT1	SWT1	Roadside ditch on south side of Road 7 entering Fraser Drain at northeast corner of landfill (requested by MECP)
NA*	SWMC1	Moose Creek approximately 60 m upstream of confluence of Fraser Drain
NA	SWMC2A	Moose Creek approximately 560 m downstream of confluence of Albert-Fahey Drain and Moose Creek and approximately 4700 m downstream of SWMC3
NA	SWMC3	Moose Creek at No. 8 Road, downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1
NA	SWMC5	Moose Creek at No. 3 Road, approximately 1.6 km downstream of SW1
NA	SWLTD1	Upper-Tayside Drain at Highway 138 (only since 2020-03-17)
NA	SWAF1	Albert – Fahey Award Drain approximately 200 m upstream of confluence with Moose Creek

*NA = not applicable

3.2.3. Effluent and Receiver Monitoring Since May 2019

As of May 2019, GFL proposed enhanced water quality and quantity sampling as a result of recommendations made in the first version of the Surface Water Impact Assessment Report (CanDetec, 2019). Other direction was received in correspondence from the MECP which limited discharge during the dry season (May 15 to October 31) annually and further prescribed conditions limiting effluent discharges during this period. These limitations are discussed fully in section 3.1.3 of the primary existing conditions report (CanDetec 2022). Accordingly, the sampling program for 2019, 2020 and 2021, was expanded in consultation to comply with the requirements of the MECP directions. The monitoring requirements for the revised sampling regime are summarized in Table 6. Water quality, quantity and field measurement events for 2019, 2020 and 2021 are listed in Appendix B.

Table 6 Surface Water Receiver Monitoring Requirements

Locations	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD1, SWT1, SWMC1, SWMC2A, SWMC5 SWAF1, SWLTD1
Frequency	Monthly for general water chemistry, metals and phenols coinciding with the sampling of treated leachate from the Effluent Holding Ponds and quarterly for organics
Sample Type	Grab
Parameters	General (monthly): Alkalinity, CBOD5, Calcium, Chemical Oxygen Demand (COD), Chloride, Conductivity, Dissolved Organic Carbon (DOC), Dissolved Oxygen (DO), Magnesium, Nitrate Nitrogen, Nitrite Nitrogen, Potassium, pH, Sodium, Sulphate, Temperature, Total Ammonia Nitrogen, Total Dissolved Solids, Total Kjeldahl Nitrogen, Total Phosphorus, Dissolved Phosphorus (lab filtered), Total Suspended Solids
	Metals (monthly): Aluminum (filtered in field), Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Selenium, Silver, Zinc
	Organics (monthly): Phenols Organics (quarterly): Benzene, 1,4-Dichlorobenzene, Dichloromethane, Toluene, Vinyl Chloride
Field Parameters (all samples)	Dissolved Oxygen (DO), pH, Temperature, Specific Conductance (Note: calibration required to be demonstrated)

The field measurements, temperature, pH and dissolved oxygen at the receiver sites were determined in the field at the time of sampling of Total Ammonia Nitrogen (TAN). The concentration of un-ionized ammonia was to be calculated using the TAN concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized) (MOEE, 1994a). Specific conductance was also measured in the field.

The 2019 through 2021, sampling was conducted for water quality including field measurements for the dates and stations identified in Appendix B[3]. Samples were collected by staff of SLR Consulting (Canada) Ltd. (SLR) and/or staff of GFL. Also shown in Appendix B are the dates and stations where water quantity measurements were taken as well as field duplicate samples for quality control assessments. These are discussed below. Note that while the monitoring program required sampling at the sites identified, flow measurements and quality sampling was not always possible due to dry or stagnant conditions at a specific location.

[3] *This tabulated information has been moved from Table 7 of the original existing conditions report to Appendix B of this supplement due to its length.*

3.3. Field Procedures and Quality Assurance/Quality Control (QA/QC)

3.3.1. Field Procedures – Water Quality

Field procedures for water quality sampling did not change in 2021 and reference is made to the primary existing conditions report (CanDetec 2022) for details.

3.3.2. Field Procedures – Water Quantity

Field procedures for water quantity did not change in 2021 from those reported in the primary existing conditions report (CanDetec 2022). However, as the addition of 2021 stream flow data and the development of historic streamflow data for Moose Creek at SW1 is an addition to this report, field methods for water quantity measurements are summarized.

Streamflow measurements by SLR Consulting were made using standard velocity-area methods using a Hach Flo-Mate (FH-950) MF Pro and wading rod. The wetted width of the stream was measured, and the length was divided into an even number of intervals. Depth (metres) and velocity (metres/second) were recorded at each interval beginning at the left bank and moving towards the right bank. For the purposes of this investigation, "left bank" was the bank situated on the left while facing upstream. Any important information that may have impacted velocity outcome (obstructions, boulders, shallow water, etc.) was also recorded. Measurements were not attempted under no flow or stagnant water conditions.

A Solinst™ water level logger was installed in a well fixed to the bridge across Moose Creek at SW1 in May 2020. This logger recorded water levels every 15 minutes and transmitted levels to a custom-built on-line interface that plotted "continuous" flows and calculated 12-hour average flows. This information was accessible on-line and based on the 12-hour average flow, the decision to discharge treated effluent and the rate of discharge between 10 and 50 L/sec was determined. A Solinst barologger for atmospheric pressure compensation was also installed at SW1. A rating curve was developed, as discussed further below, for estimating flow from stream water level in the monitoring well.

3.3.3. Field Procedures – Quality Assurance/Quality Control (QA/QC)

Two QA/QC procedures were used in 2019 through 2021 for samples collected by SLR. The first was to collect a duplicate for each sample event. The second quality control procedure was the use of internal sample checks using deuterated surrogates of 1,2-dichloroethane (d4) and toluene (d8) and reporting the recoveries of these standards as a percent of the surrogate mass. A third, non-deuterated surrogate of 4-bromofluorobenzene was also reported as a percent recovery of the internal surrogate. The sample surrogates were introduced to the samples at the laboratory. The duplicates were only collected as part of the sampling undertaken by SLR and the internal surrogates were only used by Eurofins. Samples submitted to Caducean Environmental Laboratories did not include internal standards for the analysis or a field duplicate sample. Additional information on QA/QC procedures is provided in the primary existing conditions report (CanDetec 2022).

Field procedures were implemented to minimize the potential of cross contamination between sampling locations. Field handling of samples was minimized by transferring samples directly into containers,

when possible. Where handling was required, disposable nitrile gloves were used at all times and changed between samples.

3.3.4. Quality Assurance/Quality Control Results

The recovery of internal surrogates is summarized in Table 7 for samples in 2019, 2020 and 2021. The surrogate recoveries illustrate generally high analytical quality with mean values calculated close to 100% with very low standard deviations usually of the order of 10%. The surrogate recoveries demonstrate that analytical procedures produce results that are uniform and reproducible.

Table 7 Surrogate Recoveries as a Percent of the Spiked Surrogate in Surface Water Samples

*(Number of Samples {n}, mean and 1 standard deviation) by Sampling Station (2019 to 2021)**

Station	1,2-dichloroethane-d4	4-bromofluorobenzene	Toluene-d8
SW1	n = 10, 111 ± 15	n = 10, 97 ± 14	n = 10, 103 ± 7
SW2	n = 10, 105 ± 13	n = 10, 96 ± 13	n = 10, 101 ± 7
SWFD2	n = 7, 105 ± 10	n = 7, 97 ± 14	n = 7, 101 ± 6
SWFD3	n = 10, 102 ± 13	n = 10, 96 ± 11	n = 10, 100 ± 9
SWFD4	n = 10, 103 ± 13	n = 10, 96 ± 10	n = 10, 99 ± 9
SWD2	n = 5, 108 ± 12	n = 5, 95 ± 13	n = 5, 99 ± 8
SWMC1	n = 10, 103 ± 12	n = 10, 97 ± 12	n = 10, 99 ± 8
SWMC2A	n = 9, 104 ± 11	n = 9, 101 ± 17	n = 9, 101 ± 7
SWMC3	n = 10, 103 ± 12	n = 10, 95 ± 13	n = 10, 100 ± 8
SWMC5	n = 5, 110 ± 14	n = 5, 87 ± 11	n = 5, 106 ± 5
SWT1	n = 3, 97 ± 4	n = 3, 104 ± 10	n = 3, 101 ± 6
SWAF1	n = 9, 100 ± 13	n = 9, 98 ± 14	n = 9, 105 ± 11
SWLTD1	n = 6, 109 ± 12	n = 6, 90 ± 13	n = 6, 96 ± 5

*Mean and standard deviation only determined if more than 2 samples

The reproducibility among the potential 39 samples from 2019 through 2021 are presented in Appendix C. The calculated "relative percent difference" (RPD) are presented in the appendix. It is noteworthy that the RPD is a weak statistic for comparing analytical results between a parent and a duplicate sample due to the fact that a small absolute difference of a very low concentration can produce a large RPD (e.g., concentrations of 0.01 versus 0.02 mg/L produces a 50% RPD but reproducibility at low concentrations is inherently more difficult and an absolute difference of 2 may be an unimportant analytical difference). Thus, these values need to be viewed with caution usually comparing individual variables rather than comparing among variables

Most variables had average RPDs less than 20%. The exceptions were:

- CBOD5 (31%, n=25);
- phenols (21%, n=16);
- selenium (31%, n=7);
- soluble P (25%, n=25);
- total suspended solids (24%, n=21); and,
- zinc (28%, n=7).

The number of samples above the detection limit for each variable is also indicated which obviously affects the statistics for selenium and zinc. Several samples had one or more analytes with RPDs greater that 20% but only the sample from SWMC1 on 2020-04-07 had multiple analytes with RPD values >40% (cobalt [Co], chemical oxygen demand [COD], chromium, [Cr], copper [Cu], iron [Fe], manganese [Mn], ammonia [NH_3-N], total phosphorus [TP] and total suspended solids [TSS]). In summary, reproducibility for analytes among the replicate samples is very good with limited exceptions.

3.3.5. Acute and Chronic Toxicity Testing Procedures

Acute toxicity requirements for the effluent prior to discharge are summarized in Table 8. More frequent sampling occurred for 2019 through 2021 for both acute and chronic toxicity. Details on the sampling and testing requirements are provided in the primary existing conditions report (CanDetec 2022). Samples were submitted to Aquatox Testing and Consulting Inc. within the required sample holding time frame for determination of 48-hour test results for determining acute lethality of the effluent for *Daphnia magna* (Environment Canada, 2000a) and for rainbow trout (Environment Canada, 2000b). Tests for chronic toxicity were also completed by Aquatox Testing and Consulting Inc. Seven-day tests were conducted using fathead minnow considering impairment and mortality (Environment Canada, 2012) while ten-day tests using *Ceriodaphnia dubia* considered survival and reproduction (Environment Canada, 2007).

Table 8 Requirements for Toxicity Testing of Effluent[4]

Location	Effluent Holding Pond To Be Discharged
Frequency	Prior to Every Fourth Planned Batch Discharge Event
Sample Type	Composite – three (3) equal volume grab samples collected from the water surface, 1/3 depth, 2/3 depth of the effluent holding pond.
Parameters	Acute Toxicity – Rainbow Trout and *Daphnia magna* Chronic Toxicity – Fathead Minnow and Cladoceran *Ceriodaphnia dubia*

[4] *Note that the toxicity sampling protocols were modified from the ECA as discussed in Section 3.1.3.*

4. Existing Surface Water Conditions Within the Study Area

4.1. Introduction

This section of the report will deal with the primary discussion of the surface water quantity and quality of the study area. The water quantity discussion is extensive here as the measurement of quantity in the surface water was very limited historically (i.e., prior to May 2019). The emphasis here will be on the data that have been assembled since May 2019 especially with respect to the continuous water level measurements at SW1 and the development of the rating curve for estimating flow and the subsequent development of long-term flow estimates and related low flow statistics for Moose Creek at SW1 using a surrogate surface water system.

Surface water quality data will cover the full period of record of available data and will consider all monitored locations including those that represent existing conditions outside of the influence of the EOWHF as well as monitoring locations affected by the landfill. The data are tabulated to represent periods of the full data record that represent times of consistent conditions. This allows the data for these time periods to be pooled, simplifying the analysis and strengthening the statistics that represent a broader range of conditions. Nevertheless, summarizing 25 years of data for some sites to characterize existing conditions requires careful analysis and sometimes lengthy analysis.

4.2. Features of the Study Area that Affect Existing Conditions

The EOWHF and the expansion site (together, the Study Area) are located in a predominantly agricultural area with peat extraction activities to the south and west of the site (HDR 2017). Land uses and the natural environment have not changed significantly during 2021 but the features of the study area are critical to understanding existing conditions and therefore are repeated here. A full discussion of these features and their potential effect on water quality and quantity is provided in the primary existing conditions report (CanDetec 2022) and is not repeated here as conditions have not changed meaningfully.

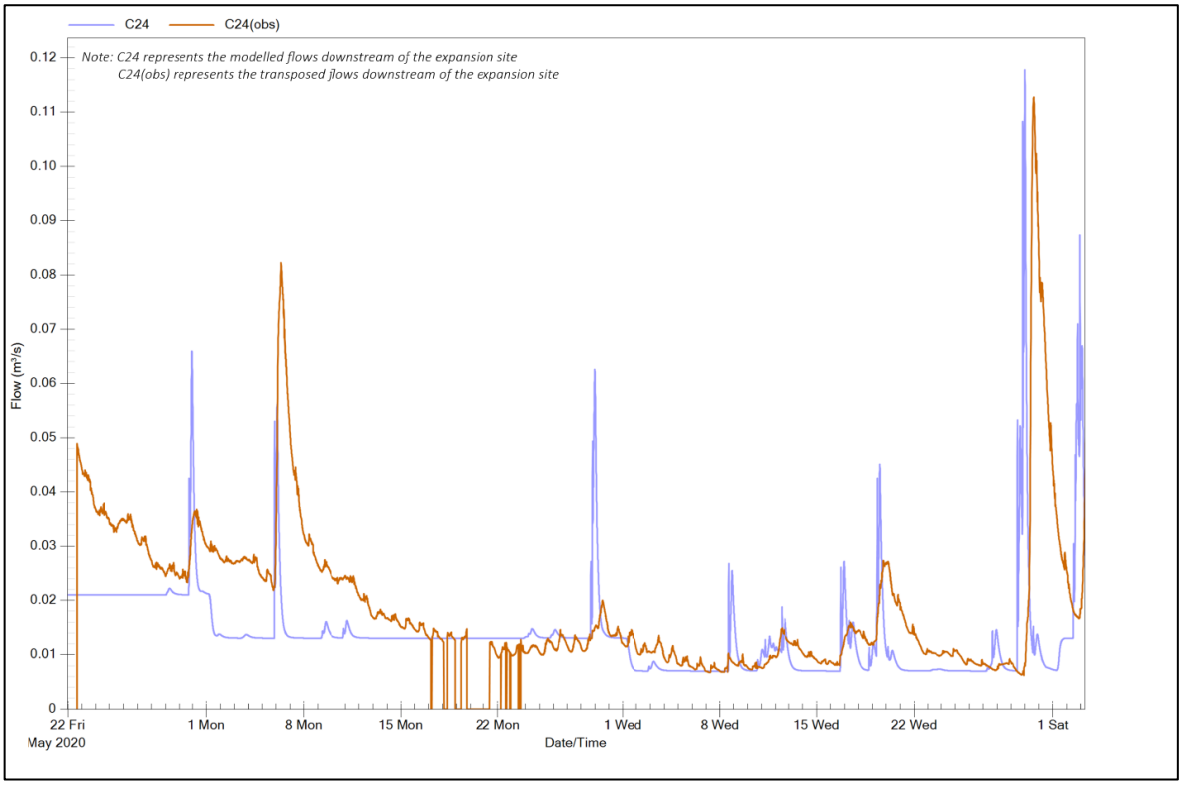
4.3. Water Quantity

4.3.1. Modelled Surface Water Quantity Conditions

Sabourin and Associates (2017a) and HDR (2020) undertook extensive surface water quantity assessments for the EA for the expansion of the existing site and for the expansion site to the east, respectively, including runoff modeling, topographic and LiDAR surveying of stream cross sections and topography, air photos and land cover and soils type data. These reports updated information on the existing drainage and the hydraulic capacities of the site's drainage features. This information was discussed in the primary existing conditions report (CanDetec 2022) and has not been updated in 2021. However, as background to this discussion of hydrology in Fraser Drain, it was considered appropriate to reiterate the comparison by HDR (2020) to continuous flow monitoring data from SW1. The review revealed that the timing of the peak flows generated by the model for Fraser Drain did not correspond to the peak flows of the transposed measured flows as illustrated in Figure 3 (HDR, 2020). Several factors

were identified that help explain the absence of agreement. First, during the "wet" season (e.g., May, June and October) the declining limb of the hydrograph transposed to SW2 from the SW1 continuous flow data has a much longer tail than predicted by the model. This is an artifact of the larger drainage basin area and the presence of the wetlands and naturally wooded areas in the Moose Creek watershed that attenuate the runoff. This lag effect is generally missing in Fraser Drain and the transposed data from SW1 would have to be controlled for this effect.

Figure 3 Comparison of PC-SWMM Modelled Flows and Transposed Flows from Moose Creek at SW1 to the Downstream Location on Fraser Drain (SW2) for the Proposed Landfill Expansion (source: HDR, 2020)



Secondly, Fraser Drain has been documented as an influent stream under low flow conditions particularly in the reach between SWFD3 and SW2. This loss of flow appears to be a result of the shallow groundwater in the peaty soils dropping below the bed of the watercourse during the dry season resulting in stagnant pools and limited to no flow in this area and as far downstream as SW2. Consequently, rainfall events, which according to the model would generate flow within Fraser Drain, fail to do so as they are filling available storage in the surficial soils. Filling the available storage between the groundwater table and the base of the watercourse is gradually overcome in the fall season again as illustrated in Figure 3.

4.3.2. Measured Stream Discharge

Prior to 2019, instream flow measurements were limited to approximately four flow measurements annually (approximately spring, summer, fall and early winter) at SW1, SW2 and SWFD3 (see primary existing conditions report (CanDetec 2022)). Commencing in May 2019, flow measurements were taken simultaneously with water quality sampling events at SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3 and SWMC3 and since March of 2020 at SWLTD1 when sufficient flow was present (Table 9). Exceptions occurred when flow was not evident or stagnant or the stream was frozen or ice or flow conditions made flow measurements unsafe for field staff.

Table 9 Spot Flow Measurement Data for Moose Creek, Fraser Drain and Upper-Tayside Drain from May 2019 to December 2021

Measure-ment Date	Treated Effluent Discharge Rate (L/sec)	SW1 Flow (L/sec)	SWMC3 Flow (L/sec)	SW2 Flow (L/sec)	SWFD3 Flow (L/sec)	SWFD4 Flow (L/sec)	SWAF1 Flow (L/sec)	SWT1 Flow (L/sec)	SWFD2 Flow (L/sec)	SWLTD1 (L/sec)
2019-5-23	50	609	253	153	69	38	71	2.3	NM	NM
2019-6-6	50	304	125	60	33	37	21	2.1	NM	NM
2019-6-10	0	21	NM	NM	NM	NM	NM	NM	NM	NM
2019-6-19	0	NM	141	NM	14	NM	32	NM	NM	NM
2019-7-10	0	21	NM	<1	7.4	NM	3.9	NM	NM	NM
2019-7-12	0	NM	731	86	47	39	4.3	NM	NM	NM
2019-8-8	0	52	10	<1	1.3	4.3	3.7	NM	NM	NM
2019-9-4	20	61	27	3.9	2.5	7.4	14	NM	NM	NM
2019-9-23	0	NM	14	NM	<1	3.9	3.1	NM	NM	NM
2019-10-10	0	29	21	3.0	12	6.7	5.1	Stag-nant	NM	NM
2019-10-18	10	590	184	98	41	31	18	NM	NM	NM
2019-10-25	10	226	NM	15	19	NM	NM	NM	NM	NM
2019-10-31	10	364	NM	77	43	NM	NM	NM	NM	NM
2019-11-6	50	985	513	206	100	54	44	17	NM	NM
2019-12-11	50	339	373	129	64	509	17	4.6	NM	NM
2020-01-10	50	44	104	55	frozen	11	12	frozen	NM	NM
2020-02-14	50	10	NM	1.5	2.4	0.9	NM	NM	NM	NM
2020-03-17	50	NM*	1212	393	246	242	99	190	NM	294
2020-04-07	50	1408	630	287	144	120	63	NM	200	62
2020-05-08	50	263	70	79	16	20	11	NM	28	28
2020-05-14	50	190	49	57	10	13	11	NM	21	6
2020-06-15	0	31	NM	NM	NM	NM	NM	NM	NM	NM

Measure-ment Date	Treated Effluent Discharge Rate (L/sec)	SW1 Flow (L/sec)	SWMC3 Flow (L/sec)	SW2 Flow (L/sec)	SWFD3 Flow (L/sec)	SWFD4 Flow (L/sec)	SWAF1 Flow (L/sec)	SWT1 Flow (L/sec)	SWFD2 Flow (L/sec)	SWLTD1 (L/sec)
2020-07-30	26 – 30**	302	34	158	23	13	2.7#	NM	57	43
2020-08-04	50	513	99	361	92	65	8.3#	NM	110	99
2020-08-26	12	118	10	48	12	8.3	14	NM	34	9
2020-10-13	12	94	46	26	25	51	14	NM	11#	16
2020-11-03	50	317	135	133	52	38	18	NM	40	25
2020-12-09	50	480	185	122	49	30	11	NM	53	32
2021-01-14	50	NM	78	79	31	19	12	NM	0	12
2021-02-05	50	NM	101	56	8	6	NM	NM	NM	4.2
2021-03-30	50	236	909	443	241	133	94	NM	232	129
2021-04-23	50	509	262	73	40	36	30	NM	56	12
2021-05-14	50	296	99	82	24	28	12	NM	28	13.5
2021-06-28	38	195	62	27	8	5	6	NM	7	9.3
2021-07-15	50	827	NM	261	72	19	NM	NM	3.5	52
2021-10-05	50	313	179	101	18	18	NM	NM	1.4	NM
2021-11-04	15	600	278	208	94	43	NM	NM	4.0	11
2021-12-03	50	723	381	204	118	72	NM	NM	4.0	106

NM – not measured
*not safe to measure
#measured over weir
**effluent discharge variable due to changing flow in Moose Creek

Measured flows for the headwater stations (taken as SWFD4, SWFD3, SWLTD1 and SWAF1) are illustrated in Figure 4. There is considerable similarity with respect to the response of these stations to freshet and storm events. The main contributing watercourses to the total discharge at SW1 are illustrated in Figure 5. The large contribution of flows from upstream Moose Creek (SWMC3) is evident for SW1 during the freshet. However, it is evident that flows from Fraser Drain (SW2) seem to play a greater role in contributing discharge to Moose Creek for some part of the summer season and into the fall season whereas Moose Creek flows tend to be dominant the winter and spring.

Figure 4 Comparison of Measured Flows for Headwater Stations SWFD4, SWFD3, SWLTD1 and SWAF1 (May 23, 2019 to December 3, 2021)

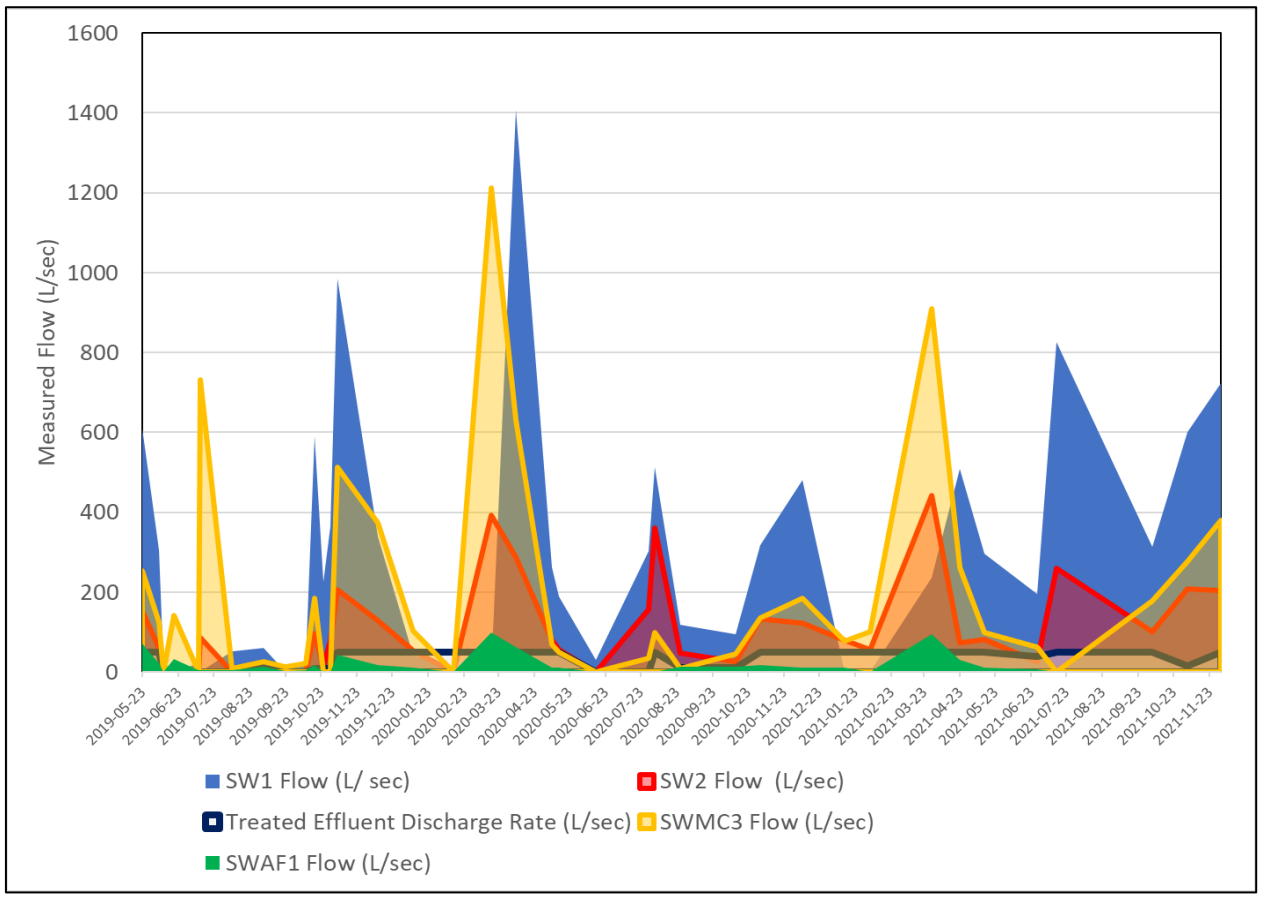
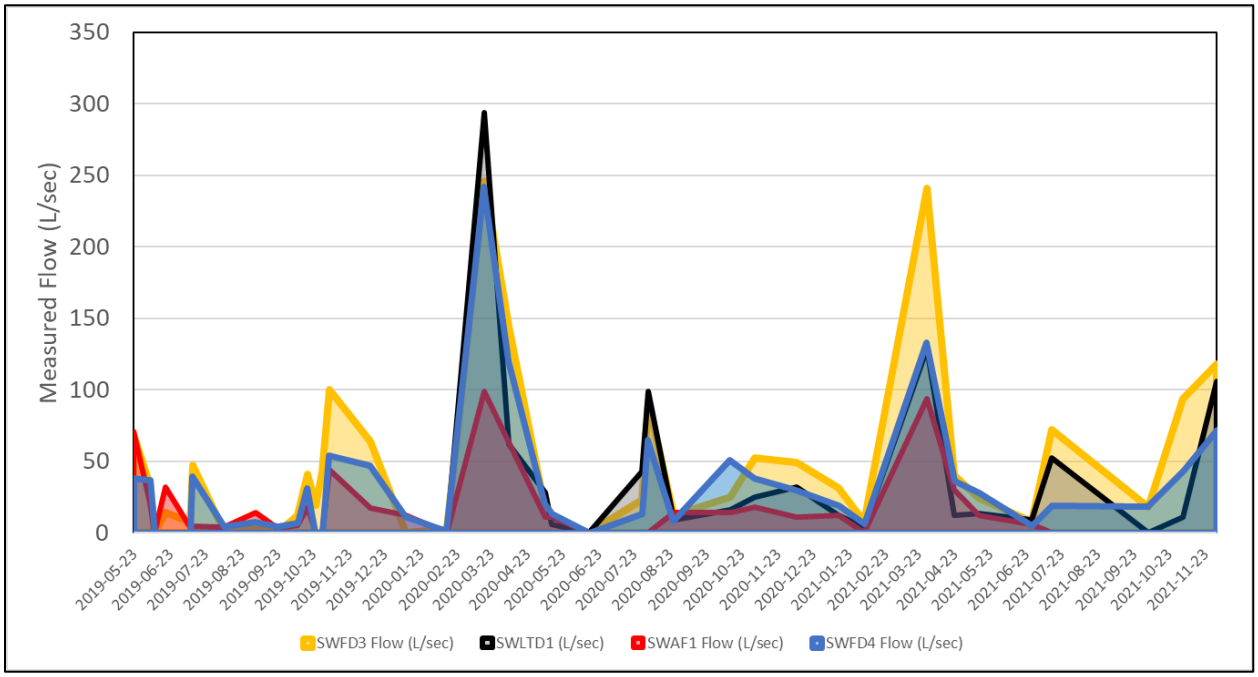


Figure 5 Comparison of Contributing Flows to SW from Different Sources Including SW2, SWMC3 and SWAF2 as well as the Effluent Discharge that is Incorporated into Flows at SW2 and SW1 (May 23, 2019 to Dec. 3, 2021)



4.4. Continuous Water Level/Flow Measurements at SW1

4.4.1. Rating Curve Development

CanDetec (2021) completed a review of the hydrologic data assembled for Moose Creek and developed long-term flow estimates through modeling with a surrogate watershed. The information below is taken from the earlier report.

To calculate stream flow based on water levels, it is necessary to develop a rating curve using measured spot flows at the stream gauging location and measured water levels at the well. A preliminary rating curve was developed from data for the period of May 23, 2019, through to May 14, 2020, based on 14 flow measurements. The rating curve was updated with additional 2020 and 2021 flow measurements (period of record data from May 23, 2019 to May 14, 2021) for the 2021 low-flow season based on a total sample size of 23. Both rating curves are illustrated in Figure 4. Except for the hydrograph illustrated for the 2020 season in Figure 5, flow measurements in this report are based on Rating Curve 2. A power function fit the data set best with a correlation coefficient (r^2) = 0.8054. This equation, which accounts for 80% of the variability in the estimated flow is explained by these water levels.

The equation

$$Y = 1234\ X^{5.2074} \quad (1)$$

was used for flow calculations at MCSW1 throughout 2021.

Due to the relocation of the logger in the spring of 2020, it was necessary to use water levels in the rating curve based upon the water depth measurements taken during stream gauging in 2019. As the Moose Creek channel at MCSW1 is a broad "U" shape, the water levels for the 8 central stream flow measurement verticals (verticals 4 to 11) were averaged to consider variability in channel morphology. The averaged water levels were compared to the measured water level from the logger. Although limited to 13 data points, the correlation between the two sets of measurements is excellent based on the comparison with the 1:1 relationship line and $r^2 = 0.98$ shown in Figure 5. Based on this, the approach of integrating both water level measurements from the in-stream logger in 2019 and the water levels measured in the well is valid and the incorporation of all points in the calibration is appropriate.

Figure 6 Rating curves developed for MCSW1 for a preliminary rating curve and for the 2021 rating curve based on all available data

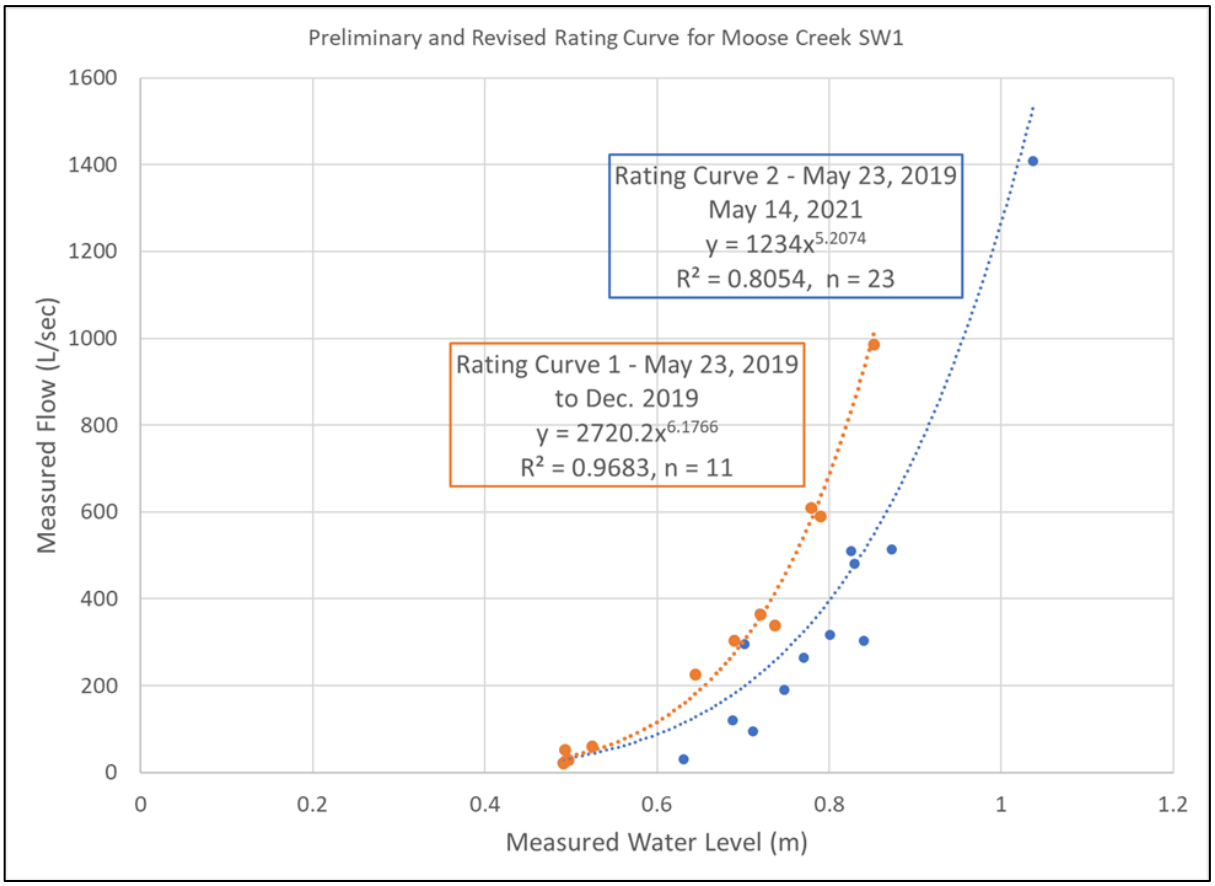
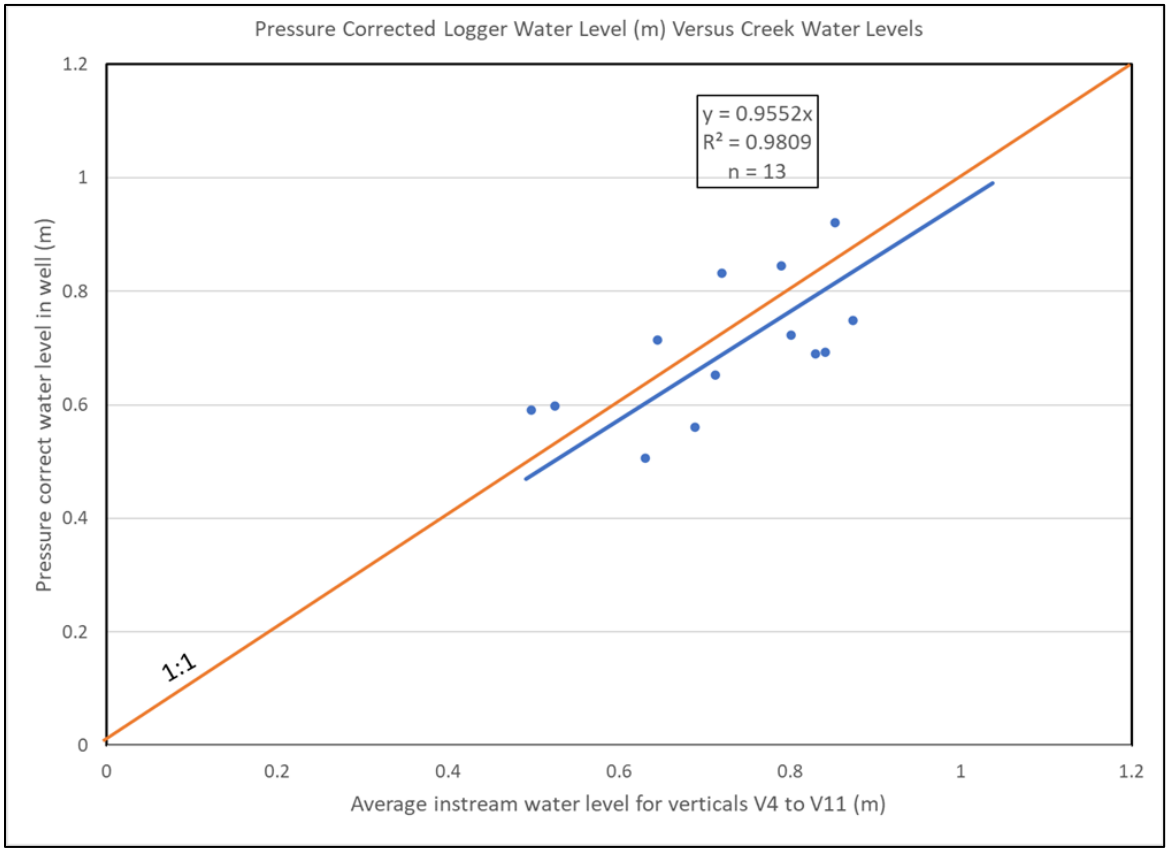


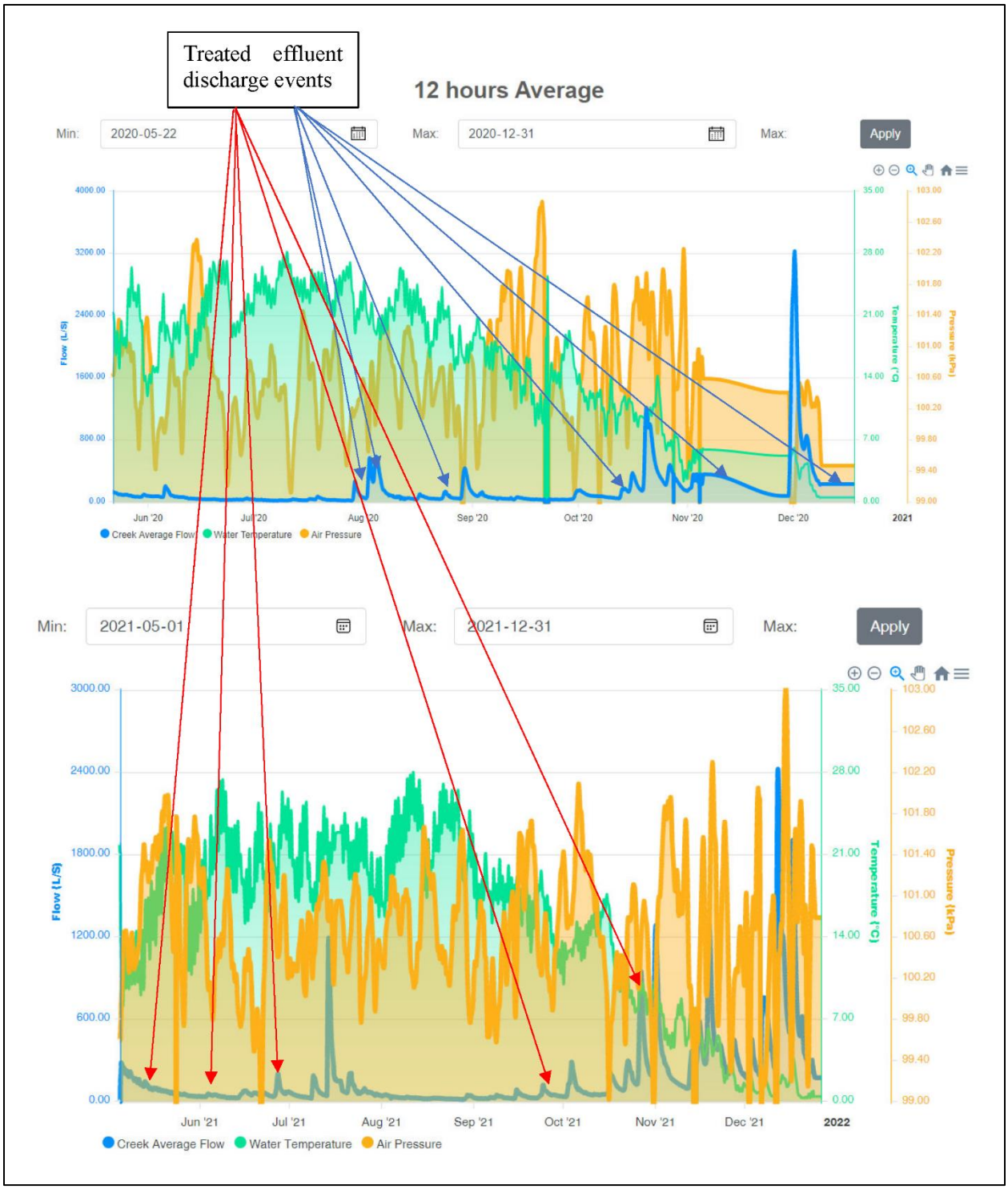
Figure 7 Pressure corrected water levels in Moose Creek at MCSW1 compared to average water depths from central eight stream gauging verticals (V4 to V11)



4.4.2. Hydrographs

The resultant hydrograph for 12-hour averaged flows and associated information are illustrated for the 2020 and 2021 low-flow season in Figure 8. The hydrograph utilizes the preliminary rating curve shown in Figure 6 and is provided here as this curve has been used in previous publications including the EOWHF annual report for 2020 (TetraTech, 2021). The comparable hydrograph for the 2021 season to the end of December 2021, is also shown in Figure 6 along with an indication of the treated effluent discharge events. The hydrograph for 2021 is based on the updated rating curve in Figure 6.

Figure 8 Estimated Flow and Water Temperature in Moose Creek at SW1 between May 22 and December 31, 2020 and May 1 to December 31, 2021



4.4.3. Modelled Long Term Discharge Estimates at SW1

CanDetec (2021) documented the modeling that was undertaken to develop long term discharge estimates for Moose Creek at SW1. This is necessary as Moose Creek has less than 3 years of continuous water level records. Historic discharge estimates were based on an appropriate surrogate water course. This water course requires extensive flow records that characterize average conditions, is nearby and is reasonably comparable to the Moose Creek watershed with respect to topography, vegetation, soils and current land use The watershed area at SW1 is approximately 61.6 km^2 based on watershed area delineation by GIS or 57 km^2 estimated from the Ontario Flow Assessment Tool ({OFAT}, Ministry of Natural Resources and Forestry (https://www.lioapplications.lrc.gov.on.ca/OFST/).

The surrogate watercourse selected was the Payne River near Berwick (02LB022). Payne River and Moose Creek are compared in Table 10.

Table 10 Comparison of watershed and land use attributes for Moose Creek at MCSW1 and Payne River near Berwick

(Source: Ontario Flow Assessment Tool ({OFAT}, Ministry of Natural Resources and Forestry https://www.lioapplications.lrc.gov.on.ca/OFST/) (CanDetec, 2021)

Watershed Attribute – Physical	Moose Cr. At MCSW1	Payne R. near Berwick
Drainage area (km^2)	57.29	133.25
Length of main channel (km)	21.85	35.49
Slope of main channel (m/km)	2.16	1.59
Slope of main channel (%)	0.216	0.159
Area lakes/ wetlands (km^2)	13.04	28.11
Mean slope (%)	1.68	1.80
Mean Annual precipitation (mm)	1025	1015

Land Use Attributes	Moose Cr. At MCSW1	Payne R. near Berwick
Wetlands, marsh, swamp (km^2)	12.23	27.75
Wetlands, marsh, swamp (%)	27.35	20.83
Treed (km^2)	6.62	16.45
Treed (%)	11.53	12.35
Community Infrastructure (km^2)	1.49	4.19
Community Infrastructure (%)	2.61	3.15
Agriculture and Undifferentiated Rural (km^2)	36.28	84.14
Agriculture and Undifferentiated Rural (%)	63.33	63.19

The Moose Creek and Payne River watersheds above the gauge near Berwick are both headwater systems. Although the Payne River watershed is double the size of Moose Creek upstream of SW1, many of the other attributes are quite comparable. The length of the main channel of Payne River is longer and the slope is lower than Moose Creek. The mean slope of both watercourses, as a percent, is similar at 1.68 and 1.80 for Moose Creek and Payne River, respectively. Average annual precipitation is essentially identical (CanDetec, 2021).

Land use attributes are also generally similar. Wetlands, marsh and swamp combined comprise a somewhat greater percentage of the land area in Moose Creek than for the Payne River (27% versus 21%, respectively). Area covered with all types of trees are equivalent as is agriculture which represents 63% of land use in both watersheds (CanDetec, 2021).

4.4.4. Flow Characteristics for Payne River near Berwick (02LB022)

As described in CanDetec (2021) Flow data recorded for the Payne River near Berwick at five-minute intervals were downloaded from WSC (https://wateroffice.ec.gc.ca/mainmenu/real_time_data_index_e.html) from January 1, 2021 to September 5, 2021. These data were summarized to daily mean discharge for comparison with the historic daily mean flow data also recovered from WSC from 1976-04-01 through to 2020-12-31. Flow data are not available for this location from 1997-04-01 to 2003-03-31. Nevertheless, the available data fully describe average flow conditions for this location. Payne River has extreme daily flows that have ranged from a minimum of 3 L/sec to nearly 30,000 L/sec (30 m^3/sec). Peak flows occur in the spring (March through April) thereafter showing a consistent decline into the summer period with daily mean flows at less than 100 L/sec beginning in mid-July and continuing through to the end of September. Flow rises again in the fall peaking in early December and then declining during the winter. Extreme low flows have been observed during the summer of 2021 with daily mean flows during late August declining to as little as 1 L/sec.

4.4.5. Derivation of estimated (synthetic) flows for Moose Creek at MCSW1

CanDetec (2021) discussed at length the development of the discharge relationship between the two water courses to permit the derivation of synthetic long term flow records for Moose Creek. It is important to note that SW1 is downstream of the discharge of the treated effluent from the EOWHF. Consequently, the documented effluent discharge rate was subtracted from the flow rate at SW1, where appropriate. The focus at Moose Creek SW1 is on low flows up to 250 L/sec exclusive of effluent discharge or up to 300 L/sec inclusive of maximum effluent discharge. Consequently, a relationship restricting the range of flows to less than 400 L/sec at SW1 is appropriate to simulate long term flows for corresponding flows from Payne River. A strong relationship characterized by a linear equation was derived. This relationship was further refined to address the fact that the intercept of the Y-axis or the predicted flow at SW1 (37 L/sec at SW1 when flow in Payne River is negligible) is likely over-estimated. Flows for both systems when flows were less than or equal to 40 L/sec (assumed to be representative of baseflow conditions) suggested that the baseflow intercept is more likely of the order of 20 L/sec.

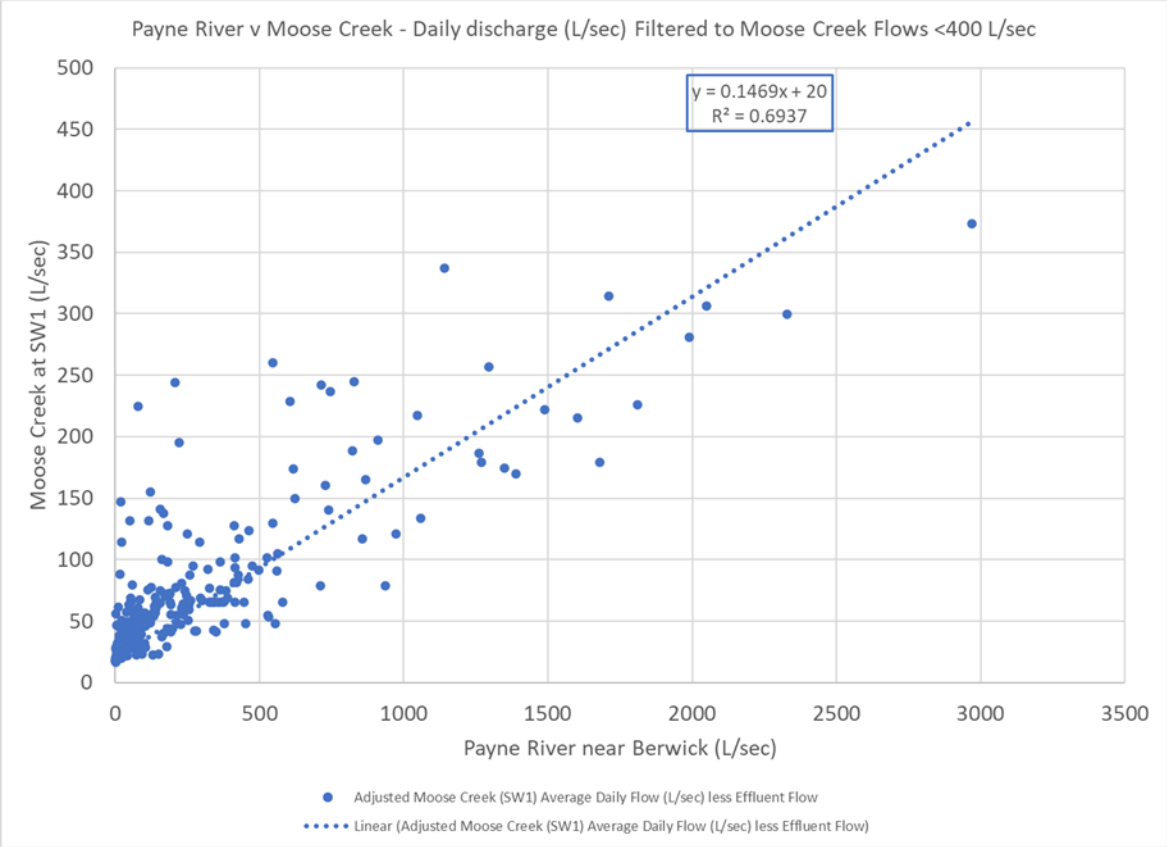
Forcing the intercept for the prediction of the Moose Creek flow from the measured discharge for Payne River results in equation 1 (Figure 9):

$$Y = 0.1469X + 20 \quad (R^2 = 0.6934) \qquad (1)$$

This equation was used to estimate low flows in Moose Creek at SW1. Because the intercept is a constant, its effect decreases as the flow increases. This equation predicts 60 L/sec in Moose Creek at SW1 (± 1.1 L/sec) at the corresponding Payne River flow of 273 ± 7 L/sec at a 95% confidence interval at N = 299.

While the confidence interval range increases with increasing discharge, the range expressed as a percent of the estimated Moose Creek flow decreases with increasing discharge (CanDetec, 2021).

Figure 9 Linear relationship developed between Payne River and Moose Creek based on Moose Creek flows less that 400 L/sec with Y-intercept set at 20 L/sec (CanDetec, 2021)



4.4.6. Moose Creek at SW1 Low Flow Statistics

The Ontario Flow Assessment Tool (OFAT) (https://www.lioapplications.lrc.gov.on.ca/OFAT/) estimates low flow statistics for watercourses in Ontario. The Graphical Index Method (GIM) was used for Moose Creek at SW1 and provided a 7Q20 of 60 L/sec. Based on the ongoing measurements in the Moose Creek watercourse, the 7Q20 estimate from OFAT appears to be elevated possibly as a result of the extensive development of surface and subsurface agricultural drainage and the deforestation and peat mining that has continued for years in the watershed. Similarly, the GIM provides a 7Q20 for Payne River near Berwick of 90 L/sec, which, based on equation (3), estimates the Moose Creek SW1 7Q20 at 33 L/sec. Further discussion of the limitation of low flow statistics is provided in CanDetec (2021).

The 30 plus years of computed flow data for Moose Creek based on Equation 3 applied to the WSC measured flow data for Payne River were assessed by CanDetec (2021) using the US Army Corps of Engineers, Hydrologic Engineering Center Statistical Software Package (HEC-SSP) version 2.2 (June 2019). The cumulative probability of estimated flows in Moose Creek at SW1, between June 1 and November 1, revealed flows of 30 L/sec or less account for 42% of the counts, flows of less than or equal to 60 L/sec account for nearly 75% of the counts (i.e., only 25% of the counts are greater than 60 L/sec) and 100% of the flows between June 1 and November 1 are less than 100 L/sec.

A low flow frequency analysis was also performed by CanDetec (2021) on the Moose Creek data set for the full year of simulated data for the period of record using HEC-SSP. Selecting a 7-day duration and return periods of 2, 5, 10 and 20 years, produced low flows shown in Table 11. It is evident that the OFAT GIM for Moose Creek (60 L/sec) severely over-estimates the 7Q20 statistic. The 95% confidence limit for the 7Q2 statistic ranges from 4.5 to 27.1 L/sec. Based on these calculations, Moose Creek could essentially be dry (Q < 2 L/sec) for 7 days within 20 years while over the shorter term, minimum flows of the order of 20 L/sec represent a high frequency event (return period of 2 years).

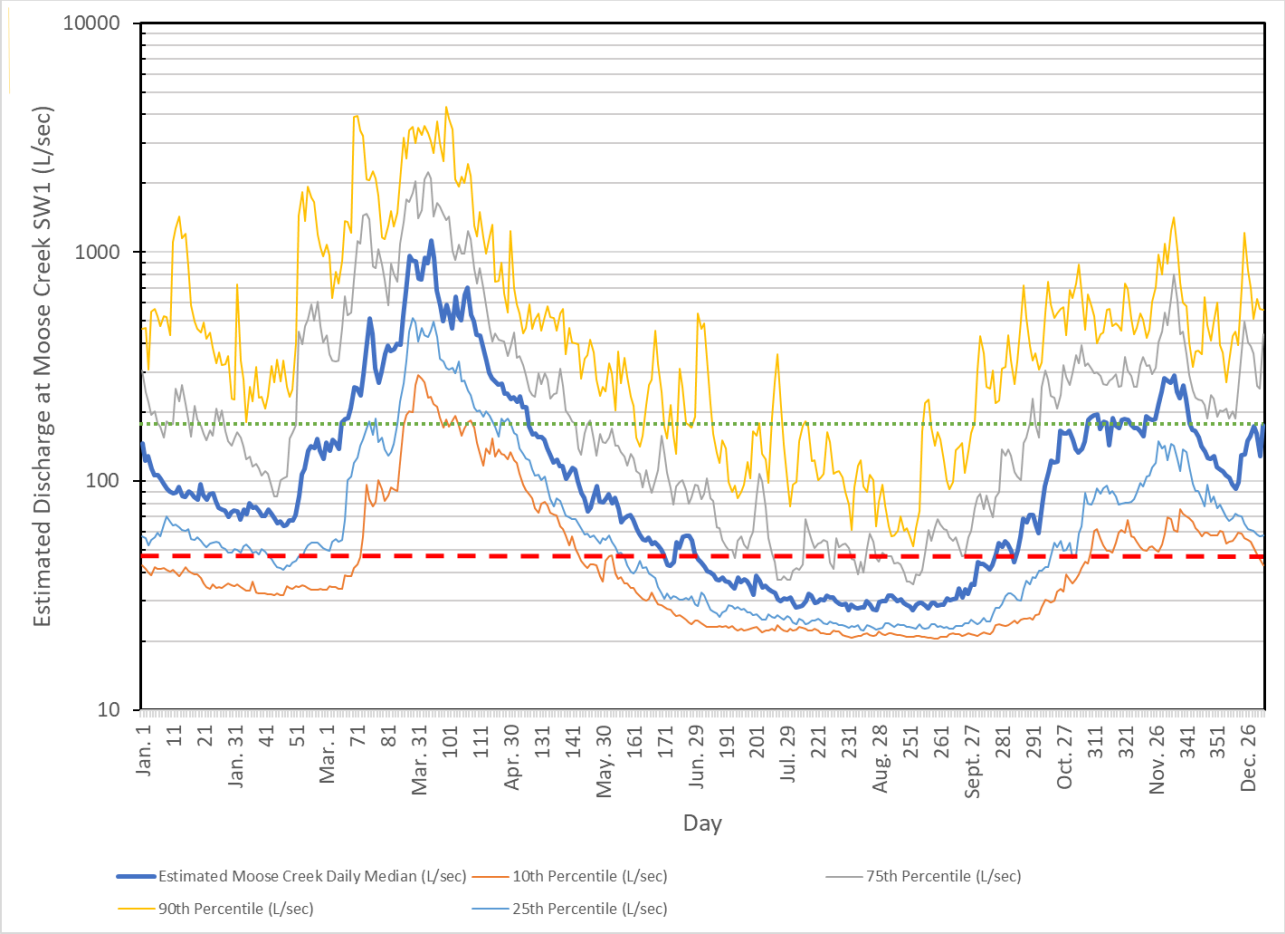
Table 11 Estimated Computed Flow of Seven Day Duration For 2, 5, 10 and 20 Year Return Periods with 95% Confidence Limits (USACE, 2019)

Computed Flow (L/sec)	Return Period (Years)	95% Confidence Limit (L/sec)	Range (L/sec)
15.8	2	11.3	4.5 – 27.1
5.4	5	3.5	2.1 – 8.9
3.0	10	1.8	1.2 – 4.8
1.8	20	1.0	0.8 – 2.8

4.4.7. Estimated Long-Term Daily Median and Percentile Flows for Moose Creek at SW1

CanDetec (2021) calculated estimated daily mean flow conditions for Moose Creek at SW1 based upon long-term flow records for Payne River near Berwick (Figure 10). Median and 10th, 25th, 75th and 90th percentiles. As shown in Figure 10, daily mean flows are consistently above 60 L/sec by late October, based on the estimated median flow.

Figure 10 Median, 90th, 75th, 25th and 10th Percentile Discharge Estimates for Long Term Estimated Daily Mean Flows at Moose Creek (SW1) Showing Critical Flow of 60 L/sec



4.5. Historic Quality of the Receiving Waters

4.5.1. Water Quality Sampling Station Selection

This report, consistent with the primary existing conditions report (CanDetec 2022) continues to consider only long-term stations generally with year-round flow that represent conditions above and below the effluent discharge location. Specifically, the following stations will be considered in detail SWFD4, SWFD3, SWFD2, SW2, SWMC1, SWMC2, SWMC3, SW1, SWAF1 and SWLTD1. These are located in Figure 2 and described in the primary existing conditions report (CanDetec 2022).

In order to focus this report, the key water quality variables of greatest relevance to impacts from the treated landfill leachate will be discussed as well as other selected water quality variables. This is

consistent with the primary existing conditions report (CanDetec 2022). These have been selected either due to the ECA and the concern of the treated effluent discharge causing high concentrations in the receiving waters or due to naturally high background concentrations of certain water quality variables in the receiving waters. The specific water quality variables discussed in detail in this report and their accepted PWQO or other water quality guideline are listed in Table 12. The analytes that are in "red" will be discussed at length as other water quality variables are in compliance with the appropriate objective or guideline or do not have an objective.

Table 12 Water Quality Analytes Considered in this Assessment. Key Variables and Objectives or Guidelines in "Red"

Analyte	Provincial Water Quality Objective (PWQO)	Method Reporting Limit	Effluent Limit	PWQO (APV for Na)#	CCME* Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC** Surface Water Quality Guideline - Short/Long Term (mg/L)
Al (dissolved) (mg/L)	0.075*	0.01				
As (mg/L)	0.1	0.001				
B (mg/L)	0.2*	0.01			29/1.5	ND/**1.2**
Benzene (µg/L)					ND/370	ND/40
CBOD5 (mg/L)	1	10.0				
Cd (mg/L)	0.0002*	0.0001			.001/.00009	calculation
Cl (mg/L)		1			640/**120**	600/150
Co (mg/L)	0.0009	0.0002				0.110/0.004
COD (mg/L)	5					
Conductivity (µmhos/cm)	5					
Cr (mg/L)	0.0089**	0.001			ND/.001	
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/**≤0.002**
DOC (mg/L)	0.5					
Fe (mg/L)	**0.3**	0.03	1.0		ND/0.3	0.001/ND
Hardness as CaCO3 (mg/L)	1					
Hg (mg/L)	0.0002	0.0001			ND/.000026	ND/calculation
Na (mg/L)		2		**180**		
NH_3 -N (mg/L)	**0.02**	1.0	1.0			

Analyte	Provincial Water Quality Objective (PWQO)	Method Reporting Limit	Effluent Limit	PWQO (APV for Na)#	CCME* Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC** Surface Water Quality Guideline - Short/Long Term (mg/L)
NH_3 -N (Un-ionized – calculated) (mg/L)	0.02					
NO_3-N (mg/L)		0.10			124/**3.0**	32.8/**3.0**
P – Total (mg/L)	**0.03**	0.01	0.3	0.03		
Pb (mg/L)	0.025	0.001		0.025	ND/.007	0.003/ND
pH	6.5-8.5					
Phenols (mg/L)	0.001	0.001	0.005	0.001	ND/0.004	.050/ND
Se (mg/L)	0.1	0.001				
SO4 (mg/L)		1				**429**
TDS (COND – CALC) (mg/L)	5					
Toluene (µg/L)				0.8	ND/.002	ND/0.0005
Total Kjeldahl Nitrogen (mg/L)	0.10					
Total Suspended Solids (mg/L)	2	10.0				
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075

* CCME (Canadian Council of Ministers of the Environment) (various dates)

** BCMOE, (Ministry of Environment of British Columbia), 2018

APV (Aquatic Protection Values as prescribed by MECP)

4.6. Description of Historic and Existing Water Quality and Quantity in Fraser Drain

The three stations selected for evaluation in Fraser Drain were SWFD4, SWFD3 and SWFD2. The relevance of each of these stations is discussed in the primary existing conditions report (CanDetec 2022) and is not repeated here.

As there is no direct impact of treated leachate discharge to Fraser Drain, data for each of SWFD2, SWFD3 and SWFD4 have been treated as a single data set prior to May 23, 2019, to characterize background water quality upstream of the effluent discharge location (Group A) (Table 13). Due to the fact that the sampling regime was altered significantly commencing May 23, 2019, the data since this date (Group B) have been summarized separately to account for the increase in sampling frequency over this 18 month period. The data for all stations for key variables are summarized and compared with Water Quality Objectives (PWQO) (MOEE, 1999), Canadian Council of Ministers of Environment (CCME)

surface water quality guidelines and/or Environment British Columbia's Ministry of Environment's (BCMOE) surface water quality guidelines in Table 13 and for all variables in Appendix D.

The information from Table 13 indicates that upstream water quality degrades marginally downstream with median concentrations of TP and Fe frequently exceeding the PWQO. The 90th percentile statistics for both Group A and B for NO_3-N exceed the CCME long term guideline at all locations. Poorest water quality is generally associated nwith low flow conditions or periods of stagnation in the Fraser Drain.

In general, median concentrations for SWFD3 Group B (2019-05-23 to 2021-12-03) have increased noticeably for:

- Cl (17.0 to 30.0 mg/L for Group A and B respectively);
- Na (12.0 to 16.0 mg/L for Group A and B respectively);
- NO_3-N (0.96 to 2.32 mg/L for Group A and B, respectively);
- P-Total (0.050 to 0.081 for Group A and B, respectively); and,
- SO_4 (33.0 to 53.0 for Group A and B, respectively).

A time series comparison of selected water quality variables for Stations SWFD4. SWFD3 and SWFD2 for the period of record is provided in Figure 11. In-stream flows on the date of sampling are presented with these data, when available. In general, time trends[5] are not highly evident although increased concentrations are suggested for SO_4, Cl, Fe, Na and NH_3-N and TP at most of the sample locations. The high variability over time with these samples is likely associated with flow but there are insufficient data to assess the effects of low and high flows on water quality.

Time series plots for all data from SW2-3A/SWFD2 from 2005 through to December 2021 (Figure 11) suggest that concentrations are increasing in Fraser Drain with time upstream of the treated leachate effluent discharge location except for Cu which remains at very low concentrations. The up-ward trends are most noticeable for SO_4, Cl, Fe, B, Na, NH_3-N, NO_3-N and TP. The trend lines are illustrative only due to the vary low correlation coefficients determined for the lines. Median concentrations between the two time periods (Group A from 2005-11-30 to 2019-5-8 and Group B from 2019-5-23 to 2021-12-03) for SWFD2 indicate that boron has increased from 0.040 to 0.070 mg/L, Cl from 17 to 30 mg/L, Na from 14 to 19 mg/L, NO_3-N from 1.080 to 2.63, P-Total from 0.110 to 0.181 and SO_4 from 32 to 61 mg/L. These upward trends in Fraser Drain cannot be attributed to impacts from the landfill operation but are indicative of general trends due to agricultural activities in the watershed or are related to the increased sampling frequency since May 23, 2019, resulting in better characterization of conditions year-round.

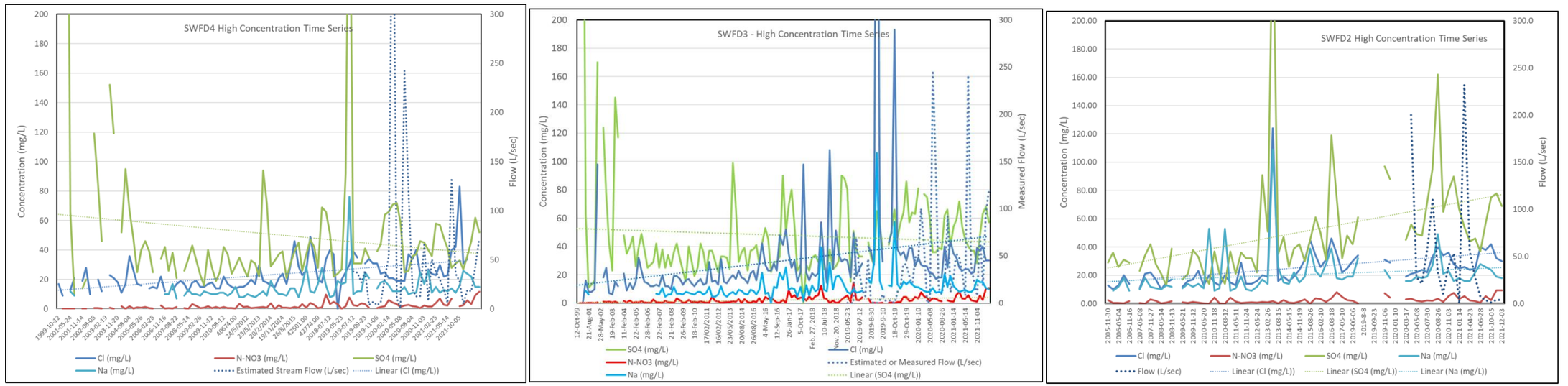
[5] *Linear time series lines are included for selected variables in the figure but the equation has not been determined or the significance of the line due to the high variability in the data. The time series lines are intended to be a general indication only.*

Table 13 Summary Water Quality Statistics (median, 90th percentile, count above detection limit) for Selected Variables for Fraser Drain Background Stations SWFD4, SWFD3 and SWFD2 for Key Water Quality Variables.

(Group A includes all data to 2019-05-08 and Group B includes all data from 2019-05-23 to 2021-12-03) (ND = no data)

Analyte (mg/L)	Effluent Limit	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline – short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWFD4 Group A Median / 90th Percentile (n)	SWFD3 Group A Median / 90th Percentile (n)	SWFD2 Group A Median / 90th Percentile (n)		SWFD4 Group B Median / 90th Percentile (n)	SWFD3 Group B Median / 90th Percentile (n)	SWFD2 Group B Median / 90th Percentile (n)
B		0.2	29 / 1.5	ND / 1.2	0.010/0.020(40)	0.030/0.066 (73)	0.040/0.100 (43)		0.020/0.020 (32)	0.030/0.071 (47)	0.070/0.175 (24)
Cl			600 / 150	600 / 150	17.5/31.2 (68)	17.0/39.8 (93)	17.0/33.4 (43)		30.0/40.0 (31)	30.0/44.2 (47)	30/40 (25)
Cu	0.2		ND / 0.004	0.029 / ≤0.002	0.001/0.002 (36)	0.002/0.006 (75)	0.002/0.003 (39)		0.001/0.002 (21)	0.002/0.004 (47)	0.002/0.005 (23)
Fe	1.0	0.3	ND / 0.3	0.001 / ND	0.27/0.44 (67)	0.340/0.904 (93)	0.410/1.184 (43)		0.290/0.474 (32)	0.270/0.893 (47)	0.35/1.09 (25)
Na		180			11/18 (49)	12/26 (69)	14/38 (42)		14.5/24.9 (32)	16/27 (43)	19/30 (25)
NH_3-N	1.0				0.050/0.114 (59)	0.090/0.247 (82)	0.115/0.540 (40)		0.037/0.121 (17)	0.050/0.251 (36)	0.161/0.829 (20)
NO_3-N			124 / 3.0	32.8 / 3.0	0.89/3.38 (64)	0.960/4.433 (90)	1.080/3.904 (39)		2.47/6.88 (32)	2.32/7.34 (43)	2.63/7.44 (24)
Un-ionized ammonia		0.02			0.001/0.005 (27)	0.002/0.007 (78)	0.001/0.021 (40)		0.001/0.005 (13)	0.001/0.008 (26)	0.005/0.021 (17)
TP	0.3	0.03			0.034/0.077 (64)	0.050/0.223 (88)	0.110/0.294 (43)		0.029/0.081 (32)	0.081/0.177 (46)	0.181/0.662 (25)
SO_4				429	34/85 (69)	33/79 (93)	32/59 (43)		41/64 (32)	53/70 (46)	61/93 (25)

Figure 11 Time Series of Surface Water Quality for SWFD4, SWFD3 and SWFD2 for "High Concentration Time Series" (Cl, Na, NO_3-N and SO_4) and "Low Concentration Time Series" (Boron, Cu, Fe, NH_3 -N and P-total) as well as Discharge (m^3/sec)



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4.6.1. Water Quality of Fraser Drain Downstream of Treated Effluent Discharge Location

4.6.1.1. Leachate Quality

Detailed data for leachate quality of the Effluent Holding Ponds (EHPs) to confirm quality and compliance with effluent limits are reported annually in the EOWHF Annual Monitoring Reports and are discussed in Section 2.4. In 2019 the effluent met the ECA compliance limits with limited exceptions including phenols (1), TP (1) and TSS (5). In 2020 and 2021, the effluent was in compliance with all ECA limits at the time of discharge. However, a number of water quality variables in the treated effluent result in exceedances of various water quality objectives or guidelines used to characterize surface waters in Ontario. These variables include B, Cl, Na and NO_3-N. Other variables that have high background concentrations naturally in Moose Creek and Fraser Drain will be considered including Cu, Fe, TP, and phenols. These variables will provide the basis for the discussion with respect to existing water quality conditions.

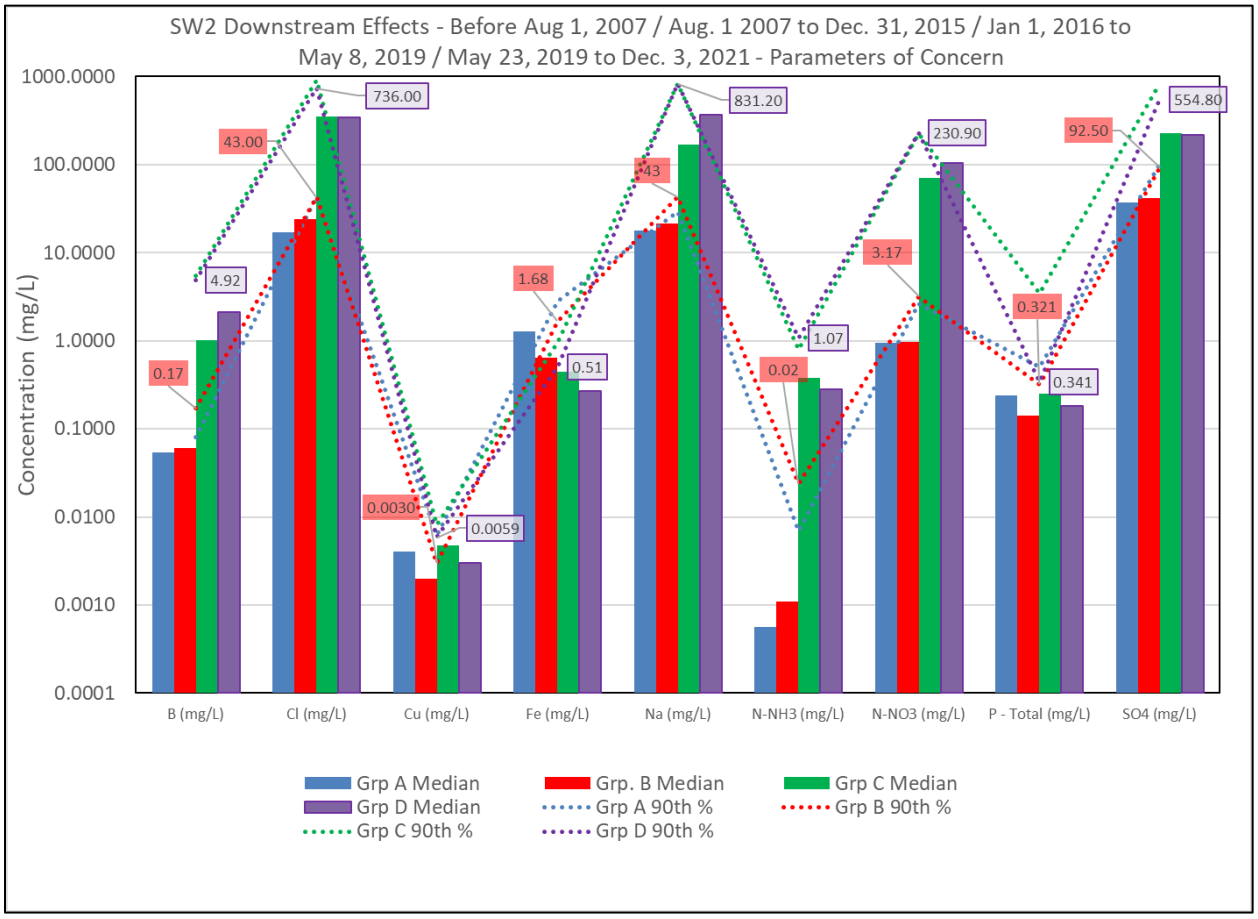
4.6.1.2. Quality of Receiving Water at SW2 Downstream of Treated Effluent Discharge

SW2 is located proximally downstream of the effluent discharge with data covering July 12, 1996 to Dec. 3, 2021. Selected data (median and 90th percentile for key variables) are presented in Figure 12 for four time periods, namely i) before treated effluent discharge (pre 2007-08-01), ii) early leachate treatment discharge (2007-08-01 to 2015-12-31), iii) the period after the most recent upgrades to the LTF in 2015/2016 that ranges from January 2016 through to May 8, 2019, and finally, iv) recent discharge linked sampling from May 23, 2019 to Dec. 3, 2021.

Figure 12 shows data for selected water quality parameters while all available data are summarized in Appendix D. It must be remembered that the surface water samples from SW2 have been taken generally independent of effluent batch discharges (this will be addressed further below) prior to May 23, 2019 and accordingly, the samples prior to May 2019 do not necessarily demonstrate an effect of the treated leachate on the surface waters. Rather, samples prior to May 23, 2019 are likely indicative of pre-landfill existing conditions. Any trend in water quality generally prior to May 23, 2019 may show a residual impact of treated leachate pooling in Fraser Drain under low flow conditions. As flow data were not collected at the time of water quality sampling prior to May 23, 2019, it is not possible to differentiate the water quality samples based on flow conditions, so data have been pooled based on the time periods noted above rather than flow in the creek.

Figure 12 Median and 90th Percentile for Key Water Quality Variables for SW2 for Four Time Periods

(Group A: Pre-August 1, 2007, Group B: August 1, 2007 to Dec. 31, 2015, Group C: January 1, 2016 to May 8, 2019 and Group D: May 23, 2019 to December 3, 2021).(Labels show 90th percentiles for Groups B and D)



There has been a minor increase in B concentrations at SW2 until Dec. 31, 2015, but both Groups C and D median values show an increase of one order of magnitude over the background periods. After May 23, 2019, water samples at SW2 have coincided with treated effluent discharge events with a median boron concentration of 2.1 mg/L. Median boron concentrations for Group C data were 1.8 mg/L which is highly comparable to the Group D median suggesting an influence from the effluent discharge on boron concentrations for samples from Group C (January 1, 2016 through to May 8, 2019). The 90th percentile concentrations for boron show a steady rise across all four time periods, starting at 0.080 mg/L, rising two orders of magnitude in Group B to 1.12 mg/L, and rising again in Group C to 6.196 but declining for Group D to 4.92. Median boron concentrations at SW2 currently during effluent discharge are more than double the long-term guideline of 1.2 mg/L (BCMOE, 2018).

Background median Cl concentrations have increased from a range 16 to 26 mg/L (i.e., prior to January 1, 2016) to 204 and 360 mg/L for Group C (2016-01-01 to 2019-05-08) and Group D (2019-05-23 to 2020-12-09), respectively. The 90th percentile concentrations have increased by an order of magnitude from 43 to 736 mg/L for Groups A and D, respectively, indicating the effect of the effluent discharge on water quality at SW2. During discharge events, Cl concentrations commonly exceed the CCME long term guideline of 120 mg/L. The median Cl concentration at SW2 for Groups C and D are also in excess of the CCME long term guideline of 120 mg/L, while the 90th percentiles for these two groups exceed the CCME short term guideline for Cl of 600 mg/L.

Sodium concentrations are also elevated at SW2 during effluent discharge events. The historic median concentration, Groups A and B (prior to Dec. 31, 2015) were 18 and 22 mg/L respectively. These jumped to 170 and 372 for Groups C and D, respectively. The median concentrations of Na (372 mg/L) from May 23, 2019 through to the end of 2021 exceeded the MECP Aquatic Protection Value (APV) of 180 mg/L while the 90th percentile for this period was 831 mg/L.

NO_3-N also increased markedly at SW2 since January 1, 2016 relative to historic concentrations. Historic median concentrations for Groups A, B and C were similar at 0.96, 0.96 and 0.25 mg/L, respectively. When samples were collected in association with discharge events in group D, the median jumped to 106 mg/L. This two orders of magnitude increase is related to the discharge of the treated effluent. The median concentration over the past 32 months is an order of magnitude above the CCME surface water quality long term guideline of 3.0 mg/L. The 90th percentile for the Group D period from May 23, 2019 to Dec. 3, 2021 of 231 mg/L is about double the CCME short term guideline of 124 mg/L.

Sulphate (SO_4) mean concentrations have increased by an order of magnitude from historic conditions to those indicative of treated effluent discharge. Prior to the end of December 2015, historic mean concentrations were 53 and 61 mg/L for Groups A and B, respectively. After January 2016, mean concentrations for Groups C and D were 227 mg/L and 219 mg/L, respectively. With the onset of effluent discharge and most noticeably since water quality measurements have been associated with discharge events, median concentrations for all four Groups were less than the BCMOE guideline of 429 mg/L; however, the 90th percentiles for Groups C and D at 833 and 554 mg/L both exceeded the BCMOE guideline of 429 mg/L (BCMOE, 2018).

As seen in Figure 12, Cu, Fe and TP do not show a significant impact from the leachate discharge or actually show an improvement in water quality for Fe at SW2. Cu concentrations are low in the effluent and the median of Group D is comparable to historic measurements.

Median concentrations of ammonia have increased by an order of magnitude in the surface waters for Group C and D samples which were 0.38 and 0.28 mg/L, respectively. The effluent concentration of NH_3-N has remained below the ECA limit of 1.0 mg/L throughout 2021. Un-ionized ammonia is the form of concern with a PWQO for un-ionized ammonia of 0.02 mg/L. Median and 90th percentiles for un-ionized ammonia were not reported prior to the Group C period (January 1, 2016 to May 22, 2019) but were reported as 0.042/2.042 and 0.002/0.013 for Groups C and D, respectively. While un-ionized ammonia occasionally exceeded the objective during the period from August 1, 2007 through to May 8, 2019, there were no occasions from May 23, 2019 through to the end of December 2021 that the un-ionized ammonia objective was exceeded.

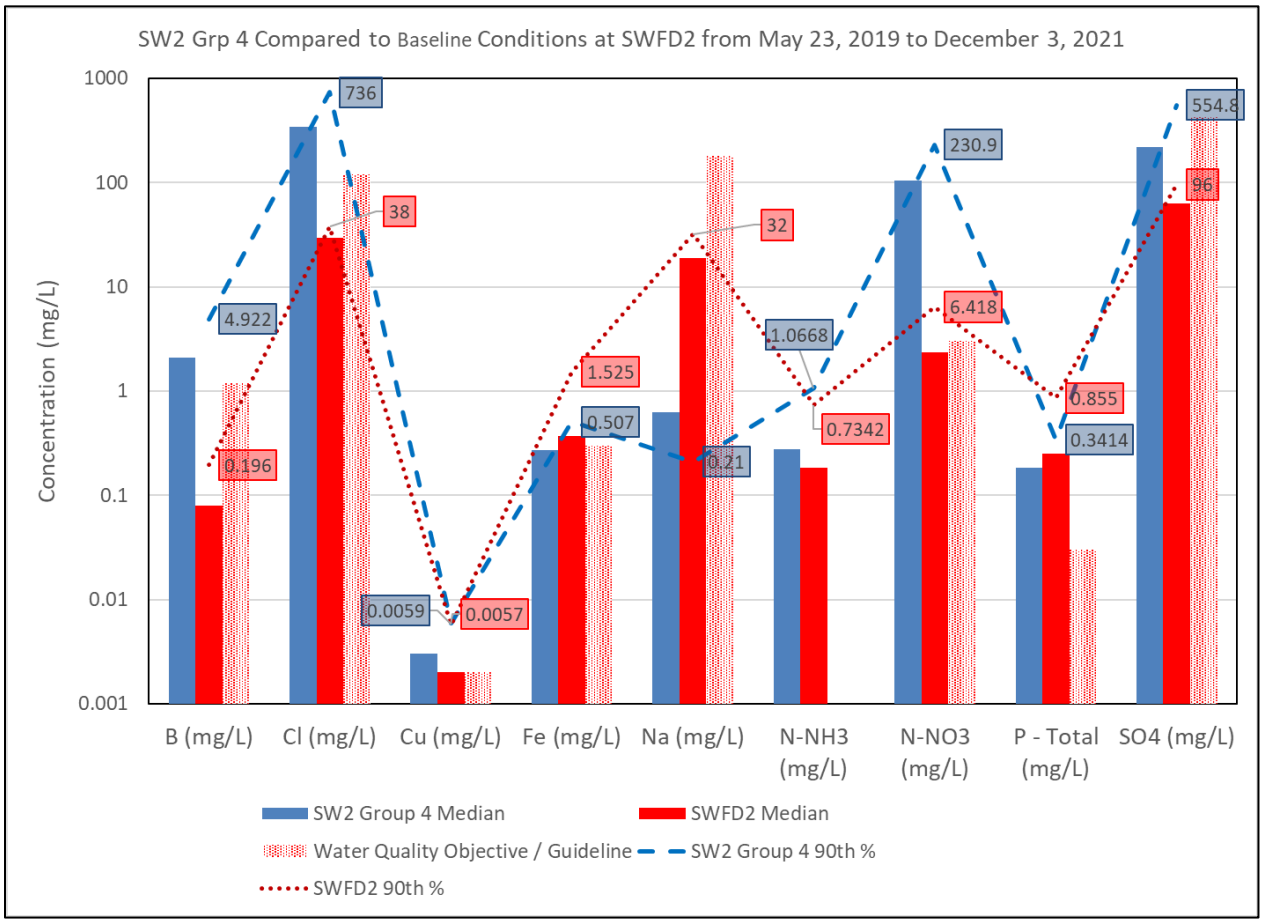
TP in the receiving waters at SW2 have actually decreased over time as a result of the enhanced treatment of the effluent for phosphorus. Median concentrations for each group of data have declined from 0.240, 0.140, 0.250 and 0.183 mg/L for Groups A through D, respectively. Although the concentrations have decreased, they remain an order of magnitude in excess of the PWQO for TP of 0.03 mg/L due to upstream conditions as exemplified by median and 90th percentile concentrations for TP from 2019 through 2021 0.110/0.294 mg/L at SWFD2.

Since May 23, 2019, samples have been collected at all locations on Fraser Drain during treated effluent discharge and flow measurements have been made, if possible to do so. Accordingly, data since May 23, 2019 have been compared to conditions at SWFD2 upstream of the treated effluent discharge location for this time period in Figure 13.

Consistent with the temporal observations noted above for SW2, the treated effluent discharged to Fraser Drain results in significantly increased concentrations for:

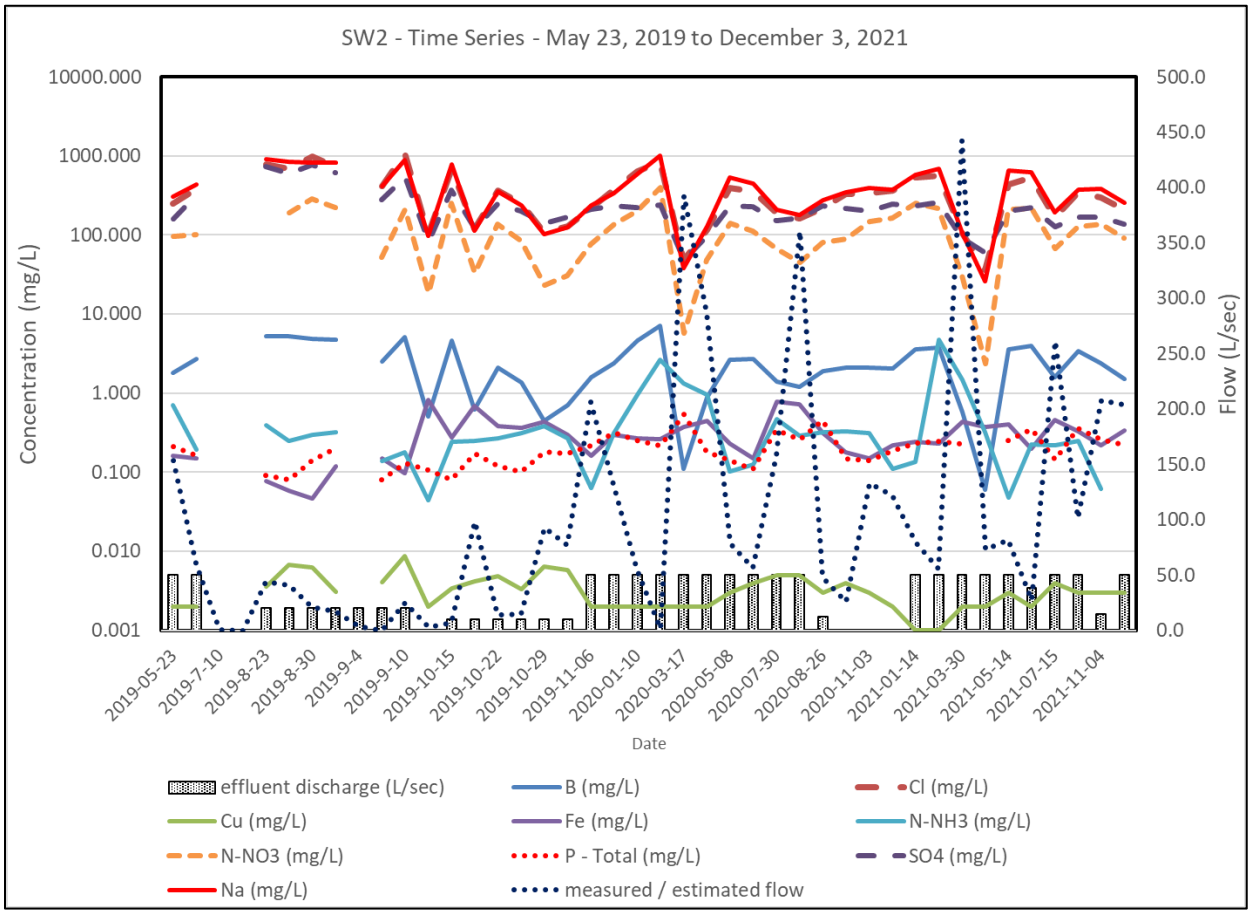
- B (median concentrations of 0.08 versus 2.1 mg/L at SWFD2 and SW2, respectively);
- Cl (median concentration of 29.5 versus 344 mg/L at SWFD2 and SW2, respectively);
- Cu (slight increase of median concentration of 0.002 to 0.003 mg/L at SWFD2 and SW2, respectively);
- Na (median concentration of 19 versus 372 mg/L at SWFD2 and SW2, respectively);
- NO_3-N (median concentrations increase from 2.35 to 105.5 mg/L for SWFD2 and SW2, respectively); and,
- SO_4 (median concentration increase from 63 to 219 mg/L for SWFD2 and SW2, respectively).
- The quality of Fraser Drain water was not changed significantly or marginally improved for:
- Fe (median concentrations decreased from 0.37 to 0.27 mg/L for SWFD2 and SW2, respectively);
- NH_3-N (median concentrations increased marginally from 0.182 to 0.279 mg/L for SWFD2 and SW2, respectively); and,
- TP (median concentrations decreased from 0.249 to 0.183 mg/L for SWFD2 and SW2, respectively).

Figure 13 Comparison of Median and 90th Percentile for Selected Water Quality Variables for Fraser Drain Stations SW2 (downstream of treated effluent discharge) and SWFD2 (upstream of treated effluent discharge) for Samples Collected since May 23, 2019 (Data labels are for the 90th percentile concentrations)



Water quality data for selected variables for each sample date in 2019 through 2021 are shown along with the measured treated effluent discharge rate and the measured stream flow for SW2 in Figure 14. Treated effluent discharge has been generally proportional to the flow in Moose Creek (SW1) during this period in order to provide a minimum 5:1 dilution of the effluent and discharge was not to occur if the 12-hour average discharge at SW1 exclusive of the effluent volume was less than 60 L/sec. In-stream concentrations peaked with high effluent discharge rates and low instream flows. Minimal concentrations occurred when effluent discharges coincided with high in-stream flow rates such as during spring freshet and significant rainfall events on April 7, 2020 (SW2 flows measured at 1408 L/sec), October 18 and October 29, 2019 (SW2 stream flows at 98 and 93 L/sec, respectively), March 30, 2021 (SW2 flows at 443 L/sec), July 15, 2021 (SW2 flows at 261 L/sec) and November 4, 2021 (SW2 flows at 208 L/sec).

Figure 14 Time Series of Selected Water Quality Variables, Treated Effluent Discharge Rate and Measured Streamflow (L/sec) for SW2 from May 23, 2019 to December 3, 2021



4.6.1.3. Phenols in Treated Effluent and Receiving Waters

Phenols have not been included in the above discussion due to the fact that phenols commonly are less than laboratory detection or the method reporting limit (MRL) of 0.001 mg/L in the case of surface water samples or 0.002 mg/L for the treated leachate samples. Some issues occurred in the LTF in late 2018 and early 2019 with respect to meeting treated effluent compliance limits for phenols until this was addressed fully in April 2019. For the remainder of 2019, phenol concentrations were reported as equal to or less than the MRL of either 0.001 or 0.002 mg/L depending on the laboratory analysing the samples. The latter MRL reported by Caduceon Environmental Laboratories unfortunately exceeds the PWQO. Phenols in the effluent throughout 2020 have been less than the MRL except on March 16 and 17, 2020 when it was less than the effluent limit at 0.005 mg/L. During 2021, phenols exceeded the effluent limit on one occasion during the discharge events of April 27-29 at 0.006 mg/L. Phenol concentrations at SW2

that exceeded the PWQO are compared to the corresponding upstream concentrations at SWFD2 and downstream at SW2 and in Moose Creek at SWMC1 in Table 14 for samples since May 23, 2019.

The median concentration for phenols at SW2 throughout 2021 exceeded the PWQO of 0.001 mg/Lon Feb. 5 (0.006 mg/L), March 30 (0.006 mg/L), July 15 (0.005 mg/L) and Dec. 3 (0.002 mg/L). In a number of cases the PWQO exceedances at SW2 coincide with exceedances at SWFD2, apparently exacerbated by additional loadings from the effluent. SW1 concentrations are generally comparable to or less than background phenol concentrations at SWMC1 suggesting little influence from the treated effluent at SW1.

Table 14 Phenol Concentrations Exceeding PWQO at SW2 Compared to Upstream Concentrations at SWFD2 for Samples Since May 23, 2019

Date	Phenol Concentrations at SW1 (mg/L)	Phenol Concentration at SW2 (mg/L)	Background Phenol Concentration at SWFD2 (mg/L)	Background Phenol Concentration at SWMC1
2019-09-23	NM	NM	0.006	NM
2019-10-10	0.003	0.002	NM	<0.002
2019-12-11	<0.001	0.005	<0.001	<0.001
2020-01-10	0.005	0.015	NM	<0.001
2020-02-14	0.004	0.012	NM	<0.001
2020-03-17	0.003	0.007	<0.001	0.002
2020-04-07	<0.001	0.002	<0.001	<0.001
2020-05-08	0.005	0.004	<0.001	<0.001
2020-07-30	0.002	0.006	0.005	0.003
2020-08-04	0.006	0.006	0.007	0.005
2020-08-26	0.003	0.008	0.005	0.004
2020-10-13	0.004	NM	0.006	0.004
2021-02-25	0.002	0.006	NM	<0.001
2021-03-30	0.004	0.006	0.003	0.003
2021-06-28	<0.001	0.002	<0.001	<0.001
2021-07-15	0.003	0.005	0.003	0.003
2021-12-03	0.001	0.002	0.001	0.001

NM = not measured or detection limit greater than PWQO of 0.001 mg/L

NA = not available

Phenol concentrations in surface water are all very low. Understanding natural phenols in the water courses and the source connection is limited by the fact that most detections are close to the MRL and the MRL frequently exceeds the PWQO. Upstream or background concentrations of phenols greater than the PWQO are also frequently observed in Fraser Drain. A clearer understanding of phenols in the surface water of Fraser Drain would require further investigation to understand this phenomenon.

4.6.2. Description of Historic and Existing Water Quality in Moose Creek Watershed

4.6.2.1. Background Water Quality

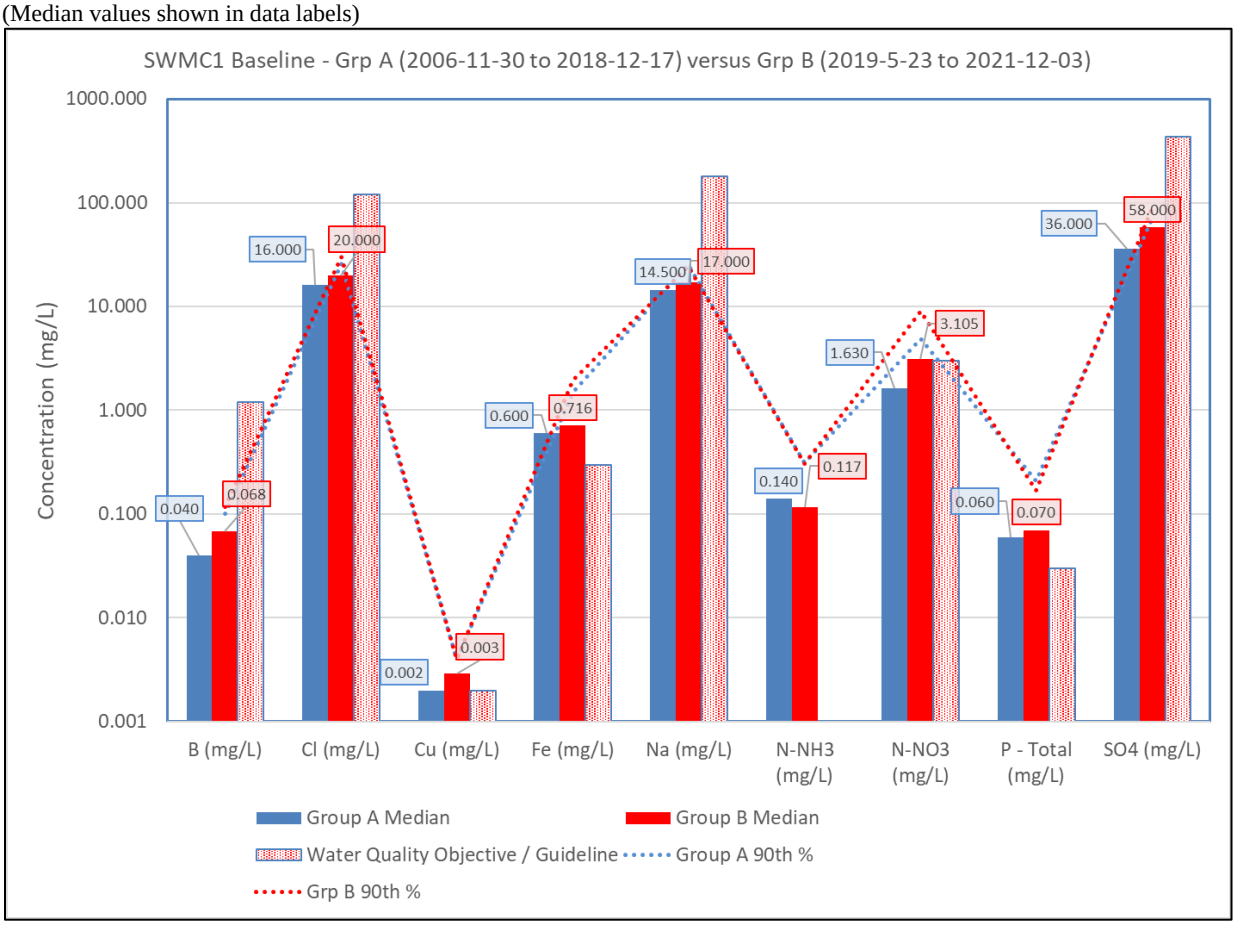
Three stations were selected for evaluation of existing or background conditions in Moose Creek including SWMC1 upstream of the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1,500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek and SWMC3 downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1. Selected water quality parameters for these three background stations (median and 90th percentile) are presented in Figure 15 for SWMC1 covering the period of record from Nov. 30, 2006 to Dec. 3, 2021. These data are presented in two time periods, Group A for data prior to May 23, 2019 and Group B for data since May 23, 2019. This grouping addresses the change in sampling intensity that commenced as of May 23, 2019. Data for other variables for the period May 23, 2019 to December 3, 2021 are included in Appendix D. All data prior to May 23, 2019 are included in the primary existing conditions report (CanDetec 2022).

Figures 16 presents comparable data for Moose Creek background stations SWMC2 and SWMC3[6] respectively. There is little change in quality between SWMC3 and SWMC2 (Group B) for the comparable data from May 23, 2019 to Dec. 3, 2021.

[6] *Sampling at SWMC3 commenced on May 23, 2019 and all data are considered within a single time period.*

Figure 15 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC1 Comparing Group A samples (2006-11-30 to 2018-12-17) to Group B samples (2019-05-23 to 2021-12-03).

(Median values shown in data labels)



Aggregated data generally show little change between the two sampling periods at SWMC1 whereas at SWMC2 (upstream) all variables are similar between the two time periods except for NO_3-N which increased in Group B while TP was significantly lower in Group B than in the earlier data set. The patterns noted for NO_3-N and TP are not present downstream at SWMC1.

Detailed time series plots for key variables are presented for the three Moose Creek background stations in Figure 17. The low concentration variables have been plotted on a log scale to provide clarity. Trend lines shown on the figures are for illustrative purposes only and have not been tested for significance. SO_4 has not changed with time at SWMC3 but shows a rising trend over the past 5 to 7 years at SWMC2 and SWMC1. Background concentrations of SO_4 are now of the order of 80 to 100 mg/L. Cl, Na, B, and NO_3-N all show a slight upward trend over the period of record confirming the observations in Figure 15. One notable feature of SWMC3 is the high concentrations of N-NH_3 at around 10 mg/L. This is an order of magnitude greater than concentrations downstream at SWMC2 and SWMC1. The storm event sampled on June 28, 2021 had a more notable effect upstream at SWMC3 than was evident further

downstream. The NO_3-N and NH_3-N both may be related to an effect from the town of Moose Creek or agricultural activies upstream of the sampling location.

Figure 16 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC2 Comparing Group A samples (2006-08-10 to 2018-12-17) to Group B samples (2019-05-23 to 2021-12-03) and SWMC3 (all data).

(Median values shown in data labels)

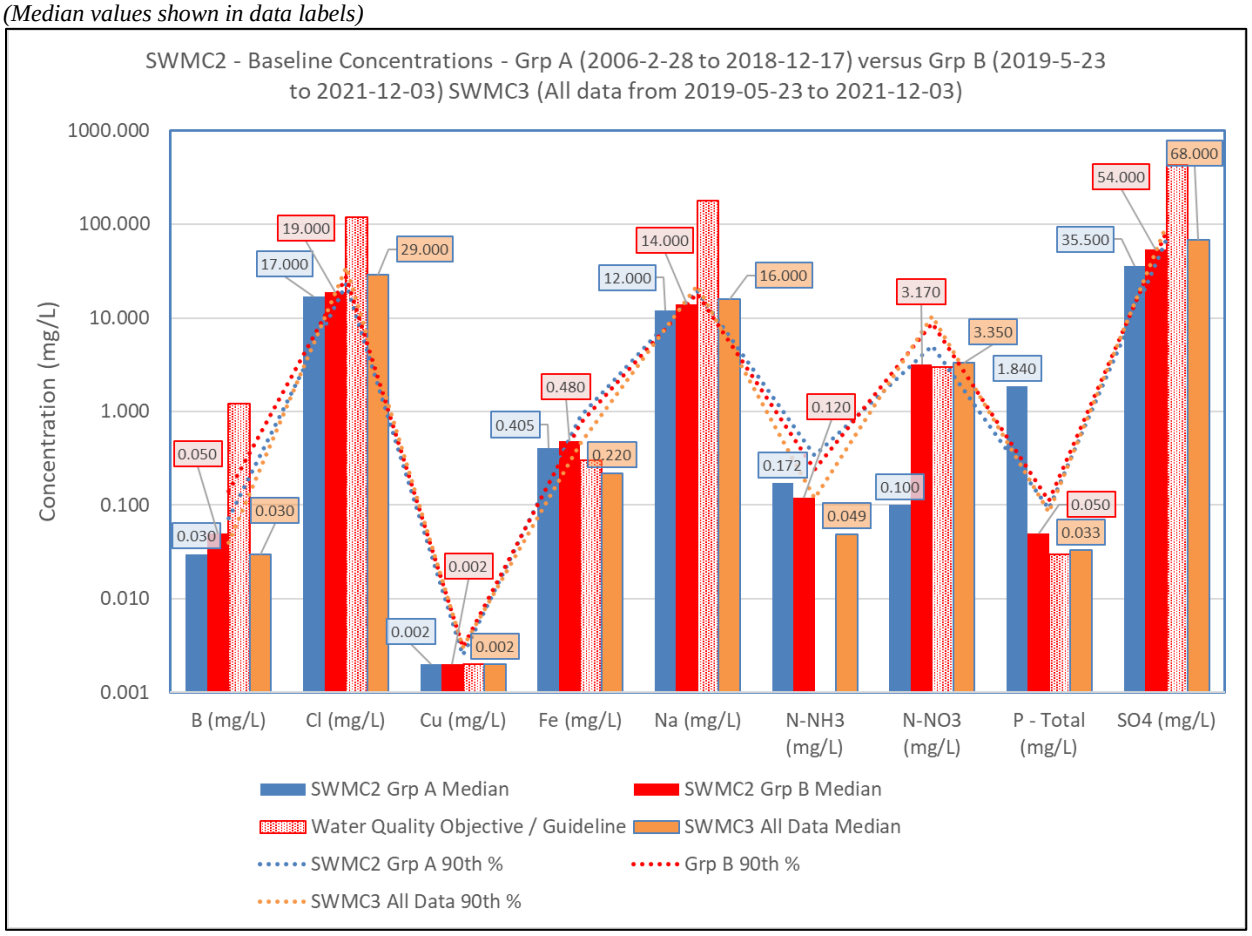
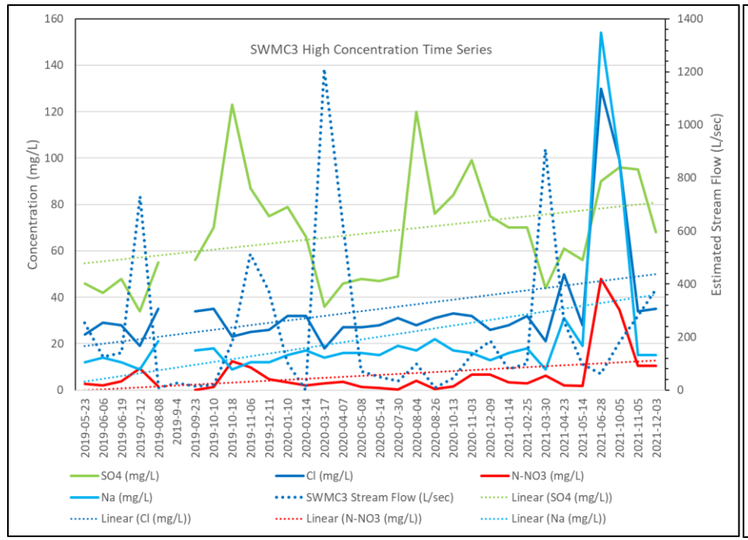
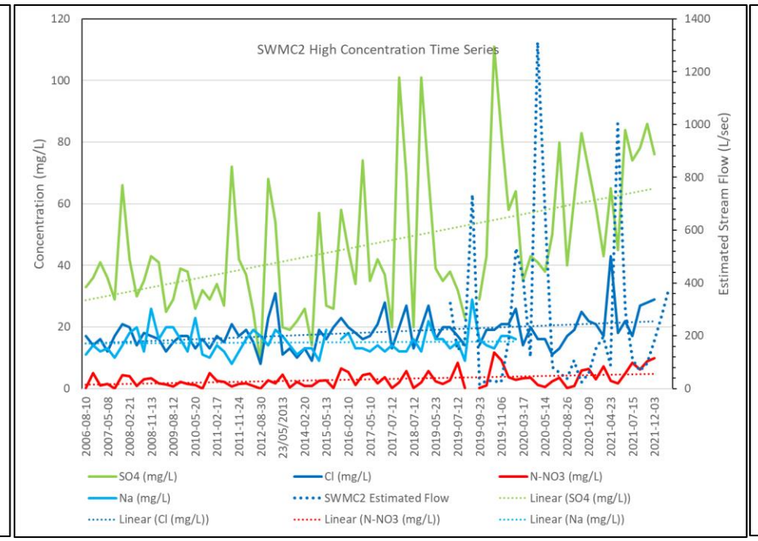
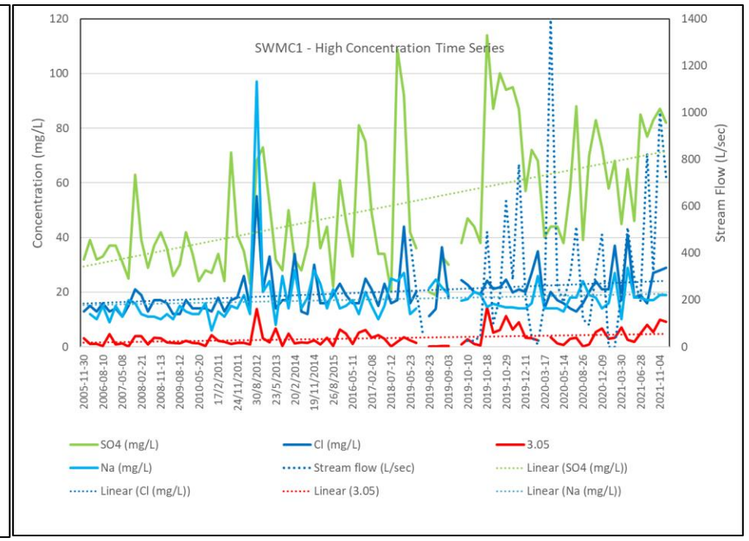
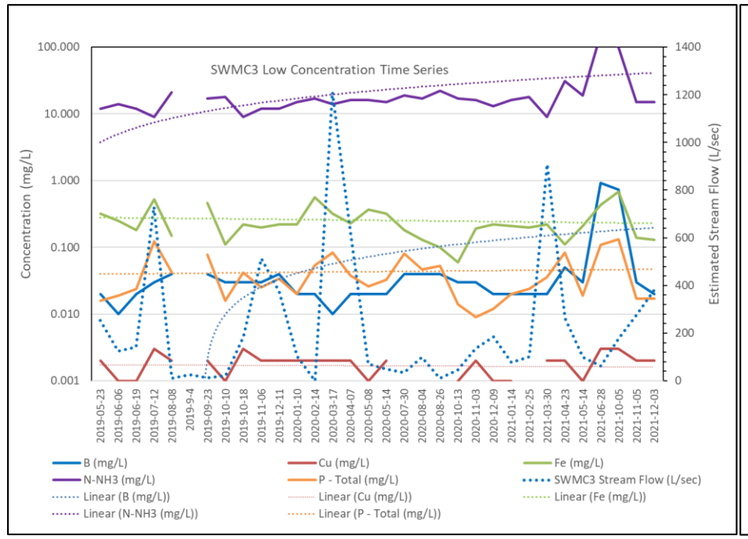


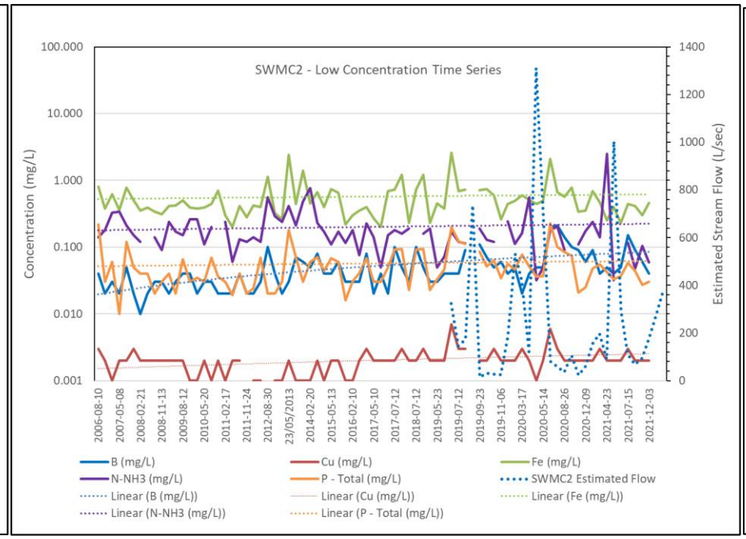
Figure 17 Time Series of Selected Water Quality Variables and Measured Streamflow (L/sec) for SWMC3 (2019-05-23 to 2020-12-09), SWMC2 (2006-08-10 to December 9, 2020) and SWMC1 (2006-11-30 to December 9, 2020) for High Concentration Time Series (Cl, Na, NO_3-N and SO_4) and Low Concentration Time Series (Boron, Cu, Fe, NH_3 -N and P-total)

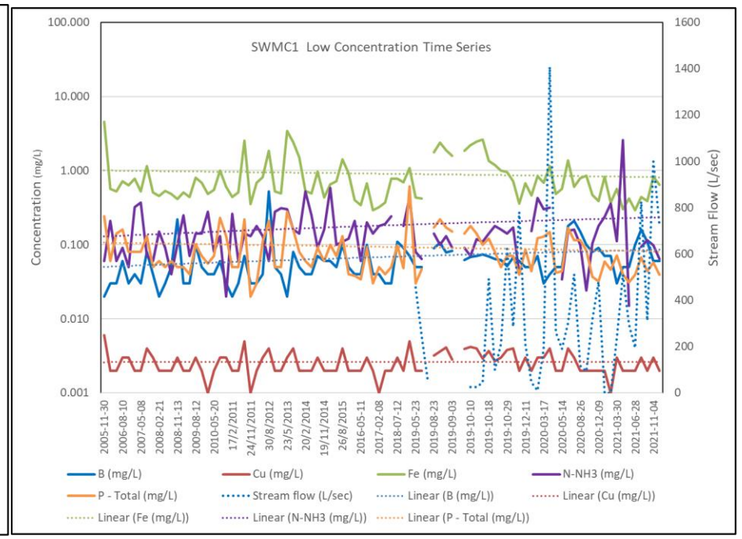












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4.6.2.2. SWAF1

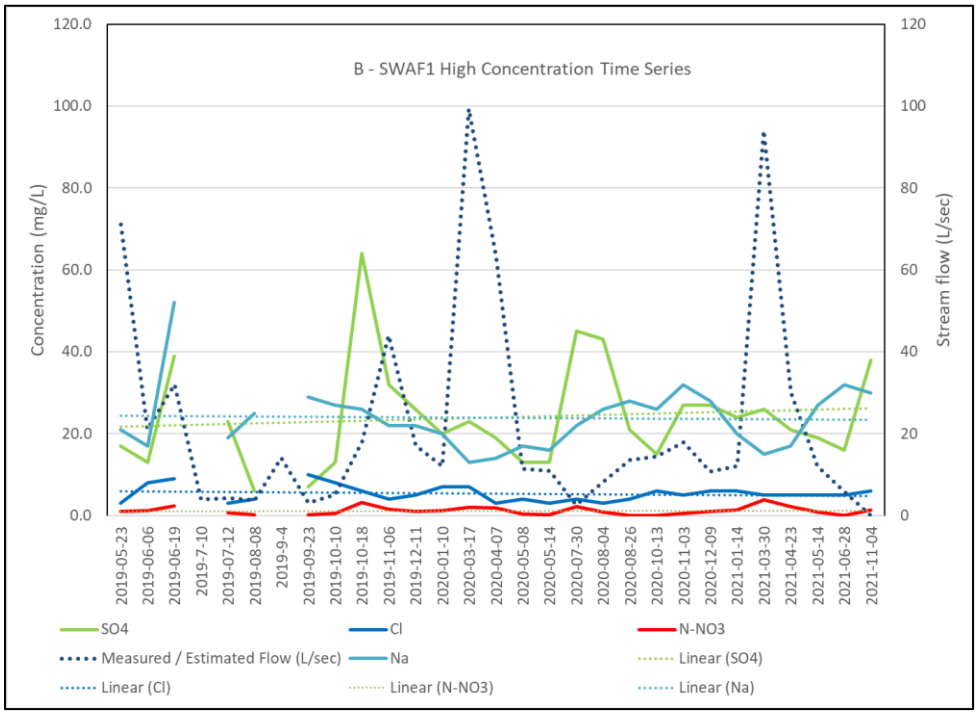
The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables are presented in Figure 18 and essentially show no trends for the last 32 months. SWAF1 median and 90th percentile water quality statistics are compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain, in Table 15.

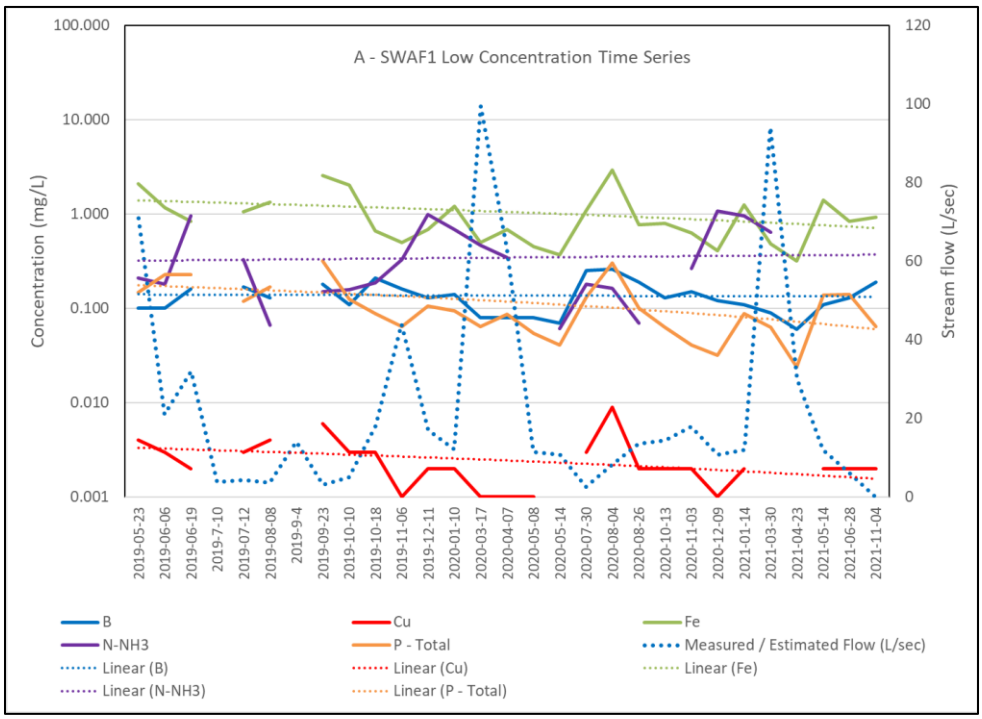
It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH_3-N and TP relative to samples from the last 32 months of monitoring at SWMC2. B is an order of magnitude higher while Fe and TP are double SWMC2 for the period May 23, 2019 to Dec. 3, 2021. Observations have indicated that the continuous flow at SWAF1 is largely associated with the peat and natural forested areas which are more representative of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO_3-N and SO_4 than the Albert-Fahey Award Drain. Median concentrations exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e., pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert Fahey Award Drain with higher concentrations of B, Fe, Na, NH_3-N and TP and lower concentrations of Cl, NO_3-N and SO_4 than is currently typical of Moose Creek.

Table 15 Comparison of Water Quality Statistics for Albert Fahey Award Drain (SWAF1) to Downstream Moose Creek (SWMC2)

Parameter	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWAF1 Median (90th Percentile / # samples) 2019-05-23 to 2021-12-03	SWMC2 Median (90th Percentile / # samples) 2006-02-28 to 2018-12-17	SWMC2 Median (90th Percentile / # samples) 2019-05-23 to 2021-12-03
B (mg/L)	0.2	29 / 1.5	ND / 1.2	0.130 (0.198) / 27	0.030 (0.073) / 48	0.050 (0.141) / 30
Cl (mg/L)		600 / 150	600 / 150	5.0 (8.0) / 27	17 (23) / 48	19 (27) / 30
Cu (mg/L)		ND / 0.004	0.029 / ≤0.002	0.002 (0.004) / 24	0.0020 (0.0025) / 46	0.002 (0.003) / 30
Fe (mg/L)	0.3	ND / 0.3	0.001 / ND	0.840 (2.06) / 27	0.41 (0.90) / 48	0.480 (0.744) / 30
Na (mg/L)	180			22 (31) / 27	12.0 (19.3) / 48	14.0 (18.1) / 30
NH_3 -N (mg/L)				0.28 (0.95) / 23	0.17 (0.34) / 45	0.12 (0.24) / 27
NO_3-N (mg/L)		124 / 3.0	32.8 / 3.0	1.11 (2.32) / 24	1.84 (5.01) / 46	3.17 (8.86) / 30
P-Total (mg/L)	0.03			0.094 (0.23) / 27	0.040 (0.092) / 48	0.050 (0.112) / 30
SO4 (mg/L)			429	21.0 (40.6) / 27	35.5 (69.0) / 48	54.0 (83.1) / 30

Figure 18 Time Series of Selected Water Quality Variables for SWAF1 from May 23, 2019 to December 3, 2021 for "A" Cl, Na, NO_3-N and SO_4 and "B" Boron, Cu, Fe, NH_3 -N and P-total





4.6.2.3. SW1 at the Concession 7 Bridge

SW1 is the station on Moose Creek downstream of the inflow from Fraser Drain which incorporates the treated effluent discharged to Fraser Drain. Water quality samples have been collected at this location since July 12, 1996. However, prior to May 23, 2019, these surface water samples have tended not to coincide with effluent discharge events and consequently measurements prior to this date do not reflect conditions in the creek during effluent discharge. This is illustrated in Figure 19 where summary data (median and 90th percentile) for key water quality variables are presented for four time periods:

i. Group A (1996-07-12 to 2007-08-01 and prior to effluent discharge);

ii. Group B (2007-08-01 to 2015-12-31 with limited effluent discharge);

iii. Group C (2016-01-01 to 2019-05-22 with upgraded leachate treatment facility but sampling did not coincide with discharge); and,

iv. Group D (2019-5-23 to 2021-12-03 with upgraded treatment and with all surface water samples collected during discharge events).

Information in Figure 19 show that generally there is little difference for most variables among the first 3 groups of data except for NO_3-N and NH_3-N which show higher concentrations in Group C. Not surprisingly, median concentrations rise in Group D for B, Cl, Na, NO_3-N and SO_4 over all preceding data. These trends are directly associated with the quality of the effluent discharged to the surface waters and the fact that samples at SW1 coincide with effluent discharge during this time period. Group D concentrations, relative to historic data, are essentially unchanged or even decrease slightly for Cu, Fe, NH_3 -N and TP. Median concentrations for Group D samples do not exceed the PWQO or CCME/EBC long term water quality guidelines for B, Cl, Na and SO_4; however, the 90th percentiles for these variables exceed the PWQO/long term guidelines for all water quality variables. As noted, Group D median concentrations are comparable to historic water quality in Moose Creek for Cu, Fe, N-NH_3 and TP indicating that exceedances of PWQO/long term guidelines are a result of background conditions in Moose Creek and are not associated with the landfill treated effluent discharges. Detailed data and summary data are provided in Appendix D.

4.6.2.4. Effect of Effluent Discharge on Moose Creek

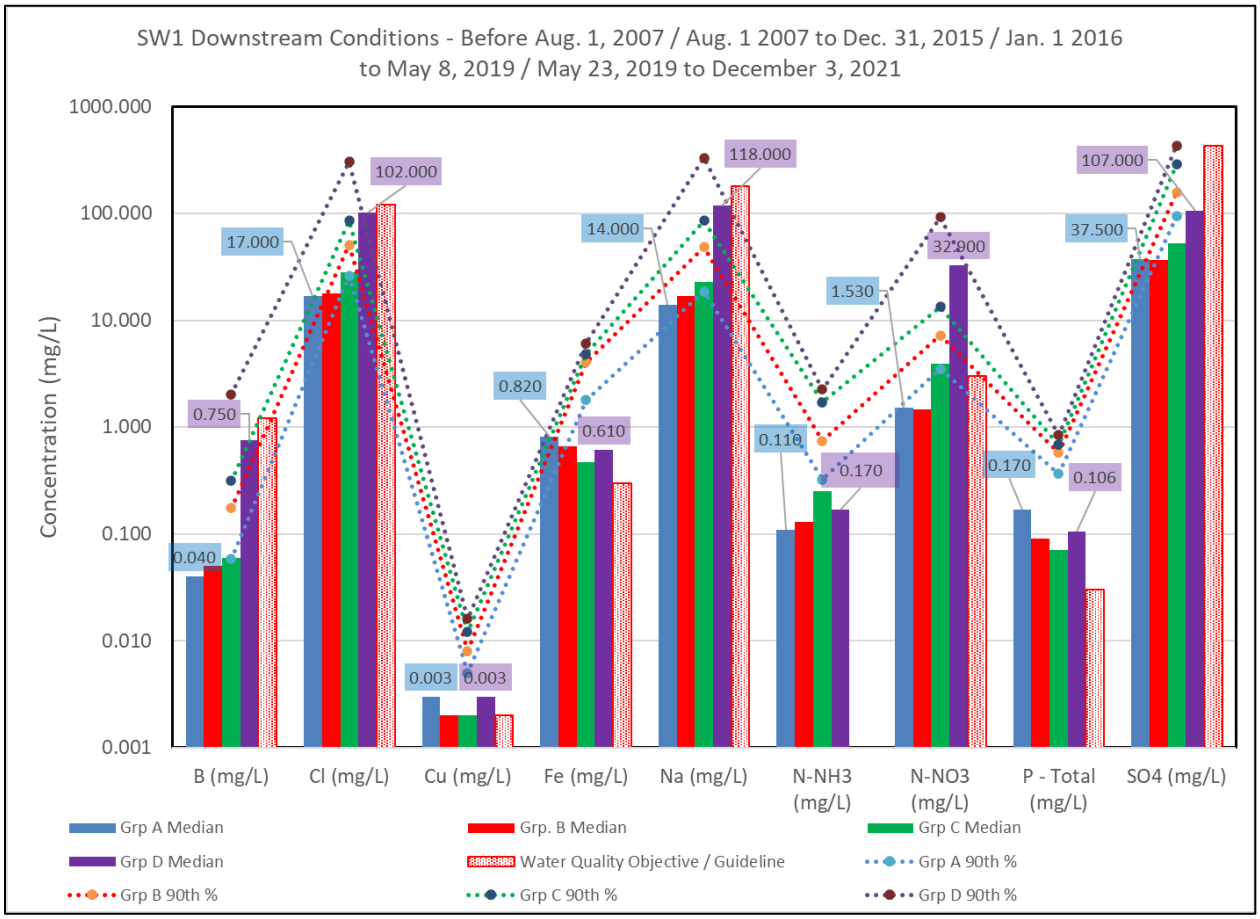
As noted above, only surface water data since May 23, 2019 has been sampled in association with treated effluent discharge events. Median concentrations and 90th percentiles for this time period (Group D) for upstream background stations SWMC2 and SWMC1 are compared to SW1 and SWMC5 in Figure 20. SWMC5 is a new station further downstream of SW1 that is outside of the planned study area. Sampling commenced at this location only as of May 8, 2020 with only 18 samples to date which have been incorporated here as confirmation of the SW1 data. Note that as with other figures, the vertical scale is logarithmic.

Prior to May 23, 2019, water quality sampling at SW1 infrequently coincided with effluent discharge. Since this date, quality samples have been taken when the effluent discharge rate has been managed at

between 10 and 50 L/sec such that it is more or less proportional to the flow in Moose Creek[7] as prescribed by draft

Figure 19 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SW1

(Comparing Group A (1996-7-12 to 2007-8-1); Group B (2007-8-1 to 2015-12-31); Group C (2016-1-1 to 2019-5-22); and Group D 2019-5-23 to 2021-12-03). Median values for Group A and Group D periods are indicated along with PWQOs or CCME/BC Environment Long Term Guidelines as appropriate.)



Provincial Officers Order or directions from MECP. During 2019, discharge was prescribed at either 20 or 10 L/sec during the low flow season. Since May 22, 2020, continuous logging of Moose Creek water levels and a satisfactory rating curve for SW1 has permitted variable effluent discharge rates proportional

[7] *The discharge rates relative to instream flows during 2019 were managed as directed under the draft Provincial Officers Orders number 7622-BF3PGH (16/08/2019) which permitted discharge at a rate not to exceed 20 L/sec and a memo from L. Forrester dated 04/10/2019 and as confirmed in draft POO number 0157-BGRN6Sthat effluent could be discharged to Fraser Drain at a rate not to exceed 10 L/sec. Effluent discharge during 2020 has been dictated by a memo from L. Forrester dated 27/03/2020 which required a minimum dilution ratio of 5:1 (stream flow to effluent)with no discharge of treated effluent where streamflow in Moose Creek (without the influence of effluent) is less than 60 L/sec based on a 12 hour running average water level.*

to flow in the receiving waters such that a 5:1 assimilation ratio, based on a 12-hour average flow, was generally maintained. Effluent discharge was not permitted when receiving water flow was less than 60 L/sec based on a 12-hour running average water level exclusive of effluent discharge.

Changes in surface water quality medians for the data from May 23, 2019 to Dec. 3, 2021 at SW1 relative to upstream Moose Creek quality (SWMC2)[8] as illustrated in Figure 18 can be summarized as follows:

- Boron – median increases from 0.050 to 0.750 mg/L;
- Chloride – median increases from 19 to 102 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.480 to 0.610 mg/L;
- Sodium – median increases from 14 to 118 mg/L;
- Ammonia – median increases slightly from 0.120 to 0.170 mg/L;
- Nitrate – median increases from 3.2 to 32.9 mg/L;
- Phosphorus Total – median increases from 0.050 to 0.106 mg/L; and,
- Sulphate – median increases from 64 to 107 mg/L.

The change in Cu is likely too small to be anything more than natural variability. The apparent increase in Fe is not due to the release of the effluent which has a median concentration in the measured effluent in 2021 of 0.063 mg/L on 18 samples which is below the effluent limit for the LTF (1.0 mg/L) and an order of magnitude less than the median background concentration at SWMC2. Similarly, the effluent is not a significant contributor to the increase in TP at SW1 as the treated effluent has a median concentration for 2019 through 2021 of 0.080 mg/L (n = 65) an order of magnitude less than the effluent limit and slightly greater than the median background concentration of 0.050 mg/L. By comparison, TP concentrations at SWFD2, upstream of the effluent discharge location, have a median TP concentration of 0.268 mg/L suggesting that any increase in concentration of TP at SW1 is primarily a result of non-point sources to both Moose Creek and Fraser Drain including contributions from the Albert-Fahey Award Drain.

Median concentrations of Cl, Na and NO_3-N increase slightly between SW1 and SWMC5 (Figure 18) indicating some additional inputs for these parameters downstream of SW1. Na and Cl increases may be the result of road salting on Highway 417, while NO_3-N is likely related to non-point sources. B, Cu, Fe, NH_3-N, TP and SO_4 decrease or show no change. The analytes that increase downstream are fewer than originally identified based on only the 2020 data from SWMC5.

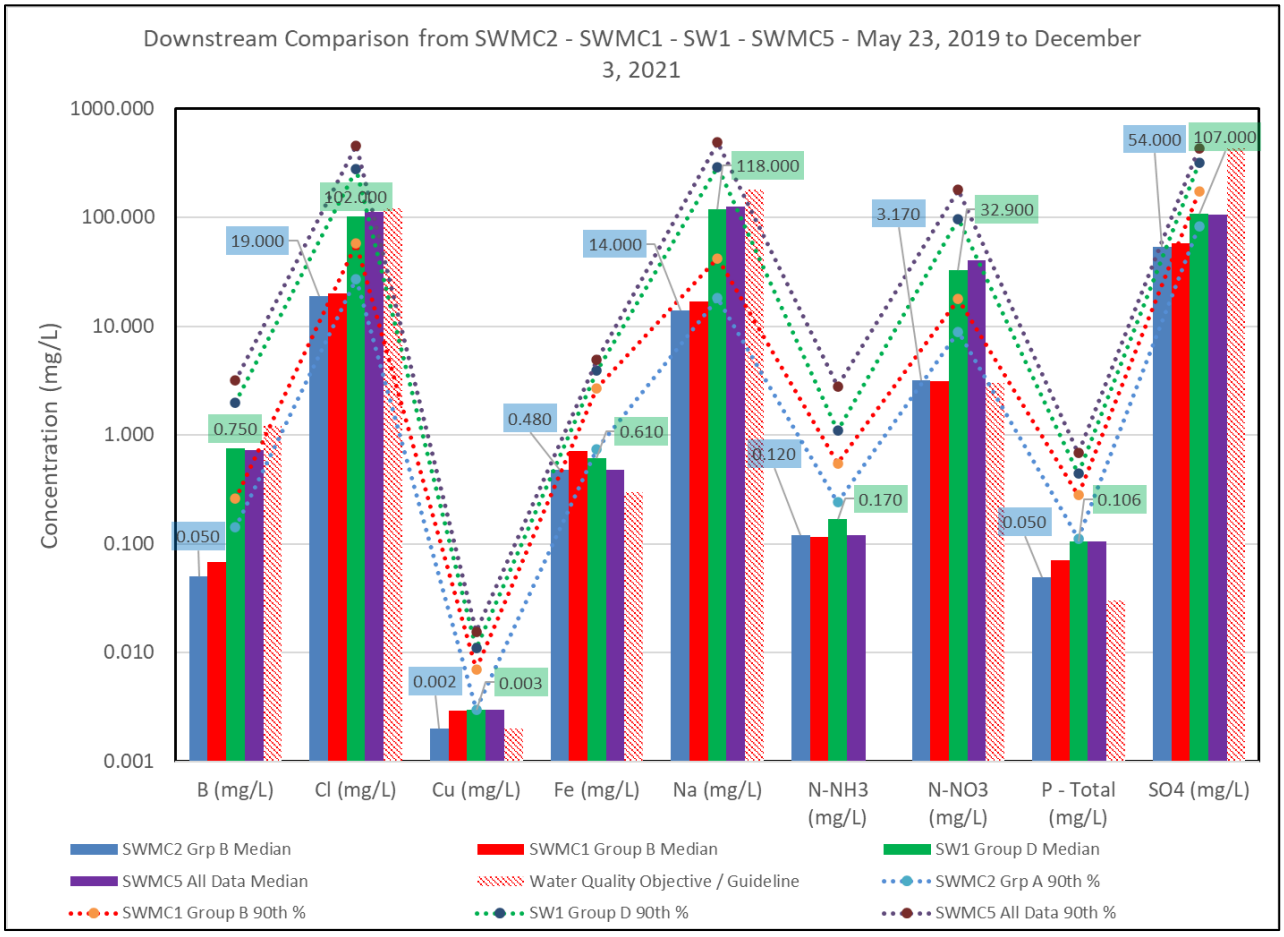
Considering only the data collected since May 23, 2019 in Figure 20, it is evident that the median concentrations of the effluent mixed with flow in Fraser Drain result in a significant increase in the median concentration at SW1 relative to upstream Moose Creek (SWMC1 or SWMC2) for B, Cl, Cu, Na,

[8] *SWMC2 has been used as the reference site here as there is some evidence that the original location of SWMC1 may be impacted by backwater from the confluence of Fraser Drain with Moose Creek. Although this does not seem likely, SWMC1 was moved further upstream beginning in 2020 (CanDetec, Nov. 29, 2019).*

NO_3-N and SO_4. The effluent generally does not result in exceedances of the PWQO or water quality guideline at SW1 based on the median concentrations except for NO_3-N. However individual worst case samples illustrated by the 90th percentiles exceed the objectives or guidelines for all analytes at SW1 and SWMC5. Moose Creek background concentrations for SWMC1 and SWMC2 exceed their respective PWQOs / Guidelines for Cu, Fe, N-NH_3, N-NO_3, TP and SO_4 indicating poor water quality for Moose Creek upstream of the confluence with Fraser Drain.

Figure 20 Summary Data (Median and 90th Percentile) for Selected Water Quality Variables for SWMC2, SWMC1, SW1 and SWMC5 from 2019-5-23 to 2021-12-03.

(Median values for SWMC2 and SW1 are indicated along with PWQOs or CCME/BC Environment Long Term Guidelines as appropriate)



A comparison of summary water quality data for samples collected since May 23, 2019 for SWFD3 on Fraser Drain upstream of the effluent discharge location, SW2 on Fraser Drain downstream of the discharge location, SWMC2 on Moose Creek upstream of the confluence with Fraser drain and SW1 downstream of the confluence with Fraser Drain is provided in Table 16. In this table, mean and standard deviation have been shown in addition to the count of samples for each variable that exceed the objective or guideline relative to the total number of samples for each station that exceeds the MRL.

Table 16 PWQO and/or Water Quality Guideline Exceedances for Moose Creek Stations (SW1 and SWMC2) Compared to SW2 Station on Fraser Drain

(Mean ± Standard Deviation [count >Objective or Guideline / count of samples above detection limit] for samples between 2019-05-23 and 2021-12-03)

Water Quality Parameter (mg/L)	PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWFD3 on Fraser Drain Upstream of SW2 (2019-05-23 to 2021-12-03)	SW2 on Fraser Drain Upstream of Moose Creek (2019-05-23 to 2021-12-03)	SWMC2 on Moose Creek Upstream of Fraser Drain (2019-05-23 to 2021-12-03)	SW1 on Moose Creek Downstream of Fraser Drain (2019-05-23 to 2021-12-03)
Boron (B)	0.2	29 / 1.5	ND / 1.2	0.042±0.034 [0 / 44]	2.56±1.71 [30 / 39]	0.072±0.048 [0 / 30]	0.850±0.719 [8 / 39]
Chloride (Cl)		600 / 150	600 / 150	45±74 [2 / 44]	382±262 [31 / 39]	20.1±6.23 [0 / 30]	128±101 [17 / 39]
Copper (Cu)		ND / 0.004	0.029 / ≤0.002	0.002±0.001[12 / 44]	0.003±0.002 [24 / 39]	0.003±0.001 [7 / 30]	0.003±0.001 [22 / 39]
Iron (Fe)	0.3	ND / 0.3	0.001 / ND	0.356±0.299[15 / 44]	0.305±0.191 [16 / 39]	0.618±0.494 [20 / 30]	0.704±0.422 [36 / 39]
Sodium (Na)	180			23±24 [0 / 44]	417±275 [30 / 39]	14.7±3.9 [0 / 30]	135±109 [9 / 39]
Ammonia (NH_3 - N)				0.104±0.201 [NA / 33]	0.527±0.859 [NA/ 38]	0.227±0.470 [NA / 23]	0.269±0.377 [NA / 39]
Un-ionized Ammonia	0.02			0.003±0.005 [0 / 23]	0.006±0.009 [2 / 30]	0.005±0.009 [12 / 23]	0.004±0.009 [2 / 31]
Nitrate (NO_3-N)		124 / 3.0	32.8 / 3.0	3.11±2.59 [18 / 40]	126.2±59.6 [37 / 38]	4.148±3.288 [9 / 30]	40.4±30.1 [36 / 39]
Total Phosphorus (TP)	0.03			0.092±0.079 [32 / 43]	0.205±0.103 [38 / 38]	0.065±0.048 [19 / 30]	0.115±0.050 [38 / 38]
Sulphate (SO_4)			429	52±15 [0 / 43]	250±174 [5 / 39]	57±22 [0 / 30]	114±64 [0 / 39]

Based on the data for the period from May 23, 2019 to December 3, 2021, changes in surface water quality (means) at SW2 relative to upstream Fraser Drain quality at SWFD3 from Table 16 can be summarized as follows:

- Boron – mean increases by two orders of magnitude from 0.042±0.034 to 2.56±1.71 mg/L (background is less than BCMOE guideline of 1.2 mg/L but SW1 is greater but with a high standard deviation due to highly variable B concentrations in effluent);
- Chloride – mean increases from 45±74 to 382±262 mg/L (mean at SW2 double CCME guideline of 120 mg/L);
- Copper – mean shows little change from 0.002±0.001 to 0.003±0.002 mg/L (less than PWQO of 0.005 mg/L but both greater than BCMOE guideline of <0.002 mg/L);
- Iron – mean reduces due to low concentrations in effluent from 0.356±0.299 to 0.305±0.191 mg/L (both at the PWQO of 0.3 mg/L);
- Sodium – mean increases from 23±24 to 417±275 mg/L (background well below MECP Aquatic Protection Value (APV) of 180 mg/L but SW2 double the APV and highly variable);
- Ammonia – mean increases from 0.104±0.201 to 0.527±0.859 mg/L;
- Un-ionized Ammonia - mean increases very slightly from 0.003±0.005 to 0.006±0.009 mg/L (both an order of magnitude less than the PWQO of 0.02 mg/L);
- Nitrate – mean increases from 3.11±2.59 to 126.2±59.6 mg/L (background meets the CCME guideline while SW2 is an order of magnitude above the CCME guideline of 3.0 mg/L);
- Phosphorus Total – mean increases from 0.092±0.079 to 0.205±0.103 mg/L (both in excess of the PWQO of 0.03 mg/L); and,
- Sulphate – mean increases from 52±15 to 250±174 mg/L (both are well below the BCMOE guideline of 429 mg/L).

Changes in surface water quality (means) at SW1 relative to upstream Moose Creek quality at SWMC2[9] from Table 17 can be summarized as follows:

- Boron – mean increases by an order of magnitude from 0.072±0.048 to 0.850±0.719 mg/L (both less than BCMOE objective of 1.2 mg/L);
- Chloride – mean increases from 20.1±6.23 to 128±101 mg/L (mean at SW1 slightly above CCME guideline of 120 mg/L);

[9] *SWMC2 has been used as the reference site here as there is some evidence that the original location of SWMC1 may be impacted by backwater from the confluence of Fraser Drain with Moose Creek. Although this does not seem likely, SWMC1 was moved further upstream beginning in 2020 (CanDetec, Nov. 29, 2019).*

- Copper – mean shows no change from 0.003±0.001 to 0.003±0.001 mg/L (less than PWQO of 0.005 mg/L but greater than BCMOE guideline of <0.002 mg/L);
- Iron – mean increases slightly from 0.618±0.494 to 0.704±0.422 mg/L (both double the PWQO of 0.3 mg/L);
- Sodium – mean increases by an order of magnitude from 14.7±3.9 to 135±109 mg/L (both below MECP Aquatic Protection Value (APV) of 180 mg/L);
- Ammonia – mean increases slightly from 0.227±0.470 to 0.269±0.377 mg/L;
- Un-ionized Ammonia - mean decreases slightly from 0.005±0.009 to 0.004±0.009 mg/L (both an order of magnitude less than the PWQO of 0.02 mg/L);
- Nitrate – mean increases from 4.15±3.29 to 40.4±30.1 mg/L (background exceeds the CCME guideline while SW1 is an order of magnitude above the CCME guideline of 3.0 mg/L);
- Phosphorus Total – mean increases from 0.065±0.048 to 0.115±0.050 mg/L (both in excess of the PWQO of 0.03 mg/L); and,
- Sulphate – mean increases from 57±22 to 114±64 mg/L (both are well below the BCMOE guideline of 429 mg/L).

These summary data provide a good indication of the effect of the treated effluent discharge on the receiving waters of both Fraser Drain and Moose Creek.

Time series plots for key water quality variables for SW1 compared to SWMC2 (upstream) for 2019-05-23 to 2021-12-03 are presented in Figure 21. What is evident in Figure 21 is that the treated effluent discharges during October 2019 through Dec. 2021 result in more consistent water quality concentrations at SW1. Effluent discharges in October 2019 were limited to 10 L/sec, and throughout 2020 and 2021, effluent discharge rates were proportional to instream flows at SW1 up to a maximum effluent discharge rate of 50 L/sec. The variability is generally a result of greater dilution of the effluent due to high in-stream flows such as during the fall of 2019, on March 17, 2020, April 7, 2020, April 4 and May 14, 2021 and November 11 and December 3, 2021. Overall, the correspondence of effluent discharge proportional with in-stream flows has resulted in a general declining trend or improvement of water quality at SW1 over the 32 months for Cl, Na and SO_4. Cl concentrations at SW1 exceeded the CCME guideline a total 17 times in 39 samples. SW1 concentrations of Na exceeded the Aquatic Protection Value only 9 of 39 samples at SW1 while sulphate never exceeded the BCMOE surface water guideline.

NO_3-N exceeds the CCME guideline at the Moose Creek background station in 9 of 39 samples and is an order of magnitude greater than the guideline at SW1 and exceeding the guideline in 36 of 39 samples. Even the high in-stream flows such as on March 17, 2020 and April 7, 2020 (dilution ratio of 28:1) do not sufficiently mitigate the NO_3-N concentrations in the effluent indicating that dilution alone does not provide compliance with current water quality guidelines for NO_3-N.

The time series for B, Cu, Fe, NH_3-N and TP are also illustrated in Figure 21. B is similar to Cl, as discussed above, in that concentrations exceed the BCMOE guideline during discharge events of 50 L/sec

and 30 of 39 samples exceeded the guideline at SW2. Only 8 of 39 samples exceed the B guideline at SW1 and there are no exceedances upstream in Fraser Drain or Moose Creek.

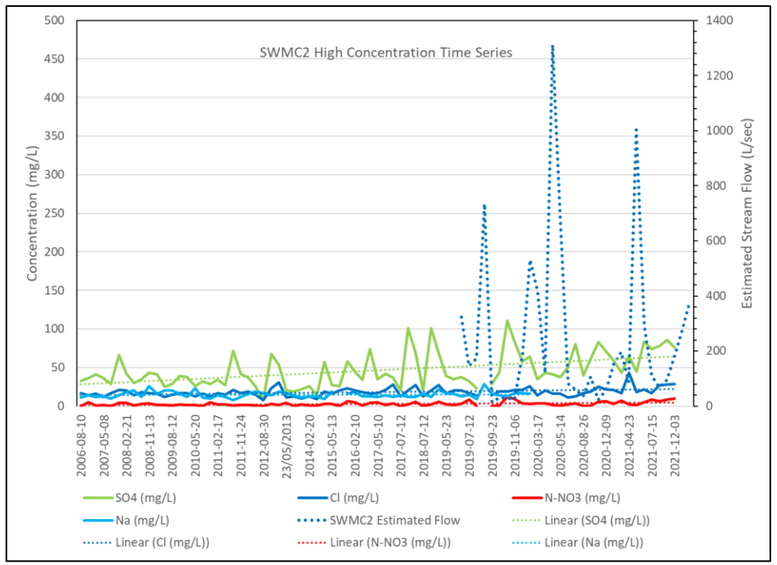
NH_3-N is highly variable with lowest concentrations associated with high flows in Moose Creek. Ammonia levels are gradually rising in Moose Creek both upstream and at SW1. With respect to un-ionized ammonia, exceedances occurred at SW1 on only 2 of 31 sampling events while upstream Moose Creek (SWMC2) concentrations exceeded the PWQO of 0.02 mg/L a total of 12 out of 23 samples including both of the sample dates that the objective was exceeded at SW1. The low ammonia concentrations at SW1 indicate that ammonia toxicity due to effluent discharge is being managed currently and that upstream Moose Creek water quality has greater risk from un-ionized ammonia due to background concentrations.

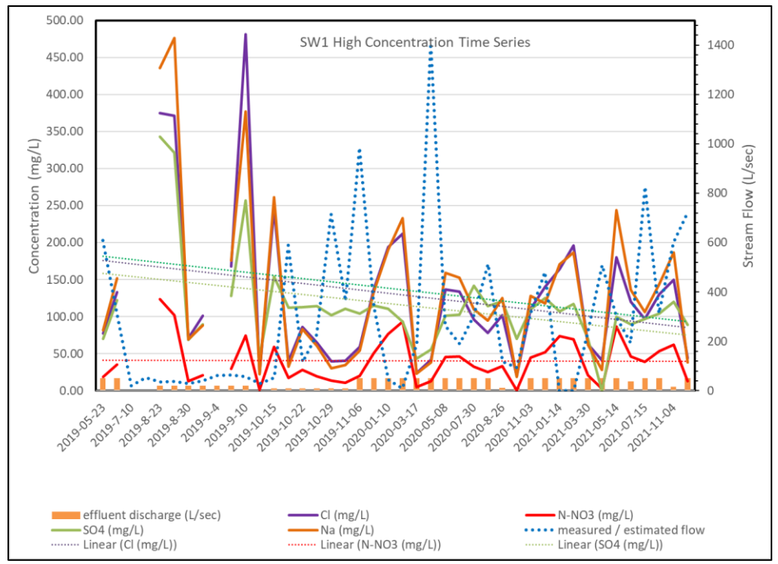
TP exceeds the PWQO on all sampling events. In general, the high TP concentrations at SW1 are controlled by high background concentrations in the receiving waters with little influence based on flow proportional discharge ratios.

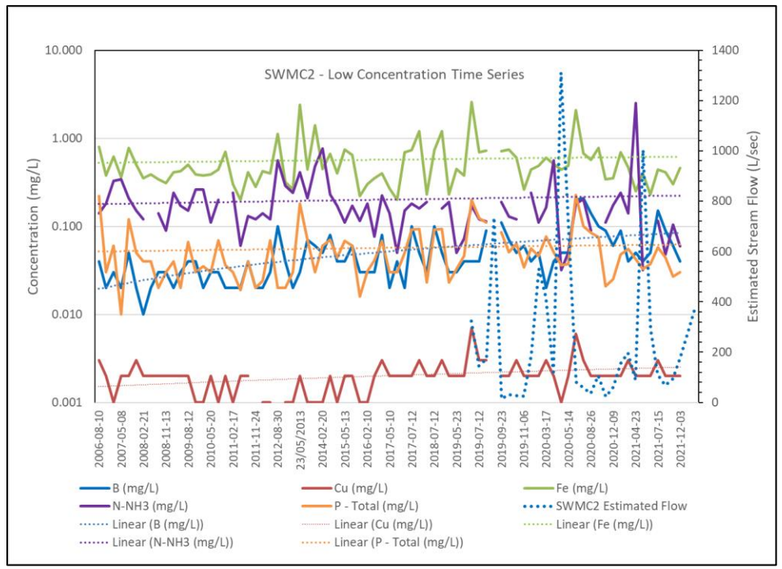
Fe concentrations are consistently in excess of the PWQO due largely to the high background concentrations in the receiving waters. Although concentrations at SW1 have been relatively consistent during the 32 months of monitoring, the reduction of Fe in the effluent or further changes to the ratio of receiving water to effluent will have little to no impact on Fe concentrations in the receiving water.

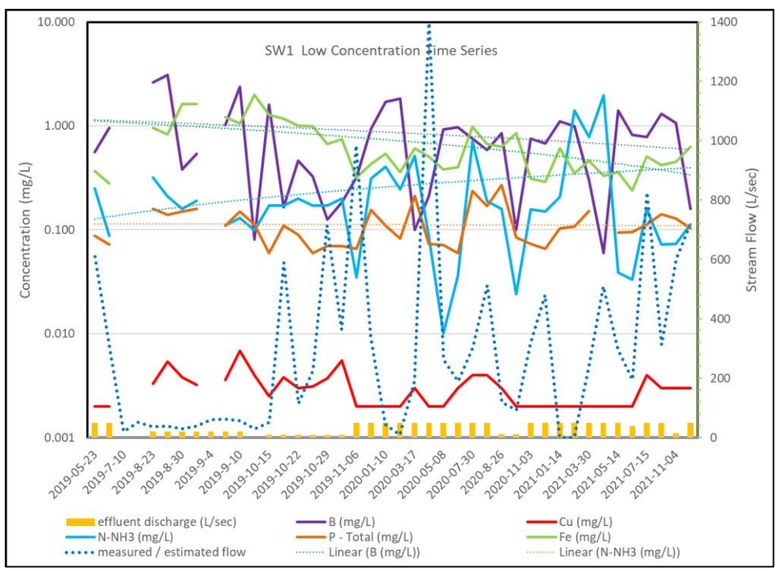
Cu concentrations are not highly affected by the effluent and are generally controlled by the background concentrations in the receiving waters and remain below the PWQO.

Figure 21 Time Series of Selected Water Quality Variables for SW1 Compared to Upstream Moose Creek at SWMC2 from 2019-05-23 to 2021-12-03 for "High Concentrations" (Cl, Na, NO_3-N and SO_4) and "Low Concentrations" (Boron, Cu, Fe, NO_3-N and P-total)









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4.6.3. Upper-Tayside Drain Station (SWLTD1)

The Upper-Tayside drain is on the western edge of the proposed landfill expansion. As illustrated in Figure 2, it has a catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17, 2020 through to December 3, 2021. Based on the mean concentrations, SWLTD1 concentrations for 2020-2021 of Na, NO3-N and TP were double those of SWFD3 for the period from May 23, 2019 to December 2021; Cl, N-NH_3, Fe and SO_4 were slightly elevated at SWLTD1 and B, NH_3-N and Cu were comparable (Table 17). Other variables were similar or lower than SWFD3 concentrations. These values represent summary existing conditions quality of Fraser Drain at SWFD3 and of the Upper-Tayside Drain.

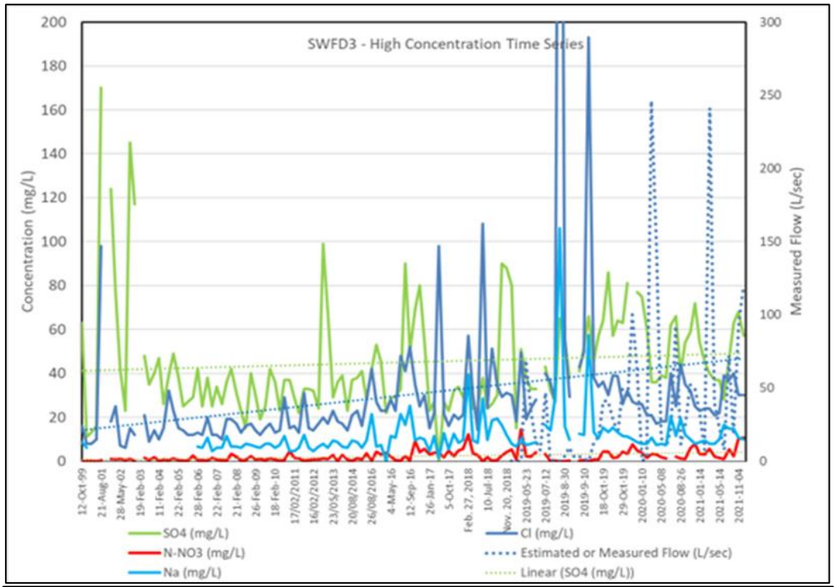
Time series concentrations for SWFD3 and SWLTD1 for the available data are compared in Figure 22. A qualitative comparison of the two water courses indicates that concentration were similar at both locations for NO_3-N, B, Cu, Fe and NH_3 -N, lower in SWLTD1 for SO_4 and Cl but noticeably higher in SWLTD1 for Na and TP.

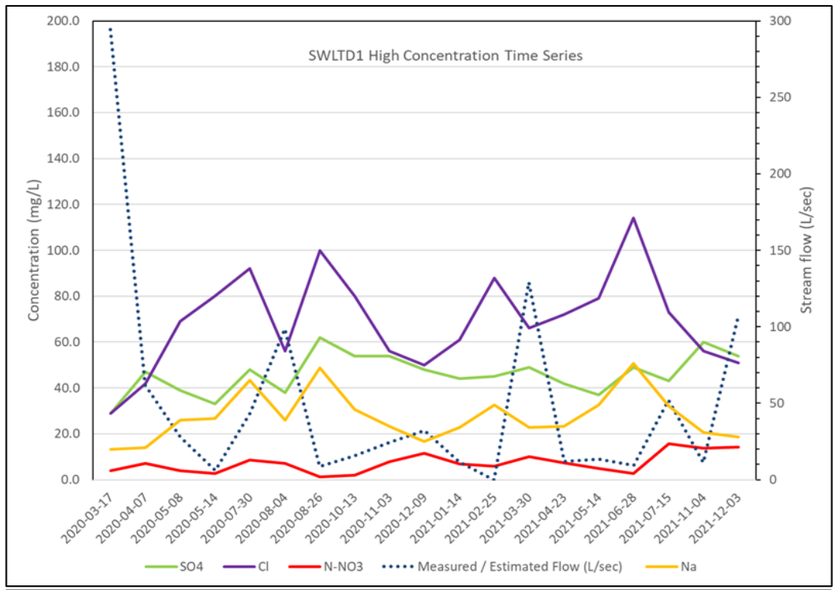
Table 17 Summary Water Quality Data for Upper-Tayside Drain Station SWLTD1 Compared to Fraser Drain SWFD3

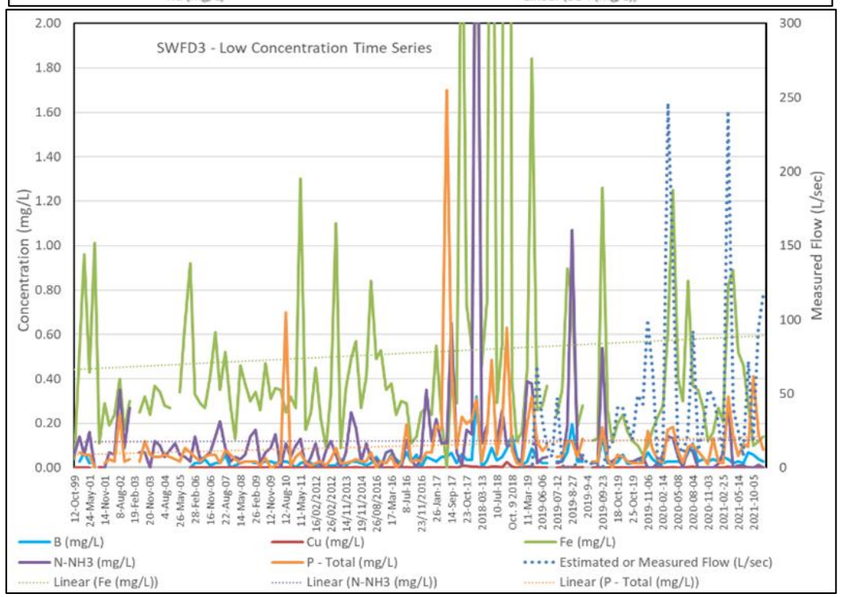
(Mean ± Standard Deviation [count >Objective or Guideline / count of samples above detection limit])

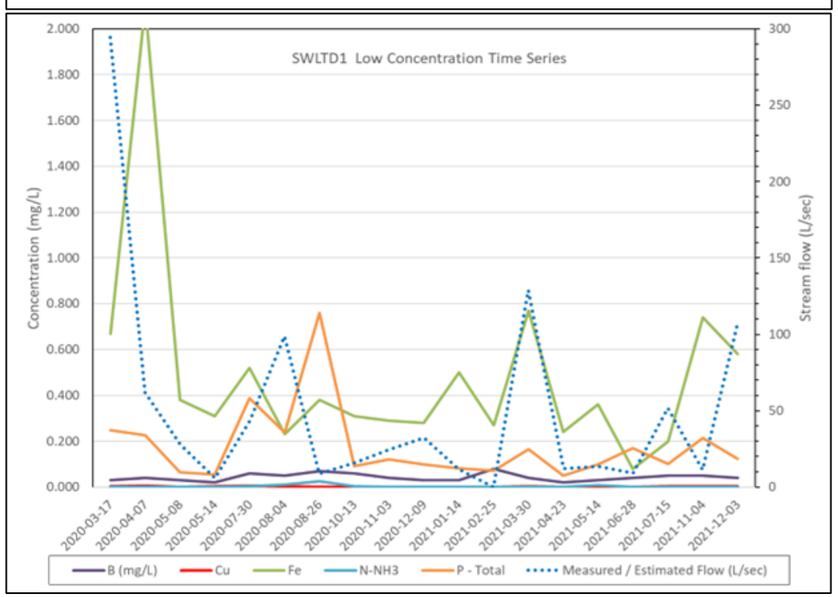
Water Quality Parameter (mg/L)	PWQO (APV for Cl and NA)	CCME Surface Water Quality Guideline - short / long term	Environment BC Surface Water Quality Guideline – short / long term	SWLTD1 at Highway 138 (2020-03-17 to 2021-12-03)	SWFD3 (May 23, 2019 to December 3, 2021
Boron (B)	0.2	29 / 1.5	ND / 1.2	0.043±0.016 [0 / 19]	0.042±0.034 [0 / 44]
Chloride (Cl)		600 / 150	600 / 150	69±21 [0 / 19]	45±74 [2 / 44]
Copper (Cu)		ND / 0.004	0.029 / ≤0.002	0.003±0.0012 [5 / 19]	0.002±0.0010 [12 / 44]
Iron (Fe)	0.3	ND / 0.3	0.001 / ND	0.485±0.434 [7 / 19]	0.356±0.0299 [15 / 44]
Sodium (Na)	180			41±16 [0 / 19]	23±24 [0 / 44]
Ammonia (NH_3 -N)				0.13±0.17 [NA / 16]	0.104±0.201 [NA / 33]
Un-ionized Ammonia	0.02			0.004±0.006 [1 / 16]	0.003±0.005 [0 / 23]
Nitrate (NO_3-N)		124 / 3.0	32.8 / 3.0	7.24±4.24 [7 / 19]	3.11±2.59 [18 / 40]
Total Phosphorus (TP)	0.03			0.178±0.165 [10 / 19]	0.092±0.079 [32 / 43]
Sulphate (SO_4)			429	46±9 [0 / 19]	52±15 [0 / 43]

Figure 22 Time Series of Selected Water Quality Variables for SWFD3 and SWLTD1 (2020-03-17 to 2021-12-03) for "High Concentrations" (Cl, Na, NO_3-N and SO_4) and "Low Concentrations" (Boron, Cu, Fe, NO_3-N and P-total)









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4.6.4. Indicators of Potential Surface Water Toxicity in Moose Creek

4.6.4.1. Un-ionized Ammonia in Receiving Water at SW1

Since 2016, only two samples have tested with un-ionized ammonia greater than the objective (2020-01-10 [0.032 mg/L] and 2020-08-04 [0.042 mg/L]). There were no exceedances during 2021. Background Moose Creek concentrations at SWMC1 met the PWQO on Jan. 10, 2020 but were 0.026 mg/L on Aug. 4, 2020. There were also no exceedances at SWMC1 during 2021.

4.6.4.2. Other Potentially Toxic Metals and Bio-accumulative Compounds

Summary data for other potentially toxic metals and bio-accumulative organic contaminants in the treated effluent and in the receiving waters downstream of the discharge location are summarized in Table 18 for May 23, 2019 to Dec. 3, 2021. This time period was selected as the sampling in the receiving waters is confirmed to be during discharge events. In summary:

- Cd was detected rarely in the treated effluent and never exceeded the method reporting limit (MRL) in the receiving waters;
- Cr was consistently detected in the effluent and in the receiving waters but none of the receiving water samples exceeded the PWQO;
- Pb was detected about 50% of the time in the treated effluent but only one sample was detected in excess of the PWQO in 2021 at SW1 and that was likely an erroneous value as it was during high flows and was orders of magnitude greater than any other reported values. The corresponding Pb concentration on this date (April 23, 2021) was below detection at SW2 so the Pb value at SW1 was not associated with the effluent discharge. Otherwise, no samples of the receiving water exceeded the PWQO;
- Hg was detected about 20% of the time in the treated effluent but rarely detected in the receiving water and no samples of the receiving water exceeded the PWQO; and,
- None of 1,4-dichloro-benzene, benzene, dichloromethane, toluene and vinyl chloride exceed their respective MRL in either the treated effluent or the receiving waters.

Table 18 Summary of Analytical Results for Potentially Toxic and Bio-accumulative Compounds in the Treated Effluent and Receiving Water – 2019-05-23 to 2021-12-03

Water Quality Parameter	PWQO / Regulatory Limit	Treated Leachate - Exceedance of PWQO / Regulatory Limit	Treated Leachate - Number of samples > MRL/ Number of Samples*	Treated Leachate Mean Concentration ± 1 SD	SW2 Median / 90th Percentile (no. > PWQO / no. > MRL)	SW1 Median / 90th Percentile (no. > PWQO / no. > MRL)
Cadmium (mg/L)	0.0002/NA	0/NA	3/47	0.0001 ± 0.00003	≤MRL	≤MRL
Chromium (mg/L)	0.0089/NA	0/NA	47/47	0.013 ± 0.012	0.006 / 0.011 (0 / 37)	0.003 / 0.005 (0 / 38)
Lead (mg/L)	0.025/ NA	0/NA	29/47	0.0003 ± 0.0006	0.0002 / 0.0005 (0 / 12)	0.0004 / 0.0018 (1 / 13)
Mercury (mg/L)	0.0002/NA	9/NA	11/47	0.00005 ± 0.00004	0.0001 / 0.0001 (0 / 6)	0.00003 / 0.00003 (0 / 2)
1,4-dichloro-benzene (µg/L)	4/NA	0/NA	4/47	≤MRL	≤MRL	≤MRL
Benzene (µg/L)	100/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Dichloromethane (µg/L)	100/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Toluene (µg/L)	0.8/NA	0/NA	0/47	≤MRL	≤MRL	≤MRL
Vinyl chloride (µg/L)	600	0/NA	0/47	≤MRL	≤MRL	≤MRL

*MRL = Method Reporting Limit, #NA = Not Applicable

5. Conclusions

Water quality monitoring in the general vicinity of the EOWHF commenced in 1996 and continued more or less unabated until the end of 2018 with quarterly water quality samples and limited flow information for the water courses. The initial review of the historical data demonstrated that:

- Surface water quality data in advance of the landfill construction and prior to the commencement of treated effluent discharge to Fraser Drain in 2007 was generally sufficient to characterize pre-landfill conditions in Fraser Drain and Moose Creek near EOWHF;
- Since 2007 and through to the end of 2018, water quality samples have continued to be collected in the receiving water courses on a quarterly basis but excluded almost entirely any overlap with periodic treated effluent discharge events in Fraser Drain and Moose Creek;
- Water quantity measurements in the adjacent water courses were extremely limited from 1996 through to 2018; and,
- Since May 2019, in part in response to the need for existing condition monitoring for the "expansion site" as well additional information requirements for the effect of the existing landfill on the receiving waters and the potential effect of the Phase 2 of the existing landfill, water quality and quantity monitoring in the receiving waters was enhanced in 2019 continuing through to 2021.

This report characterized existing conditions of the surface waters with respect to quality in the vicinity of the existing landfill and the expansion site. All sampling locations on Fraser Drain, upstream of the effluent discharge location, were considered as existing conditions unaffected by the existing landfill for the period of record of data. Similarly, Moose Creek sites upstream of the confluence with Fraser Drain were considered as existing conditions uninfluenced by the EOWHF. The Albert Fahey Award Drain site characterizes existing conditions typical of peat and natural forested areas. The Upper-Tayside drain typifies current agricultural land uses in the vicinity of the proposed expansion site including sod farming.

Fraser Drain, downstream of the effluent discharge location and Moose Creek below the confluence with Fraser Drain were considered in four periods to assess trends or changes as a result of the effluent discharge. These periods are:

- pre-discharge (1996 to 2007);
- early discharge without an emphasis of sampling alignment with discharge events monitoring (2007 to 2015);
- discharge following upgrades to the treatment of the effluent but limited sample alignment with discharge events; and,
- 2019 through 2021 monitoring intended to be synoptic monitoring with treated effluent discharge events.

It is important to remember that these water courses have been extensively modified through agricultural drain construction and maintenance and the use of field surface and subsurface drains. This has resulted in

impacts on water quality in these water courses and an altered hydrologic regime which have significantly affected existing conditions *vis a vis* natural or historic conditions. Historic conditions have not been emphasized in this report with the exception of water quality of the Albert-Fahey Award Drain. Throughout the study area, existing water quality conditions in the surface waters are generally poor with high concentrations of TP, Fe, NO_3-N and un-ionized ammonia. Poor quality is exacerbated by extreme hydrologic conditions (rapid runoff altered by agricultural drainage and the construction of straight, un-natural U-shaped channels) that result in extremely low baseflow or even dry-ditch conditions exclusive of any effects of the current landfill.

General time trends for upstream Fraser Drain stations SWFD4, SWFD3, and SWFD2 for the period of record show increasing concentrations for Cl at all three sampling locations. Otherwise, various analytes showed minor increased concentrations for some of Na, TP, SO_4, NH_3-N and Fe over the period of monitoring. The high variability over time for concentrations with these samples is likely associated with flow. The data have been sorted into Group A and Group B characterizing the period of sampling from 1996 to May 8, 2019 and from May 23, 2019 to Dec. 3, 2021, respectively. Median concentrations for SWFD4 Group B (2019-05-23 to 2020-12-09) have:

- doubled for boron (0.010 for Group A to 0.020 mg/L for Group B);
- tripled for NO_3-N (0.940 to 3.378 mg/L for Group A and B, respectively);
- nearly doubled for Cl (18 to 30 mg/L for Group A and B respectively); but,
- showed little change for Cu, Fe, Na, and SO_4; and,
- decreased marginally for NH_3 -N and TP.

In general, median concentrations for SWFD3 Group B (2019-05-23 to 2021-12-03) have increased noticeably for:

- Cl (18 to 30 mg/L for Group A and B respectively);
- NO_3-N (0.97 to 2.27 mg/L for Group A and B, respectively); and,
- SO_4 (34.0 to 54.0 for Group A and B, respectively).
- P-Total increased slightly (0.050 to 0.075 for Group A and B, respectively).

Three stations were selected for evaluation of existing or background conditions in Moose Creek including SWMC1 above the confluence of Moose Creek with Fraser Drain, SWMC2 which is located approximately 1500 m upstream of SWMC1 and approximately 560 m downstream of the confluence of the Albert-Fahey Award Drain with Moose Creek and SWMC3 downstream of the village of Moose Creek and approximately 6.3 km upstream of SW1. It was observed that there is little change in quality between SWMC3 and SWMC2 for the comparable data from May 23, 2019 to Dec. 3, 2021.

SWMC1 has long term data extending from 2005. Increased concentrations of SO_4 are apparent with slight increases over the 16 years of Cl, Na, NO_3-N and NH_3-N. At SWMC2 (upstream and with data since 2006) all variables are similar between the two time periods except for B, NO_3-N and SO_4 which increased post May 23, 2019 while TP was noticeably lower in the latter time period. The patterns noted for NO_3-N and TP are not present downstream at SWMC1. Detailed time series plots for key variables for the three Moose Creek background stations indicate that SO_4 shows a rising trend both for the past 32

months at SWMC3 and for the past 15 years at SWMC2 and SWMC1. Concentrations of SO_4 are now of the order of 50 to 80 mg/L as background. Cl, Na, B, NH_3-N and NO_3-N all show a slight upward trend over the period of record.

The station on the Albert-Fahey Award Drain was initiated in May 2019. This station drains agricultural land, peat extraction land and natural forests and wetlands and contributes to Moose Creek upstream of SWMC2 and thus is more typical of historic natural conditions from peatlands and woodlands in the Moose Creek watershed. The time series for selected water quality variables show no trends for the last 32 months. SWAF1 median and 90th percentile water quality statistics were compared to historic and recent water quality data for SWMC2, the closest downstream station on Moose Creek to the confluence with the Albert-Fahey Drain. It is evident that the Albert-Fahey Award drain is contributing elevated concentrations to Moose Creek of B, Fe, Na, NH_3-N and TP especially relative to samples from the last 32 months of monitoring. B, Fe and TP are an order of magnitude higher than SWMC2 for the period May 23, 2019 to Dec. 3, 2021. Field observations have indicated that the continuous flow at SWAF1 is largely associated with the peat and natural forested areas which are more representative of the historic or baseline water quality for this area. The agricultural land drainage that is more typical of the main drainage area of Moose Creek has higher concentrations of Cl, NO_3-N and SO_4 than the Albert-Fahey Award Drain. Median concentrations at SWAF1 exceed the PWQO for Fe and TP. It is reasonable to conclude that natural water quality of the surface waters (i.e. pre-agriculture and peat extraction) in the vicinity of the EOWHF is somewhat typical of the Albert Fahey Award Drain with higher concentrations of B, Fe, Na, NH_3-N and TP and lower concentrations of Cl, NO_3-N and SO_4 than is currently typical of Moose Creek.

Changes in surface water quality (medians for the data from May 23, 2019 to Dec. 3, 2021) at SW1 relative to upstream Moose Creek quality (SWMC2) indicate the effect of the input of Fraser Drain and the treated effluent discharge to Fraser Drain. These effects can be summarized as follows:

- Boron – median increases from 0.050 to 0.750 mg/L;
- Chloride – median increases from 19 to 102 mg/L;
- Copper – median increases marginally from 0.002 to 0.003 mg/L;
- Iron – median increases marginally from 0.480 to 0.610 mg/L;
- Sodium – median increases from 14 to 118 mg/L;
- Ammonia – median is unchanged from previous at 0.120 to 0.170 mg/L;
- Nitrate – median increases from 3.17 to 32.90 mg/L;
- Phosphorus Total – median increases from 0.050 to 0.106 mg/L; and,
- Sulphate – median increases from 54 to 107 mg/L.

The Upper-Tayside Drain is on the eastern edge of the proposed landfill expansion. It has a catchment area that is predominantly agricultural for both sod farming and row crops. Several surface drains from agricultural land connect with this drain. This location has only been sampled for water quality and measured for flow since March 17, 2020. Based on the mean concentrations, SWLTD1, mean concentrations for 2020-2021 of Cl, Fe, Na, NH_3 -N, NO_3-N and TP were noticeably greater but statistically not different than those of SWFD3 for all samples from 2019 through 2021. Other variables were similar or lower than SWFD3 concentrations.

6. Report Limitations and Use

This Report has been prepared by CanDetec Inc. (Consultant) for the benefit of GFL Environmental Inc. and HDR Corporation (Client) in accordance with the agreement between CanDetec Inc. and the Client, including the scope of work detailed in the proposal and subsequent scope changes to this scope of work.

The information, data, recommendations and conclusions (collectively the "Information") contained in the Report represents CanDetec's professional judgement in light of the Limitations of the information available from the Client and industry standards for the preparation of similar reports. The report may be based on information provided to the Consultant which has not been independently verified; has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued. The Report must be read as a whole and with the primary existing conditions report (CanDetec 2022) report and sections thereof should not be read out of context with the Report and with these limitations.

The Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. The Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of surface water, environmental or geoscience conditions, is not responsible for any variability in such conditions, geographically or over time.

The Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable effects of the activities considered in this Report by the Consultant represent the Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Persons relying on such estimates or opinions do so at their own risk.

Except as agreed to in writing by Consultant and Client; as required by-law; or to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by the Client.

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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

7. Closure

CanDetec is pleased to provide GFL and HDR with this report in accordance with the agreement and the scope of work detailed in the Proposal to undertake this work and any subsequent scope changes to the proposed work. This review was conducted by the undersigned based upon the material contained in the reports referenced herein.

CanDetec appreciates the opportunity to assist GFL and HDR with this critical work to expanding the EOWHF landfill. We trust that this report meets your expectations fully. If you have any questions on this report or identify any omissions or errors in fact that need to be addressed to finalize this report, please provide these to the undersigned.

Thank you again for providing CanDetec with this opportunity.

Report Reviewed By:	**Report Prepared By:**
Original Signed by	*Original Signed by*
Brad Fairley, MES Associate	Dennis J. Gregor PhD., P. Geo. President, Senior Aquatic Scientist

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Appendix A

Summary of Treated Effluent Quality Data for all Water Quality Variables for 2021

Table 1 - Batch Discharge Events 2021						
Discharge Event Number	**Source of Discharge**	**Discharge Date**	**Hours/Day Effluent was Discharged**	**Volume of Discharge (m^3)**	**Rate of Discharge (L/s)**	
23-20	East	January 05,2021	15	2700	50	
		January 06,2021	16.5	2970	50	
			31.5	**5670**		
01-21	West	January 13,2021	17.5	3150	50	
		January 14,2021	16	2880	50	
		January 15,2021	4	720	50	
			37.5	**6750**		
02-21	East	January 26,2021	17.5	3150	50	
		January 27,2021	16.5	2970	50	
			34	**6120**		
03-21	West	February 16,2021	14	2520	50	
		February 17,2021	16	2880	50	
		February 18,2021	7	1260	50	
			37	**6660**		
04-21	East	February 24,2021	17.5	3150	50	
		February 25,2021	16	2880	50	
		February 26,2021	6.25	1125	50	
			39.75	**7155**		
05-21	West	March 15,2021	17.5	3150	50	
		March 16,2021	16	2880	50	
		March 17,2021	6.5	1170	50	
			40	**7200**		
06-21	East	March 29,2021	10.75	1935	50	
		March 30,2021	16	2880	50	
		March 31,2021	7.5	1350	50	
			34.25	**6165**		
07-21	West	April 12,2021	17.5	3150	50	
		April 13,2021	16	2880	50	
		April 14,2021	5	900	50	
			38.5	**6930**		
08-21	East	April 27,2021	12	2160	50	
		April 28,2021	16	2880	50	
		April 29,2021	9	1620	50	
			37	**6660**		
09-21	West	May 7,2021	5.5	990	50	
		May 8,2021	14.5	2610	50	
		May 9,2021	15	2700	50	
		May 10,2021	3	540	50	
			38	**6840**		
10-21	East	May 13,2021	17.5	3150	50	
		May 14,2021	16	2880	50	
			33.5	**6030**		
11-21	East	June 27 - 29	**3,283**			
12-21	East/West/V-Wetlands	July 14 - 23	**18,509**			
V-Wetlands-2021-06/24						
13-21						
14-21						
15-21	East/West/V-Wetlands	October 3 - 11	**14,327**			
16-21						
V-Wetlands-2021-08/19						
17-21	West/NV-Wetlands/V-Wetlands	October 27-November 5	**24,530**			
NV-Wetlands-2021-10/08						
V-Wetlands-2021-08/19						
18-21						
19-21	West	Novemeber 22,2021	15.5	2790	50	
		Novemeber 23,2021	16	2880	50	
			31.5	**5670**		
NV-Wetlands-2021-11/15	NV-Wetlands	November 23,2021	8	1440	50	
		November 24,2021	16	2880	50	
		November 25,2021	6.5	1170	50	
			30.5	**5490**		
20-21	East	December 2,2021	17.5	3150	50	
		December 3,2021	16	2880	50	
			33.5	**6030**		
21-21	West	December 12,2021	10	1800	50	
		Decmeber 13,2021	16	2880	50	
		December 14,2021	5.5	990	50	
			31.5	**5670**		
22-21	East	December 22,2021	17.5	3150	50	
		December 23,2021	16	2880	50	
				6030		
		Total Discharge Volume		**158,436**	**m^3**	

Table 7 - Acute Toxicity Results

Discharge Event #	Sample Date	Sample Type	Sample Location	Parameter	ECA Limit	Result
West Pond-2021-03	Feb 17/2021	Composite	West	Trout	50%	0.0%
				Daphnia	50%	6.7%
East Pond-2021-08	April 19/2021	Composite	East	Trout	50%	0.0%
				Daphnia	50%	0.0%
V-Wetlands-2021-06/24	June 24/2021	Composite	Wetlands	Trout	50%	0.0%
				Daphnia	50%	0.0%
West Pond-2021-17	Oct 19/2021	Composite	West	Trout	50%	0.0%
				Daphnia	50%	0.0%
East Pond-2021-22	Dec 14/2021	Composite	East	Trout	50%	0.0%
				Daphnia	50%	0.0%

Table 5 - Effluent Monitoring and Analytical Results from Discharge Events.

ECA Condition 8(2)

Parameter	PWQO	Units	Discharge Events										
			East	West	East	West	East	West	East	East	West	East	West
			23-20	1	2	3	4	5	6	7	8	9	10
pH (field)	6.5 to 8.5	pH	7.11	7.06	7.45	7.89	7.09	7.27	7.68	7.98	7.91	8.4	7.43
Temperature (field)		°C	2.5	3.9	2.4	2.1	5.8	3.7	10.3	15.5	14.0	15.7	16.5
Dissolved Oxygen (field)	4	mg/L	12.75	12.85	12.08	8.89	10.69	9.35	11.95	11.23	9.95	19.9	10.42
Conductivity (field)		uS/cm	7000	7120	6620	6900	5980	5900	5690	5380	5590	6040	6020
Alkalinity as CaCO3		mg/L	93	67	143	57	120	123	158	218	276	262	258
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	145	158	179	123	132	136	146	164	202	177	198
Chloride		mg/L	639	685	635	582	556	554	501	497	683	465	582
Conductivity		uS/cm	5290	4910	4480	4400	4140	4200	3920	3850	4460.0	3760	4640
Dissolved Organic Carbon		mg/L	50.4	53.1	49.2	26.7	32.0	35.3	39.3	51.2	38.0	36.8	37.4
N-NH3 (Ammonia)	1	mg/L	0.24	0.27	0.21	0.21	0.24	0.31	0.15	0.2	1	0.2	0.25
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	< 1	< 1
N-NO3 (Nitrate)		mg/L	293	307	275	252	247	233	214	213	244.000	193	261
Phenols	0.005	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.005	< 0.002	< 0.002	0	< 0.002	0.005
Sulphate		mg/L	264	240	204	304	218	262	215	178	211	154	242
Total Dissolved Solids		mg/L	3511	3447	3205	3097	2844	2839	2691	2595	185.00	2479	3208
Total Kjeldahl Nitrogen		mg/L	9.2	8.5	8.1	7.3	7.1	6.9	6.9	6.60	7.40	5.60	0.1
Total Phosphorus	0.3	mg/L	0.07	0.06	0.07	0.06	0.06	0.08	0.07	0.06	0	0.09	0.20
Total Suspended Solids	10	mg/L	3	< 3	4	< 3	< 3	< 3	8	< 3	7.0	< 3	4
Calcium		mg/L	115	78.2	48.7	28.9	28	23	26	24.8	35.6	33.0	72
Magnesium		mg/L	108	98.1	89.1	84.3	77	74	69	64.3	82	63.8	81.2
Potassium		mg/L	266	256	240	213	192	195	182	172	226	176	220
Sodium		mg/L	767	691	686	732	606	624	656	586	741.000	576	699
Barium		mg/L	0.384	0.332	0.26	0.318	0.3	0.2	0.2	0.173	0.24	0.161	0.266
Boron		mg/L	4.1	3.76	3.69	3.85	3.4	3.5	3.3	3.20	4	3.34	4.19
Cadmium		mg/L	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Chromium		mg/L	0.014	0.012	0.013	0.011	0.01	0.01	0.011	0.013	0.0140	0.014	0.015
Copper	1	mg/L	0.0013	0.001	0.0012	0.0011	0.001	0	0.001	0.0017	0.002	0.0023	0.0028
Iron	1	mg/L	0.072	0.062	0.069	0.036	0.1	0	0.06	0.058	0.088	0.083	0.11
Lead		mg/L	0.0001	0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	0.000	0.000	0.000	0.0001
Manganese		mg/L	0.01	0.007	0.006	0.006	0.00	0	0	0.001	0.00500	0.001	0
Mercury		mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.000	< 0.00002	< 0.00002
Zinc	0.2	mg/L	0.086	0.077	0.066	0.057	0.07	0	0.05	0.045	0	0.051	0.062
1,4-dichlorobenzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5
Benzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane		µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride		µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3		mg/L	0.0004	0.0004	0.0007	0.0019	0.0005	0.0008	0.0016	0.0067	0.0162	0.0188	0.0025

Table 5 - Effluent Mon							
ECA Condition 8(2)							
Parameter							
	West	**East**	**West**	**NV-Wetlands**	**East**	**West**	**East**
	17	18	19	2021-11-15	20	21	22
pH (field)	8.04	7.86	7.95	8.17	7.84	7.47	7.51
Temperature (field)	11.4	10.1	6.7	6.5	2.9	12.7	1.7
Dissolved Oxygen (field)	11.22	11.48	11.44	12.42	10.88	10.12	12.58
Conductivity (field)	6590	6570	6350	6440	6730	5810	6650
Alkalinity as CaCO3	252	306	349	287	314	292	338
CBOD	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD	161	157	194	165	180	140	214
Chloride	683	647	697	597	586	599	636
Conductivity	4830	4870	5260	4620	4810	4370	5200
Dissolved Organic Carbon	37	40	18.7	40.3	45.9	85.4	41.8
N-NH3 (Ammonia)	0.3	0.19	0.2	0.22	0.22	0.19	0.31
N-NO2 (Nitrite)	< 1	< 1	< 1	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)	316	273	310	264	258	265	297
Phenols	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate	316	263	264	253	214	192	186
Total Dissolved Solids	3661	3442	3685	3270	3128	3039	3604
Total Kjeldahl Nitrogen	6.00	8.80	8.80	6.2	9.0	5.3	10.6
Total Phosphorus	0.06	0.23	0.08	0.14	0.14	0.27	0.12
Total Suspended Solids	5	3.00	3	4	< 3	5	< 3
Calcium	82.4	85	93.5	82.0	76	71.0	94.6
Magnesium	85.1	86.9	90	85.6	83	72	96.5
Potassium	225	242.0	240	229	210	211	253
Sodium	720	724	720	684	627	546	818
Barium	0.171	0	0.166	0.157	0.146	0.139	0.211
Boron	4.55	4.310	4.71	4.49	4.12	3.5	4.80
Cadmium	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Chromium	0.01	0.012000	0.014	0.010	0.013	0.012	0.016
Copper	0.0035	0.004	0.0048	0.0038	0.004	0.004	0.0025
Iron	0.023	0.0370	0.048	0.030	0.041	0.042	0.090
Lead	< 0.0001	0.000	0	< 0.0001	0.0001	0.0002	0
Manganese	0.001	0.00300	0.003	0.003	0.003	0.004	0.006
Mercury	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Zinc	0.057	0.066	0.072	0.066	0.06	0.07	0.09
1,4-dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.0078	0.0031	0.0031	0.0054	0.0019	0.0015	0.0012

Table 1 - Batch Discharge Events 2021

Discharge Event Number	Source of Discharge
23-20	East
01-21	West
02-21	East
03-21	West
04-21	East
05-21	West
06-21	East
07-21	West
08-21	East
09-21	West
10-21	East
11-21	East
12-21	East/West/V-Wetlands
V-Wetlands-2021-06/24	
13-21	
14-21	
15-21	

16-21	East/West/V-Wetlands
V-Wetlands-2021-08/19	
17-21	West/NV-Wetlands/V-Wetlands
NV-Wetlands-2021-10/08	
V-Wetlands-2021-08/19	
18-21	
19-21	West
NV-Wetlands-2021-11/15	NV-Wetlands
20-21	East
21-21	West
22-21	East

Discharge Date	Hours/Day Effluent was Discharged	Volume of Discharge (m^3)	Rate of Discharge (L/s)
January 05,2021	15	2700	50
January 06,2021	16.5	2970	50
	31.5	**5670**	
January 13,2021	17.5	3150	50
January 14,2021	16	2880	50
January 15,2021	4	720	50
	37.5	**6750**	
January 26,2021	17.5	3150	50
January 27,2021	16.5	2970	50
	34	**6120**	
February 16,2021	14	2520	50
February 17,2021	16	2880	50
February 18,2021	7	1260	50
	37	**6660**	
February 24,2021	17.5	3150	50
February 25,2021	16	2880	50
February 26,2021	6.25	1125	50
	39.75	**7155**	
March 15,2021	17.5	3150	50
March 16,2021	16	2880	50
March 17,2021	6.5	1170	50
	40	**7200**	
March 29,2021	10.75	1935	50
March 30,2021	16	2880	50
March 31,2021	7.5	1350	50
	34.25	**6165**	
April 12,2021	17.5	3150	50
April 13,2021	16	2880	50
April 14,2021	5	900	50
	38.5	**6930**	
April 27,2021	12	2160	50
April 28,2021	16	2880	50
April 29,2021	9	1620	50
	37	**6660**	
May 7,2021	5.5	990	50
May 8,2021	14.5	2610	50
May 9,2021	15	2700	50
May 10,2021	3	540	50
	38	**6840**	
May 13,2021	17.5	3150	50
May 14,2021	16	2880	50
	33.5	**6030**	
June 27 - 29	**3,283**		
July 14 - 23	**18,509**		

October 3 - 11	**14,327**		
October 27-November 5	**24,530**		
Novemeber 22,2021	15.5	2790	50
Novemeber 23,2021	16	2880	50
	31.5	**5670**	
November 23,2021	8	1440	50
November 24,2021	16	2880	50
November 25,2021	6.5	1170	50
	30.5	**5490**	
December 2,2021	17.5	3150	50
December 3,2021	16	2880	50
	33.5	**6030**	
December 12,2021	10	1800	50
Decmeber 13,2021	16	2880	50
December 14,2021	5.5	990	50
	31.5	**5670**	
December 22,2021	17.5	3150	50
December 23,2021	16	2880	50
		6030	

Total Discharge Volume **158,436** m^3

Table 2 - Monthly Leachate Volumes Processed (m^3) 2021

Month	Total # of Days in Operation	Total Monthly Influent Flow	Average Daily Influent Flow	Maximum Daily Influent Flow
January	31	14,971	483	528
February	28	10,142	362	480
March	31	14,134	456	528
April	30	16,253	542	600
May	31	19,106	616	672
June	30	12,875	429	672
July	31	14,906	481	672
August	31	14,146	456	485
September	30	3,843	128	240
October	31	14,493	468	672
November	30	20,160	672	672
December	31	20,256	653	672
Total	365	**175,285**	480	574
Average		14,607.08		
Maximum		20,256	672	672

Table 3 - Monthly Raw Leachate Analytical Results

Raw Leachate Inlet to South Aeration Pond

Parameter	PWQO	Units	January	February	March	April	May	June	July	August	September	October	November	December
pH (field)	6.5 to 8.5	pH	7.34	8.43	8.46	8	7.6	7.35	7.28	7.62	7.84	7.63	8.11	8.04
Temperature (field)		°C	8	3.5	12	13.6	23.6	26	23.9	25	19.7	17.3	5.8	4.3
Dissolved Oxygen (field)	<4	mg/L	6.71	12.11	10.82	7.83	8.21	6.52	7.25	7.71	8.89	9.33	10.46	9.52
Conductivity (field)		uS/cm	9160	8590	8290	8020	7160	7220	7210	7340	7090	7120	8050	8280
Alkalinity as CaCO3		mg/L	3520	2790	3030	2320	645	675	667	593	687	1030	2170	1870
CBOD	10	mg/L	11	9	9	31	5	9	< 10	< 10	< 10	9	16	17
COD		mg/L	748	685	707	687	485	414	440	454	402	469	726	780
Chloride		mg/L	845	981	848	922	1200	864	913	915	926	976	1070	887
Conductivity		uS/cm	9130	8770	8660	8140	6800	6900	6840	7070	7010	6900	8510	8300
Dissolved Organic Carbon		mg/L	201	138	146	83	40	54.3	52.8	64.7	50	73.5	154.0	78
N-NH3 (Ammonia)	1	mg/L	495	471	601	296	1	0.39	0.48	0.4	4.2	40.5	305.00	296.0
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	27.40	< 1	< 1	< 1	< 3	14.90	51.9	77.1	77.40
N-NO3 (Nitrate)		mg/L	187	106	79.7	187.0	469.0	431	415	443	390.0	347	187	145.0
Phenols	0.005	mg/L	0.007	< 0.002	< 0.02	0.023	0.007	0.031	< 0.002	< 0.002	0.012	< 0.002	< 0.002	< 0.002
Sulphate		mg/L	91	58	49	< 100	52	51	60	46	52	59	58	42
Total Dissolved Solids		mg/L	6343	5260	5484	5491	5194	4803	4879	4984	4754	5173	5598	4973
Total Kjeldahl Nitrogen		mg/L	531	473	511	310	23	17.4	17.4	22.1	20	57.6	313.0	334
Total Phosphorus	0.3	mg/L	7.92	4.29	4.7	6.40	4.89	4.08	4.41	4.50	4.73	5.05	5.8	6.80
Total Suspended Solids	10	mg/L	6	45	68	96	36	28	190	40	13	31	90	112
Calcium		mg/L	115	65	63	152	158	161	173	159	138	154	137	154
Magnesium		mg/L	82.7	122	120	124	103	119	123	124	122	131	139	129
Potassium		mg/L	242	331	326	345	265	312	325	349	333	389	359	357
Sodium		mg/L	1390	948	1130	1130	952	981	1040	1070	988	1080	1050	1000
Barium		mg/L	0.915	0.7	0.7	0.8	0.6	0.567	0.625	0.788	0.48	0.531	0.70	0.9
Boron	0.2	mg/L	8.99	5.9	6.6	7.0	6.6	6.78	6.62	6.70	6.29	6.87	6.18	< 0.005
Cadmium	0.0002	mg/L	0.000105	< 0.00014	< 0.00014	0	< 0.000070	< 0.000070	0.000088	< 0.000070	< 0.00014	0.000143	0.00009	0
Chromium	0.0089	mg/L	0.075	0.07	0.07	0.06	0.05	0.046	0.043	0.066	0.043	0.041	0.06	0.07
Copper		mg/L	0.257	0.00	0.00	0	0	0.0024	0.0074	0.0047	0.0058	0.0067	0.0082	0.010
Iron	1	mg/L	1.38	1.4	1.6	2.1	1.5	0.826	3.03	2.03	0.65	0.859	1.9	3.6
Lead	0.025	mg/L	0.0057	0	0	0	0	0.0023	0.0024	0.0017	0.0006	0.0006	0.0021	0
Manganese		mg/L	0.105	0.2	0.2	0.3	0.2	0.087	0.27	0.215	0.108	0.202	0.26	0.4
Mercury	0.0002	mg/L	< 0.00002	< 0.00002	0.000	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.0000	< 0.00002	< 0.00002	0.0000
Zinc	0.2	mg/L	0.228	0.1	0.1	0.1	0	0.104	0.137	0.162	0.132	0.126	0.15	0.2
1,4-dichlorobenzene	4	µg/L	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	100	µg/L	2.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	100	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	0.8	µg/L	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	600	µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L	2.079	16.483	42.989	8.610	0.023	0.006	0.006	0.012	0.132	0.671	6.237	4.580

ECA Condition 8(2)

Parameter	ECA	Units	Discharge Events																									
Discharge Event			**East 23-20**	**West 01-21**	**East 02-21**	**West 03-21**	**East 04-21**	**West 05-21**	**East 06-21**	**West 07-21**	**East 08-21**	**West 09-21**	**East 10-21**	**East 11-21**	**West 12-21**	**V-Wetlands**	**East 14-21**	**West 15-21**	**East 16-21**	**V-Wetlands**	**NV-Wetlands**	**West 17-21**	**East 18-21**	**West 19-21**	**NV-Wetlands**	**East 20-21**	**West 21-21**	**East 22-21**
pH (field)	6.5 to 8.5	pH	6.8	6.92	7.27	7.13	7.21	7.27	6.89	7.55	7.13	7.95	7.37	7.45	7.49	8.3	8.03	7.78	7.83	7.86	8	7.68	7.42	7.1	7.96	7.66	7.31	6.64
Temperature (field)		°C	4.3	5.6	2.8	2.1	2.3	3.5	15.7	17.2	16.4	16.4	16.5	21.8	20.7	21.1	26.1	20.9	22.1	23.9	15.5	18.4	14.2	12	7.4	8.2	2.7	8.7
Dissolved Oxygen (field)	4	mg/L	12.62	11.15	10.05	9.65	9.1	9.18	12.02	15.71	8.14	13.27	10.18	7.46	12.55	9.86	11.9	9.42	9.73	8.85	9.78	10.48	10.71	9.84	10.73	10.63	10.09	10.39
Conductivity (field)		uS/cm	8150	7420	6200	6350	6210	5730	5790	5340	5680	5940	5410	7540	7530	7030	7120	7010	6980	6840	6680	7010	6530	6650	6290	6470	6880	6890
Alkalinity as CaCO3		mg/L	91	66	137	91	61	136	158	226	236	308	217	279	239	261	279	350	286	325	220	241	296	310	256	315	281	303
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	194	142	168	156	150	161	146	139	186	196	140	251	215	190	182	176	215	186	166	171	168	189	155	183	165	201
Chloride		mg/L	776	748	631	387	564	565	501	537	530	605	454	714	661	622	587	641	567	607	630	662	655	601	614	630	551	560
Conductivity		uS/cm	5470	4920	4440	4330	4540	4220	3920	4150	4240	4290	3200	5720	5200	4980	4900	4920	4460	5020	5010	5080	4720	4820	4590	4980	4360	4760
Dissolved Organic Carbon		mg/L	48	46.3	49.3	31.8	29.8	33.2	39.3	47.5	46.2	22	29.4	33.2	35.6	32.3	31.4	33.1	35.0	34.3	33	23	22	35.3	45.8	27	41.0	47
N-NH3 (Ammonia)	1	mg/L	0.25	0.24	0.18	0.19	0.22	0.27	0.15	0.20	0.44	0.21	0.10	0.48	0.29	0.26	0.23	0.20	0.24	0.27	0.24	0.22	0.16	0.18	0.15	0.200	0.26	0.29
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6.50	< 1	< 1	1.3	1.20	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1.20
N-NO3 (Nitrate)		mg/L	346	319	259	171	247	242	214	227	233	247	189	368	332	288	294	283	265	269	272	279	294	267	282	274	255	269
Phenols	0.005	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002	< 0.002	0.003	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate		mg/L	323	254	197	165	296	243	215	190	183	203	180	282	295	378	209	198	175	245	300	289	273	217	272	227	177	146
Total Dissolved Solids		mg/L	3975	3631	3099	2189	3134	2908	2691	2815	2877	3087	2283	4068	3687	3591	3413	3402	3469	3512	3434	3479	3504	3310	3375	3393	2961	3096
Total Kjeldahl Nitrogen		mg/L	10.2	8.3	7.6	8	8	7.5	6.9	5.7	7.9	6.9	6.0	8.9	8.5	7.80	9.10	9.60	7.70	8.9	4.5	8.50	7.4	9.7	6	7	5.1	9.4
Total Phosphorus	0.3	mg/L	0.07	0.28	0.18	0.09	0.07	0.10	0.07	0.10	0.13	0.13	0.10	0.17	0.16	0.07	0.09	0.21	0.09	0.05	0.08	< 0.01	0.07	0.2	0.05	0.13	0.17	0.12
Total Suspended Solids	10	mg/L	< 3	6	< 3	< 3	3	3	8	< 3	< 3	< 3	3	< 3	6	4	5	3	4	6	3	4	5	< 3	< 3	5	3	< 3
Calcium		mg/L	117	82	48	26.1	30.3	26	26	26	28	38.2	38	105	97	91.3	92.2	85.8	91.4	83.8	80.2	86	86.6	92.5	85	86	74	83
Magnesium		mg/L	113	103	87	70.8	87.8	76	69	71	68	72	53	94	79	82.9	86.9	81.7	89.4	94.1	88.2	84.6	91	85	83	90	76	87
Potassium		mg/L	291	288	239	191	223	188	182	202	188	201	140	254	222	230	240	225	220	249	234	239	235	240	217	231	199	213
Sodium		mg/L	767	701	665	539	802	656	656	647	686	687	450	816	713	754	773	706	981	848	763	737	684	706	702	725	588	631
Barium		mg/L	0.4	0.4	0.3	0.265	0.332	0.2	0.22	0.21	0.2	0.199	0.1	0.3	0.3	0.202	0.208	0.156	0.164	0.172	0.181	0.182	0.17	0.159	0.162	0.2	0.138	0.171
Boron		mg/L	4.4	3.9	3.6	3.01	4.02	3.6	3.3	3.5	3.5	3.79	2.7	5.0	4	4.77	4.77	4.51	4.78	5.27	4.59	4.54	4.61	4.47	4.39	4.7	3.66	4.1
Cadmium		mg/L	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Chromium		mg/L	0.02	0.01	0.01	0.013	0.01	0.01	0.011	0.012	0.01	0.016	0.01	0.02	0	0.011	0.013	0.011	0.013	0.011	0.01	0.011	0.011	0.013	0.011	0.01	0.012	0.015
Copper	1	mg/L	0.0016	0	0.001	0.0017	0.0009	0.001	0.001	0.002	0.00	0.0015	0.00	0	0	0.0062	0.0028	0.0035	0.0032	0.0067	0.0039	0.0036	0.0040	0.0026	0.0041	0.00	0.0026	0.0023
Iron	1	mg/L	0.0790	0	0.07	0.065	0.036	0	0.06	0.07	0.1	0.099	0	0	0.1	0.043	0.042	0.027	0.060	0.035	0.022	0.03	0.037	0.052	0.025	0.1	0.059	0.073
Lead		mg/L	0.0003	0	0.000	0.0001	0.0002	0	< 0.0001	0.000	0	0.0002	0	0	0.0	0	< 0.0001	0	< 0.0001	0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0	0.0001
Manganese		mg/L	0.01	0	0.01	0.006	0.009	0	0	0	0.0	0.001	0	0	0	0.004	0.004	0.004	0.003	0.002	0.002	0.002	0.003	0.003	0.002	0.00	0.006	0.005
Mercury		mg/L	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	0.0000	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Zinc	0.2	mg/L	0.09	0	0.08	0.073	0.063	0.1	0.05	0.05	0.05	0.0015	0	0	0.08	0.049	0.062	0.056	0.073	0.091	0.055	0.054	0.070	0.075	0.058	0.08	0.072	0.083
1,4-dichlorobenzene		µg/L	< 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	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene		µg/L	< 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	< 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
Dichloromethane		µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene		µg/L	< 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	< 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
Vinyl Chloride		µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3		mg/L	0.0002	0.0003	0.0004	0.0003	0.0004	0.0007	0.0004	0.0027	0.0022	0.0067	0.0009	0.0073	0.0045	0.0249	0.0172	0.0060	0.0088	0.0120	0.0080	0.0044	0.0013	0.0006	0.0025	0.0018	0.0007	0.0003

Table 5 - Effluent Monitoring and Analytical Results from Discharge Events.

ECA Condition 8(2)

Parameter	PWQO	Units	Discharge Events										
			East	West	East	West	East	West	East	East	West	East	West
			23-20	1	2	3	4	5	6	7	8	9	10
pH (field)	6.5 to 8.5	pH	7.11	7.06	7.45	7.89	7.09	7.27	7.68	7.98	7.91	8.4	7.43
Temperature (field)		°C	2.5	3.9	2.4	2.1	5.8	3.7	10.3	15.5	14.0	15.7	16.5
Dissolved Oxygen (field)	4	mg/L	12.75	12.85	12.08	8.89	10.69	9.35	11.95	11.23	9.95	19.9	10.42
Conductivity (field)		uS/cm	7000	7120	6620	6900	5980	5900	5690	5380	5590	6040	6020
Alkalinity as CaCO3		mg/L	93	67	143	57	120	123	158	218	276	262	258
CBOD	10	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD		mg/L	145	158	179	123	132	136	146	164	202	177	198
Chloride		mg/L	639	685	635	582	556	554	501	497	683	465	582
Conductivity		uS/cm	5290	4910	4480	4400	4140	4200	3920	3850	4460.0	3760	4640
Dissolved Organic Carbon		mg/L	50.4	53.1	49.2	26.7	32.0	35.3	39.3	51.2	38.0	36.8	37.4
N-NH3 (Ammonia)	1	mg/L	0.24	0.27	0.21	0.21	0.24	0.31	0.15	0.2	1	0.2	0.25
N-NO2 (Nitrite)		mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	< 1	< 1
N-NO3 (Nitrate)		mg/L	293	307	275	252	247	233	214	213	244.000	193	261
Phenols	0.005	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.005	< 0.002	< 0.002	0	< 0.002	0.005
Sulphate		mg/L	264	240	204	304	218	262	215	178	211	154	242
Total Dissolved Solids		mg/L	3511	3447	3205	3097	2844	2839	2691	2595	185.00	2479	3208
Total Kjeldahl Nitrogen		mg/L	9.2	8.5	8.1	7.3	7.1	6.9	6.9	6.60	7.40	5.60	0.1
Total Phosphorus	0.3	mg/L	0.07	0.06	0.07	0.06	0.06	0.08	0.07	0.06	0	0.09	0.20
Total Suspended Solids	10	mg/L	3	< 3	4	< 3	< 3	< 3	8	< 3	7.0	< 3	4
Calcium		mg/L	115	78.2	48.7	28.9	28	23	26	24.8	35.6	33.0	72
Magnesium		mg/L	108	98.1	89.1	84.3	77	74	69	64.3	82	63.8	81.2
Potassium		mg/L	266	256	240	213	192	195	182	172	226	176	220
Sodium		mg/L	767	691	686	732	606	624	656	586	741.000	576	699
Barium		mg/L	0.384	0.332	0.26	0.318	0.3	0.2	0.2	0.173	0.24	0.161	0.266
Boron		mg/L	4.1	3.76	3.69	3.85	3.4	3.5	3.3	3.20	4	3.34	4.19
Cadmium		mg/L	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Chromium		mg/L	0.014	0.012	0.013	0.011	0.01	0.01	0.011	0.013	0.0140	0.014	0.015
Copper	1	mg/L	0.0013	0.001	0.0012	0.0011	0.001	0	0.001	0.0017	0.002	0.0023	0.0028
Iron	1	mg/L	0.072	0.062	0.069	0.036	0.1	0	0.06	0.058	0.088	0.083	0.11
Lead		mg/L	0.0001	0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	0.000	0.000	0.000	0.0001
Manganese		mg/L	0.01	0.007	0.006	0.006	0.00	0	0	0.001	0.00500	0.001	0
Mercury		mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.000	< 0.00002	< 0.00002
Zinc	0.2	mg/L	0.086	0.077	0.066	0.057	0.07	0	0.05	0.045	0	0.051	0.062
1,4-dichlorobenzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5
Benzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane		µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride		µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3		mg/L	0.0004	0.0004	0.0007	0.0019	0.0005	0.0008	0.0016	0.0067	0.0162	0.0188	0.0025

Table 5 - Effluent Mon

ECA Condition 8(2)

Parameter							
	West	**East**	**West**	**NV-Wetlands**	**East**	**West**	**East**
	17	18	19	2021-11-15	20	21	22
pH (field)	8.04	7.86	7.95	8.17	7.84	7.47	7.51
Temperature (field)	11.4	10.1	6.7	6.5	2.9	12.7	1.7
Dissolved Oxygen (field)	11.22	11.48	11.44	12.42	10.88	10.12	12.58
Conductivity (field)	6590	6570	6350	6440	6730	5810	6650
Alkalinity as CaCO3	252	306	349	287	314	292	338
CBOD	< 3	< 3	< 3	< 3	< 3	< 3	< 3
COD	161	157	194	165	180	140	214
Chloride	683	647	697	597	586	599	636
Conductivity	4830	4870	5260	4620	4810	4370	5200
Dissolved Organic Carbon	37	40	18.7	40.3	45.9	85.4	41.8
N-NH3 (Ammonia)	0.3	0.19	0.2	0.22	0.22	0.19	0.31
N-NO2 (Nitrite)	< 1	< 1	< 1	< 1	< 1	< 1	< 1
N-NO3 (Nitrate)	316	273	310	264	258	265	297
Phenols	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate	316	263	264	253	214	192	186
Total Dissolved Solids	3661	3442	3685	3270	3128	3039	3604
Total Kjeldahl Nitrogen	6.00	8.80	8.80	6.2	9.0	5.3	10.6
Total Phosphorus	0.06	0.23	0.08	0.14	0.14	0.27	0.12
Total Suspended Solids	5	3.00	3	4	< 3	5	< 3
Calcium	82.4	85	93.5	82.0	76	71.0	94.6
Magnesium	85.1	86.9	90	85.6	83	72	96.5
Potassium	225	242.0	240	229	210	211	253
Sodium	720	724	720	684	627	546	818
Barium	0.171	0	0.166	0.157	0.146	0.139	0.211
Boron	4.55	4.310	4.71	4.49	4.12	3.5	4.80
Cadmium	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Chromium	0.01	0.012000	0.014	0.010	0.013	0.012	0.016
Copper	0.0035	0.004	0.0048	0.0038	0.004	0.004	0.0025
Iron	0.023	0.0370	0.048	0.030	0.041	0.042	0.090
Lead	< 0.0001	0.000	0	< 0.0001	0.0001	0.0002	0
Manganese	0.001	0.00300	0.003	0.003	0.003	0.004	0.006
Mercury	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Zinc	0.057	0.066	0.072	0.066	0.06	0.07	0.09
1,4-dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Calculated Un-ionized Ammonia as NH_3	0.0078	0.0031	0.0031	0.0054	0.0019	0.0015	0.0012

Table 6 - Receiver Stream Monitoring and Analytical Results

Parameter	ECA	Units	Dates and Location		Dates and Location		Dates and Location		Dates and Location	
			Feb 22/21		April 28/21		October 27/21		Dec 23/21	
			SW-2 (Downstream)	SW-3 (Upstream)	SW-2 (Downstream)	SW-3 (Upstream)	SW-2 (Downstream)	SW-3 (Upstream)	SW-2 (Downstream)	SW-3 (Upstream)
pH (field)	6.5 to 8.5	pH	7.49	6.5	7.85	7.28	7.67	7.5	6.73	
Temperature (field)		°C	2	2.7	12.5	12.1	12.1	13	3.5	
Dissolved Oxygen (field)	< 4	mg/L	11.56	10.5	10.22	10.4	10.86	11.63	10.74	
Conductivity (field)		uS/cm	2020	920	3610	474	1296	653	4150	
Alkalinity as CaCO3		mg/L	53	158	297	169	206	166	339	
CBOD	10.0	mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3	
COD		mg/L	110	243	147	64	49	28	148	
Chloride		mg/L	531	44	486	23	107	32	421	
Conductivity (lab)		uS/cm	4050	554	580	473	1220	597	3750	
Dissolved Organic Carbon		mg/L	28.8	13	36.8	20.4	21.1	15.1	37.5	
N-NH3 (Ammonia)	1.0	mg/L	0.20	0	0.63	0.22	0.15	0.06	0.42	
N-NO2 (Nitrite)		mg/L	< 1	< 1	5.10	< 0.1	< 0.1	< 0.1	< 1	
N-NO3 (Nitrate)		mg/L	232.00	3	192.00	1.80	40.4	11.70	184	
Phenols	0.005	mg/L	< 0.002	< 0.002	0.003	0	< 0.002	< 0.002	< 0.002	
Sulphate		mg/L	277	46	184	38	112	57	165	
Total Dissolved Solids		mg/L	2807	481	167	282	785	364	2459	
Total Kjeldahl Nitrogen		mg/L	4.8	5	7.8	1.5	2.8	2	8.1	
Total Phosphorus	0.3	mg/L	0.10	3	0.15	0.17	0.28	0.14	0.69	
Total Suspended Solids	10.0	mg/L	8	1660	15	37	9	6	19	**sampling location was frozen to depth**
Calcium		mg/L	26	129	65	80	99.2	91	118	
Magnesium		mg/L	78	43	71	11	25.3	11	68	
Potassium		mg/L	196	30	175	3	33.8	5	203	
Sodium		mg/L	639	19	592	14	103	16	465	
Barium		mg/L	0.29	0	0.21	0.07	0.07	0.06	0.2	
Boron		mg/L	3.54	0	3.30	0.03	0.615	0.05	2.9	
Cadmium		mg/L	< 0.000070	0	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	
Chromium		mg/L	0.011	0	0.012	0.005	0.003	< 0.001	0.01	
Copper	0.2	mg/L	0.001	0	0.002	0.005	0.0039	0.002	0.010	
Iron	1.0	mg/L	0.05	60	0.41	2.52	0.562	0.15	0.43	
Lead		mg/L	0.000	0	0.000	0.00	0.0004	< 0.0001	0.001	
Manganese		mg/L	0.01	2	0.04	0.28	0.028	0.01	0.05	
Mercury		mg/L	< 0.00002	0	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
Zinc	0.2	mg/L	0.04	0	0.04	0.01	0.017	0.01	0.05	
1,4-dichlorobenzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Benzene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dichloromethane		µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Toluene		µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Vinyl Chloride		µg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Calculated Un-ionized Ammonia as NH_3		mg/L	0.0007	0.0002	0.0120	0.0011	0.0018	0.0005	0.0003	

Table 7 - Acute Toxicity Results

Discharge Event #	Sample Date	Sample Type	Sample Location	Parameter	ECA Limit	Result
West Pond-2021-03	Feb 17/2021	Composite	West	Trout	50%	0.0%
				Daphnia	50%	6.7%
East Pond-2021-08	April 19/2021	Composite	East	Trout	50%	0.0%
				Daphnia	50%	0.0%
V-Wetlands-2021-06/24	June 24/2021	Composite	Wetlands	Trout	50%	0.0%
				Daphnia	50%	0.0%
West Pond-2021-17	Oct 19/2021	Composite	West	Trout	50%	0.0%
				Daphnia	50%	0.0%
East Pond-2021-22	Dec 14/2021	Composite	East	Trout	50%	0.0%
				Daphnia	50%	0.0%

Stormwater sampling Events

Parameter	C of A	Units	Grab SWM 1	Grab SWM 2
pH		pH		
Temperature		°C		
Dissolved Oxygen		mg/L		
Conductivity		uS/cm		
Alkalinity as CaCO3		mg/L		
BOD		mg/L		
COD		mg/L		
Chloride		mg/L		
Conductivity (Lab)		uS/cm		
Dissolved Organic Carbon		mg/L		
N-NH3 (Ammonia)		mg/L		
N-NO2 (Nitrite)		mg/L		
N-NO3 (Nitrate)		mg/L		
pH (Lab)		pH		
Phenols	0.001	mg/L		
Sulphate		mg/L		
Total Dissolved Solids		mg/L		
Total Kjeldahl Nitrogen		mg/L		
Total Phosphorus		mg/L		
Total Suspended Solids		mg/L		
Calcium		mg/L		
Magnesium		mg/L		
Potassium		mg/L		
Sodium		mg/L		
Barium		mg/L		
Boron		mg/L		
Cadmium		mg/L		
Chromium		mg/L		
Copper	0.005	mg/L		
Iron (dissolved)		mg/L		
Iron (total)		mg/L		
Lead		mg/L		
Manganese		mg/L		
Nickel		mg/L		
Mercury		mg/L		
Zinc	0.03	mg/L		
1,4-dichlorobenzene		µg/L		
Benzene		µg/L		
Dichloromethane		µg/L		
Toluene		µg/L		
Vinyl Chloride		µg/L		
Calculated Un-ionized Ammonia as NH_3	0.02	mg/L		

1.0 SUMMARY OF MAINTENANCE ACTIVITIES

Routine preventative maintenance was performed on the plant equipment during the reporting period. Below are some highlights of the routine maintenance performed:

< The PST influent valves located prior to the PST are dismantled and cleaned monthly, or at a time when flow regulation becomes a problem.
< The chemical feed pumps are calibrated weekly, and a daily measure of the amount of chemical being used is also performed and recorded.
< The gas sensors are calibrated by a qualified technician on a yearly basis, and monthly checks on the emergency ventilation system are performed by the operator.
< The flow meters (quantity of 4) are calibrated by a qualified technician on a yearly basis.
< pH meters are checked against a hand held meter for accuracy and are calibrated if the check proves that there is a discrepancy in the readings.
< Blowers for the SMBRS are inspected daily for excessive noise or heat. Oil is changed every 8000 hours, as recommended by the manufacturer

The following are highlights of more substantial maintenance activities:

Aerators in the South and South-east Aeration ponds were extracted, cleaned of any debris and replaced in the ponds. Any seized aerator pumps were fixed.

Appendix B

Water Quality and Quantity Sampling In the Study Area in 2019, 2020 and 2021

2019	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2019-3-11	SW2, SWFD3,		SW2, SWFD3	
2019-5-8	SW2, SWFD3,		SW2, SWFD3	
2019-5-23	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD2, SWFD4, SWD2, SWMC1, SWMC2, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW4
2019-6-6	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SWFD3
2019-6-19	SWFD3, SWFD2, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-7-10		SW1, SW2, SWAF1, SWFD3,	SW1, SW2, SWFD3, SWAF1	
2019-7-12	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC4
2019-8-8	SWFD3, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD3, SWFD2, SWD2, SWMC1, SWMC2A, SWND3, SWMC3, SWAF1,	
2019-8-23	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-8-27	SW1, SW2, SWFD3, SWMC1,		SW1, SW2, SWFD3, SWMC1,	
2019-8-30	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-3	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-4		SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	

2019	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2019-9-6	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-10	SW1, SW2, SWFD3, SWMC1		SW1, SW2, SWFD3, SWMC1	
2019-9-23	SWFD3, SWFD2, SWFD4, SWD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWFD4, SWFD3, SWMC3,	SWFD3, SWFD2, SWFD4, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-10-10	SW1, SW2, SWFD3, SWFD4, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD2, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC2A
2019-10-15	SW1, SW2, SWFD3, SWMC1,		SW1, SW2, SWFD3,*	
2019-10-18	SW1, SW2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC4, SWMC3, SWAF1	SW1, SW2, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD4, SWD2, SWMC1*, SWMC2A, SWMC4, SWMC3, SWAF1	SWMC4
2019-10-22	SW1, SW2, SWFD3, SWMC1,		SWFD3*, SWMC1*	
2019-10-25	SW1, SW2, SWFD3, SWMC1,	SW1, SW2, SWFD3,	SWFD3*, SWMC1*,	
2019-10-29	SW1, SW2, SWFD3, SWMC1,		SWFD3*, SWMC1*	
2019-10-31	SW1, SW2, SWFD3, SWMC1,	SW1, SW2, SWFD3	SWFD3*, SWMC1*	
2019-11-6	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4 SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWND3, SWMC4, SWMC3, SWAF1	SWMC1
2019-12-11	SW1, SW2, SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	SW1, SW2, SWT1, SWAF1, SWFD4, SWFD3, SWMC3	SWFD3, SWFD2, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWMC4, SWMC3, SWAF1	SWMC3
2020	**Quality Stations**	**Quantity Stations**	**Field Measurements**	**Field Duplicate Station**
2020-01-10	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1,	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1,	SW1
2020-01-22	SW2		SW2	
2020-02-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1,	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3,	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1,	SW1
2020-03-16	SW2, SWFD3		SW2, SWFD3	
2020-03-17	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3,	SW1, SW2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3,	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1

2020	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
	SWD2, SWT1, SWAF1, SWLTD1	SWT1, SWAF1, SWLTD1		
2020-04-07	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWD2, SWT1, SWAF1, SWMC3, SWAF1, SWLTD1	SWMC1
2020-05-02	SW2, SWFD3		SW2, SWFD3	
2020-05-08	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SWMC5[10]
2020-05-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2020-07-30	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWMC5
2020-08-04	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2019-08-26	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1
2020-10-13	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWFD4
2020-11-03	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWT1, SWAF1, SWLTD1	SWMC2A
2020-12-08	SW2, SWFD3		SW2, SWFD3	
2020-12-09	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWMC1, SWMC2A, SWMC3, SWD2, SWT1, SWAF1, SWLTD1	SW1

[10] *SWMC5 is a new station required by MECP as of the summer of 2020. It is located downstream of SW1 and accordingly is outside of the study area for the existing conditions report. However, any QA/QC data collected at this location has been included in this report.*

2020	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2021	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2021-01-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1		SW1
2021-02-05	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SW2
2021-03-30	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SW1
2021-04-21	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SWMC2A
2021-05-14	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SWMC2A
2021-06-28	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SWMC2A
2021-07-15	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SW2
2021-10-06	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWMC3, SWMC4, SWT1, SWAF1, SWND3, SWLTD1, SWMC5	SWFD3
2021-11-04	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3, SWAF1, SWLTD1		SWMC5

2020	Quality Stations	Quantity Stations	Field Measurements	Field Duplicate Station
2021-12-03	SW1, SW2, SWFD2, SWFD3, SWFD4, SWD2, SWMC1, SWMC2A, SWT1, SWAF1, SWMC5	SW1, SW2, SWFD2, SWFD3, SWFD4, SWFD2, SWMC3,		SWMC1

Appendix C

Quality Assurance / Quality Control Data for Study Area for 2019-05-23 to 2021-12-03

Field Duplicate Results - 2019 - 2021																							
Field Duplicate Results - 2019 - 2021																							
Lab ID			**1428329**	**1428334**		**1431585**	**1431595**		**1434217**	**1434220**		**1440939**	**1440946**		**1455467**	**1455468**		**1459463**	**1459466**		**1460887**	**1460894**	
Sample Location			**SW4**	**DUP-1**		**SWFD3**	**DUP-1**		**SWMC2A**	**DUP-1**		**SWMC4**	**DUP-1**		**SWMC2A**	**DUP**		**SWMC2A**	**DUP-1**		**SWMC4**	**DUP**	
Sample Date			**2019-05-23**	**2019-05-23**		**2019-06-06**	**2019-06-06**		**2019-06-19**	**2019-06-19**		**2019-07-12**	**2019-07-12**		**2019-09-23**	**2019-09-23**		**2019-10-10**	**2019-10-10**		**2019-10-18**	**2019-10-18**	
Analyte	Units	MRL			**RPD**			**RPD**			**RPD**			**RPD**			**RPD**			**RPD**			**RPD**
1,2-dichloroetha	%	0	94	95	0.71	100	100	0										98.4	101	2.61			
1,4-dichlorobenz	ug/L	0.4	<0.4	<0.4	N/A	<0.4	<0.4	N/A										<0.4	<0.4	NA			
4-bromofluorobe	%	0	91	103	8.42	115	123	6.72										97	98	1.03			
Ag	mg/L	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA
Al (dissolved)	mg/L	0.01	0.02	0.02	0	<0.01	<0.01	N/A	<0.01	<0.01	N/A	0.02	0.02	0	<0.01	<0.01	N/A	<0.01	<0.01	NA	0.08	0.09	
Alkalinity as CaC	mg/L	5	145	145	0	171	171	0	196	194	1.03	151	164	8.25	179	179	0	200	209	4.4	176	173	1.72
As	mg/L	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	0	0	0	<0.001	<0.001	N/A	0	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA
B	mg/L	0.01	0.02	0.01	40	0.02	0.02	0	0.04	0.04	0	0.03	0.03	0	0.11	0.11	0	0.07	0.07	0	0.03	0.03	0
Ba	mg/L	0.01	0.04	0.04	0	0.05	0.05	0	0.08	0.09	11.76	0.09	0.08	11.76	0.06	0.06	0	<0.5	<0.5		0.05	0.09	57.14
Benzene	ug/L	0.5	<0.5	<0.5	N/A	<0.5	<0.5	N/A															
Ca	mg/L	1	70	70	0	74	73	1.36	89	88	1.13	73	74	1.36	62	62	0	76	77	1.31	121	120	0.83
CBOD5	mg/L	1	5	3	30.77	5	2	85.71	11	3	114.29	<1	<1	N/A	1	4	120	3	5	50	5	9	57.14
Cd	mg/L	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001		<0.0001	<0.0001	NA
Cl	mg/L	1	20	20	0	24	24	0	20	20	0	18	18	0	14	14	0	19	20	5.13	22	22	0
Co	mg/L	0	<0.0002	<0.0002	N/A	<0.0002	<0.0002	N/A	0	0	42.11	0	0	0	0	0	0	0	0		0	0	0
COD	mg/L	5	38	38	0	42	40	4.88	31	47	41.03	31	18	53.06	48	44	8.7	29	30	3.39	40	31	25.35
Conductivity	uS/cm	5	370	380	1.79	420	420	0	520	516	0.77	496	474	4.54	428	432	0.93	505	505	0	736	739	0.41
Cr	mg/L	0	0	0	0	<0.001	<0.001	N/A	0	0.01	40	<0.001	<0.001	N/A	0	0	66.67	0	0	0	<0.001	<0.001	NA
Cu	mg/L	0	0	0	0	0	0	0	0.01	0.01	35.29	0	0	0	0	0	0	0	0	0	0	0	0
Dichloromethane	ug/L	4	<4.0	<4.0	N/A	<4.0	<4.0	N/A										<4.0	<4.0	NA			
DOC	mg/L	0.5	14.8	13.9	4.14	16.7	16.4	1.81	14.4	14.9	3.41	11.6	12.2	5.04	18.6	18.3	1.63	13.6	13.4	1.48	11.1	11.2	0.9
Fe	mg/L	0.03	0.31	0.28	6.67	0.28	0.29	3.51	2.58	3.62	33.55	0.43	0.43	0	0.71	0.72	1.4	0.74	0.76	2.67	0.25	0.26	3.92
Filtration			Y	Y	N/A	Y	Y		Y	Y		Y	Y		Y	Y		Y	Y	2.67	Y	Y	
Hardness as CaC	mg/L	1	204	208	1.3	222	219	1.36	272	269	1.11	215	218	1.39	208	208	0	247	250	1.21	368	366	0.54
Hg	mg/L	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	0	<0.0001	<0.0001	NA
K	mg/L	1	1	1	0	1	1	0	3	3	0	4	4	0	4	4	0	4	4	0	6	5	18.18
Mg	mg/L	1	7	8	9.09	9	9	0	12	12	0	8	8	0	13	13	0	14	14		16	16	0
Mn	mg/L	0.01	0.06	0.05	11.76	0.11	0.11	0	0.13	0.16	20.69	0.06	0.05	18.18	0.1	0.1	0	0.04	0.04	0	0.07	0.07	0
Na	mg/L	2	10	10	0	12	13	8	13	12	8	8	8	0	16	15	6.45	18	18	1.56	8	7	13.33
N-NH3	mg/L	0.01	0.02	0.02	0	0.04	0.04	14.63	0.17	0.18	5.71	0.09	0.08	11.76	0.19	0.19	0	0.13	0.13	NA	0.07	0.06	25.4
-NH3 (un-ionized ammonia)															0.01	0.01							
N-NO2	mg/L	0.1	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<0.10		<0.10	<0.10	NA
N-NO3	mg/L	0.1	2.49	2.49	0	1.99	2.01	1	2.64	2.6	1.53	9.6	9.56	0.42	0.23	0.24	4.26	1.08	1.11	#REF!	13	13	0
P	mg/L	0	0.09	0.07	18.4	0.08	0.08	7.41	0.2	0.3	38.38	0.12	0.1	19.05	0.09	0.09	6.74	0.05	0.06	7.55	0.05	0.05	2.11
Pb	mg/L	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	0	0	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA
pH		1	8.14	8.16	0.16	8.19	8.26	0.85	8.11	8.07	0.49	8.09	8.1	0.12	8.06	8.05	0.12	8.55	8.55	0	7.7	7.68	0.26
Phenols	mg/L	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	0.01	0	22.22	<0.001	<0.001	NA	<0.001	<0.001	NA
Se	mg/L	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA
SO4	mg/L	1	31	31	0	33	33	0	38	38	0	36	37	2.74	29	29	0	43	42	2.35	131	132	0.76
TDS (COND - CAL	mg/L	1	240	247	1.93	273	273	0	338	335	0.89	322	308	4.44	278	281	1.07	328	328	0	478	480	0.42
Toluene	ug/L	0.5	<0.5	<0.5	N/A	<0.5	<0.5	N/A				1.73	1.28	29.9				<0.5	<0.5				
Toluene-d8	%	0	96	95	0.7	102	107	4.78										93	91	2.17			
Total Kjeldahl Ni	mg/L	0.15	1.3	1.1	10.81	1.09	1.49	31.01	1.09	1.14	4.48				1.3	1	26.09	1.01	1.09	7.62	1.51	1.36	10.45
Total P - Soluble	mg/L	0	0.04	0.04	11.76	0.08	0.07	8.2	0.03	0.04	11.76	0.06	0.06	0	0.04	0.04	5.41	0.02	0.02	4.65	0.02	0.02	12.5
Total Suspended	mg/L	2	7	9	17.39	10	9	10.53	204	299	37.77	28	20	33.33	25	24	4.08	12	12	0	9	7	25
Vinyl Chloride	ug/L	0.2	<0.2	<0.2	N/A	<0.2	<0.2	N/A										<0.2	<0.2	NA			
Zn	mg/L	0.01	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	0.01	N/A	<0.01	<0.01	N/A	0.01	<0.01	N/A	<0.01	<0.01	NA	0.01	0.01	0
RPD - Relative Percent Difference						RPD >20%																	
RPD = abs (X1 - X2)/((X1 + X2)/2) * 100																							
X1 = Sample Parameter Value																							
X2 = Duplicate Parameter Value																							
BOLD or Red = SLR RPD Criteria Exceeded																							

1464898	**1464900**		**1471806**	**1471811**		**1475057**	**1475066**		**1480013**	**1480021**		**1485309**	**1485323**		**1487983**	**1487996**		**1492670**	**1492683**		**1493684**	**1493695**	
SWMC1	**DUP-1**		**SWMC3**	**DUP-1**		**SW1**	**DUP-1**		**SW1**	**DUP-1**		**SW1**	**DUP-1**		**SWMC1**	**DUP-1**		**SWMC5**	**DUP-1**		**SW1**	**DUP-1**	
2019-11-06	**2019-11-06**		**2019-12-11**	**2019-12-11**		**2020-01-10**	**2020-01-10**		**2020-02-14**	**2020-02-14**		**2020-03-17**	**2020-03-17**	**RPD**	**2020-04-07**	**2020-04-07**	**RPD**	**2020-05-08**	**2020-05-08**	**RPD**	**2020-05-14**	**2020-05-14**	**RPD**
		RPD			**RPD**			**RPD**			**RPD**												
						99	106	6.83							108	108	0						
						<0.4	<0.4	N/A							<0.4	<0.4	N/A						
						98	85	14.21					<0.0001	N/A	105	105	0						
<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	0.02	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001	#VAL U E!	<0.0001	<0.0001	N/A
0.04	0.03	28.57	0.05	0.05	0	0.06	0.17	95.65	0.01	0.1	163.64	0.02	164	5.92	0.01	0.01	0	0.12	0.07	52.63	0.16	0.16	0
216	206	4.74	222	216	2.74	246	247	0.41	193	185	4.23	174	<0.001	N/A	167	165	1.2	228	228	0	260	248	4.72
<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	0.09	10.53	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A
0.06	0.05	18.18	0.04	0.02	66.67	1.7	1.5	12.5	1.82	1.87	2.71	0.1	0.04	0	0.04	0.04	0	0.92	1	8.33	0.97	0.96	1.04
0.07	0.07	0	0.07	0.07	0	0.13	0.13	0	0.14	0.14	0	0.04			0.05	0.05	0	0.08	0.08	0	0.07	0.07	0
						<0.5	<0.5	N/A					69	1.44	<0.5	<0.5	N/A						
109	109	0	102	102	0	107	107	0	78	78	0	70	7	0	76	76	0	75	75	0	68	69	
<1	<1	NA	4	3	28.57	2	3	40	5	6	18.18	7	<0.0001	N/A	<1	<1	N/A	1	3	N/A	4	1	
<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	24	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A
21	22	4.65	26	26	0	194	200	3.05	212	192		24	0	22.22	20	20	0	137	136	0.73	134	138	2.94
0	0	0	0	0	0	0	0	0	0	0	6.45	0	30	35.62	0	0	66.67	0	0	0	0	0	0
30.5	30.5	31.58	13	13	0	76	76	0	72	72	0	43	507	0.2	49	32	41.98	69	71	2.86	63	71	11.94
683	685	0.29	631	628	0.48	1920	1930	0.52	1980	1990	0.5	508	0	0	491	495	0.81	1430	1410	1.41	1460	1460	0
<0.001	<0.001	NA	<0.001	<0.001	NA	0.01	0.01	33.33	0.01	0.01	0	0	0	0	0	0	66.67	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	66.67	0	0	0	0	0	0
						<4.0	<4.0	N/A					12.2	4.02	<4.0	<4.0	N/A						
12.3	12	2.47	8	8.1	1.24	26.4	27.1	2.62	29.2	30.5	4.36	12.7	0.55	10.34	12.7	12.2	4.02	26.7	26.6	0.38	27.3	26.7	2.22
0.36	0.35	2.82	0.22	0.21	4.65	0.54	0.52	3.77	0.36	0.4	10.53	0.61	Y	N/A	1.16	0.61	62.15	0.36	0.34	5.71	0.4	0.39	2.53
Y	Y	NA	Y	Y	NA	Y	Y	N/A	Y	Y	N/A	Y	209	1.43				Y	Y	N/A	Y	Y	N/A
338	334	1.19	308	308	0	415	415	0	347	347	0	212	<0.0001	N/A	231	227	1.75	303	303	0	269	267	0.75
<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	4	0	<0.0001	<0.0001	N/A	<0.0001	<0.0001		<0.0001	<0.0001	N/A
4	3	28.57	3	2	40	62	63	1.6	74	74	0	4	9	0	3	3	0	47	48	2.11	43	42	2.35
16	15	6.45	13	13	0	36	36	0	37	37	0	9	0.07	0	10	9	10.53	28	28	0	24	23	4.26
0.05	0.05	0	0.04	0.04	0	0.06	0.06	0	0.06	0.07	15.38	0.07			0.11	0.07	44.44	0.06	0.06	0	0.08	0.08	0
14	14	0	12	11	8.7	190	191	0.52	233	227	2.61		24	4.26	14	14	0	160	160	0	153	153	0
0.04	<0.010	NA	0.02	0.01	22.22	0.41	0.39	3.52	0.25	0.26	7.47	23	0.51	0.2	0.31	0.53	51.31	<0.010	0.1	N/A	0.04	<0.010	N/A
												0.51	<0.10	N/A	<0.10	<0.10	N/A	NC	0.01	N/A			
<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	5.85	9.87				<0.10	<0.10	N/A	<0.10	<0.10	N/A
8.89	8.6	3.32	4.75	4.7	1.06	76.8	77.1	0.39	93.4	93.5	0.11	5.3	0.22	0.93	3.55	3.55	0	45.1	47.6	5.39	46.5	42.3	9.46
0.04	0.04	8	0.03	0.03	0	0.11	0.1	6.57	0.08	0.09	8.19	0.21	<0.001	N/A	0.15	0.06	87.38	0.07	0.07	2.86	0.06	0.06	1.68
<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	8	0.63	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A
8.28	8.39	1.32	8.16	8.14	0.25	7.96	7.94	0.25	8.1	8.25	1.83	7.95	0	28.57	7.97	8.01	0.5	8.33	8.17	1.94	8.31	8.36	0.6
<0.001	<0.001	NA	<0.001	<0.001	NA	0.01	0	22.22	0	<0.001	N/A	0	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	0.01	0.01	57.14
<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	44	2.3	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A
87	87	0	75	75	0	111	115	3.54	93	94	1.07	43	330	0	44	44	0	98	98	0	103	106	2.87
444	445	0.22	410	408	0.49	1250	1250	0	1290	1290	0	330			319	322	0.94	930	916	1.52	949	949	0
						<0.5	<0.5	N/A							<0.5	<0.5	N/A						
						105	88	17.62					2.37	22.01	103	97	6						
1.05	1.17	10.81	0.7	0.7	0	3.5	3.7	5.56	3.76	3.82	1.58	1.9	0.15	16.25	2.66	2.86	7.25	3.08	3.22	4.44	3.46	5.23	40.74
0.02	0.02	5.41	0.02	0.02	5.71	0.04	0.48	167.47	0.03	0.04	13.7	0.13	22	0	0.01	0.01	12.31	0.03	0.02	11.76	0.03	0.03	9.23
14	15	6.9	5	5	0	21	17	21.05	16	19	17.14	22			88	40	75	20	24	18.18	44	21	70.77
						<0.2	<0.2	N/A					<0.01	#VALUE!	<0.2	<0.2	N/A						
<0.01	<0.01	NA	<0.01	<0.01	NA	0.02	0.02	0	0.02	0.02	0	<0.01			<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A

1507640	**1507653**		**1508116**	**1508128**		**1513025**	**1513036**		**1521861**	**1521864**		**1526417**	**1526425**		**1533866**	**1533879**		**1521861**	**1521864**			**1538394**	**1538406**
SWMC5	**DUP-1**		**SW1**	**DUP-1**		**SW1**	**DUP-1**		**SWFD4**	**DUP-1**		**SWMC2A**	**DUP-1**		**SW1**	**DUP-1**		**SWFD4**	**DUP-1**			**SW1**	**DUP 1**
2020-07-30	**2020-07-30**	**RPD**	**2020-08-04**	**2020-08-04**	**RPD**	**2020-08-26**	**2020-08-26**	**RPD**	**2020-10-13**	**2020-10-13**	**RPD**	**2020-11-03**	**2020-11-03**	**RPD**	**2020-12-09**	**2020-12-09**	**RPD**	**2020-10-13**	**2020-10-13**	**RPD**		**2021-01-14**	**2021-01-14**
106	105	0.95										87	86	1.2									
<0.4	<0.4	N/A										<0.4	<0.4	NA									
90	89	1.12										111	106	4.6									
<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA		<0.0001	<0.0001
0.45	0.37	19.51	0.21	0.19	10	0.09	0.13	36.36	0.07	<0.01	N/A	<0.01	<0.01	NA	0.04	0.04	0	0.07	<0.01	#VALUE!		0.07	0.08
184	183	0.54	224	225	0.45	242	234	3.36	192	191	0.52	234	236	0.9	237	250	5.34	192	191	0.52		187	191
0	0	0	0	0	0	0	0	0	<0.001	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001	<0.001	NA		<0.001	<0.001
0.56	0.57	1.77	0.59	0.6	1.68	0.85	0.86	1.17	0.02	0.02	0	0.09	0.05	57.1	0.68	0.63	7.63	0.02	0.02	0		1.1	1.1
0.08	0.08	0	0.07	0.07	0	0.08	0.08	0	0.07	0.07	0	0.06	0.06	0.0	0.09	0.1	10.53	0.07	0.07	0		0.13	0.13
<0.5	<0.5	N/A										<0.5	<0.5	NA			NA			NA			
71	73	2.78	92	92	0	81	81	0	82	81	1.23	103	106	2.9	116	116	0	82	81	1.23		96	94
6	11	58.82	4	3	28.57	5	5	0	6	7	15.38	4	3	28.6	4	4	0	6	7	15.38		4	2
<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA		<0.0001	<0.0001
94	94	0	78	77	1.29	102	121	17.04	24	24	0	25	<1	NA	140	144	2.82	24	24	0		164	158
0	0	0	0	0	9.52	0	0	8	<0.0002	<0.0002	N/A	0	0	0.0	0	0	0	<0.0002	<0.0002	NA		0.0014	0.0015
70	65	7.41	63	66	4.65	59	68	14.17	27	30	10.53	24	23	4.3	53	54	1.87	27	30	10.53		56	59
1050	1060	0.95	1080	1080	0	1290	1270	1.56	517	519	0.39	687	693	0.9	1430	1440	0.7	517	519	0.39		1670	1680
0	0	0	0	0	40	0	0	0	<0.001	<0.001	N/A	<0.001	<0.001	NA	0	0	0	<0.001	<0.001	NA		0.004	0.004
0.01	0.01	0	0	0	0	0	0	0	<0.001	<0.001	N/A	0	0	0.0	0	0	0	<0.001	<0.001	NA		0.002	0.002
<4.0	<4.0	N/A										<4.0	<4.0	NA			NA			NA			
25.5	24.5	4	25	24.9	0.4	22	23.4	6.17	11.7	11.7	0	10	10.4	3.9	18.9	18.5	2.14	11.7	11.7	0		24.6	24.3
1.41	1.43	1.41	0.67	0.6	11.02	0.63	0.64	1.57	0.32	0.36	11.76	0.34	0.34	0.0	0.29	0.34	15.87	0.32	0.36	11.76		0.61	0.65
Y	Y		Y	Y	N/A	Y	Y	N/A	Y	Y	N/A	Y	Y	NA	Y	Y	NA	Y	Y	NA		Y	Y
256	261	1.93	329	324	1.53	301	301	0	242	239	1.25	319	326	2.2	409	409	0	242	239	1.25		384	375
<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA		<0.0001	<0.0001
29	30	3.39	29	29	0	37	37	0	4	4	0	3	3	0.0	38	39	2.6	4	4	0		58	57
19	19	0	24	23	4.26	24	24	0	9	9	0	15	15	0.0	29	29	0	9	9	0		35	34
0.1	0.11	9.52	0.05	0.05	0	0.06	0.06	0	0.08	0.08	0	0.04	0.04	0.0	0.06	0.07	15.38	0.08	0.08	0		0.07	0.08
99	98	1.02	95	95	0	125	127	1.59	11	11	0	16	16	0.0	118	118	0	11	11	0		171	170
1.5	1.47	2.02	0.19	0.17	11.83	0.16	0.16	0	<0.010	<0.010	N/A	0.11	0.09	22.2	0.15	0.15	0.67	<0.010	<0.010	NA		0.206	0.213
												0	0	22.2	0	0	0.67	N/A	N/A	NA		0.00220279	0.00212714
0.13	0.14	7.41	<0.10	<0.10	N/A	0.16	0.17	6.06	<0.10	<0.10	N/A	<0.10	<0.10	NA	<0.10	<0.10	NA	<0.10	<0.10	NA		<0.10	<0.10
24.4	25.7	5.19	25.1	25.9	3.14	32.9	33.5	1.81	1.63	1.59	2.48	5.8	5.55	4.4	52.1	54.7	4.87	1.63	1.59	2.48		73.6	69.4
0.35	0.37	5.81	0.17	0.18	5.78	0.27	0.29	8.14	0.039	0.043	9.76	0.02	0.02	0.0	0.07	0.09	28.57	0.04	0.04	9.76		0.104	0.1
0	0	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001	<0.001	NA		<0.001	<0.001
7.92	7.94	0.25	7.97	8.01	0.5	8.09	8.11	0.25	8.07	8.12	0.62	8.24	8.24	0.0	8.27	8.26	0.12	8.07	8.12	0.62		8.12	8.09
0.01	0.01	28.57	0.01	0.01	0	0	0	28.57	0.007	0.006	15.38	<0.001	<0.001	NA	0	0	0	0.01	0.01	15.38		0.003	0.003
<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001		NA		<0.001	<0.001
102	102	0	114	119	4.29	121	122	0.82	36	36	0	83	83	0.0	125	129	3.15	36	36	0		107	101
682	689	1.02	702	702	0	838	826	1.44	336	337	0.3	447	450	0.7	930	936	0.64	336	337	0.3		1090	1090
<0.5	<0.5	N/A										<0.5	<0.5	NA			NA			NA			
103	101	1.96										90	94	4.4			NA			NA			
5.57	4.98	11.18	3.2	2.79	13.69	3.3	3.3	0	0.719	0.726	0.97	1	0.97	3.5	2.92	3.18	8.52	0.72	0.73	0.97		2.09	3.92
0.15	0.16	6.45	0.08	0.07	7.79	0.14	0.16	12.46	0.036	0.014	88	0.01	0.01	0.0	0.05	0.05	10.1	0.04	0.01	88		0.033	0.038
91	107	16.16	53	61	14.04	47	34	32.1	8	11	31.58	8	9	11.8	42	34	21.05	8	11	31.58		18	3
<0.2	<0.2	N/A										<0.2	<0.2	NA			NA						
0.01	0.01	0	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	NA	0.01	0.01	0	<0.01	<0.01	NA		0.01	0.01

	1543597	1543604		1548365	1548378		1553596	1553606		1557479	1557484		1565638	1565646		1569096	1569107		1587666	1587671		1593959	1593972
RPD	SW2	DUP-1		SW1	DUP-1		SWMC2A	Dup-1		SWMC2A	DUP-1		SWMC2A	Dup-1		SW2	Dup-1		SWFD3	Dup-1		SWMC5	DUP-1
RPD	2021-02-25	2021-02-25	RPD	2021-03-30	2021-03-30	RPD	2021-04-23	2021-04-23	RPD	2021-05-14	2021-05-14	RPD	2021-06-28	2021-06-28	RPD	2021-07-15	2021-07-15	RPD	2021-10-05	2021-10-05	RPD	2021-11-04	2021-11-04
RPD			RPD			RPD			RPD			RPD			RPD			RPD			RPD		
	128	124	3.17460317							122	123											112	88
	<0.4	<0.4	N/A							<0.4	<0.4	N/A										<0.4	<0.4
	86	82	4.76190476							81	83											71	85
N/A	<0.0002	<0.0002	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001
13.3333333	0.38	0.34	11.1111111	0.04	0.05	22.2222222	0.07	0.06	15.3846154	0.03	0.03	2.43902439	0.03	0.04	28.5714286	0.1	0.11	9.52380952	<0.01	<0.01		0.04	0.03
2.11640212	206	206	0	185	187	1.07526882	165	169	2.39520958	193	193	N/A	231	232	0.43196544	228	229	0.43763676	173	174		255	258
N/A	0.002	0.002	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	0	<0.001	<0.001	N/A	0.002	0.002	0	0.001	0.001	N/A	<0.001	<0.001
0	3.8	3.8	0	0.3	0.3	0	0.05	0.05	0	0.04	0.04	0	0.05	0.05	0	1.6	1.6	0	0.06	0.06	0.57636888	0.72	0.76
0	0.23	0.23	0	0.05	0.05	0	0.05	0.05	0	0.05	0.05	0	0.09	0.08	11.7647059	0.09	0.09	0	0.05	0.05	0	0.09	0.09
	<0.5	<0.5	N/A							<0.5	<0.5	N/A										<0.5	<0.5
2.10526316	63	62	1.6	80	79	1.25786164	70	73	4.1958042	95	93	2.12765957	108	108	0	84	85	1.18343195	83	87	4.70588235	125	123
66.6666667	2	2	0	2	1	66.6666667	2	<1	N/A	3	3	0	2	2	0	<1	<1	N/A	2	3	40	<1	<1
N/A	<0.0002	<0.0002	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001
3.72670807	557	572	2.65721878	63	62	1.6	43	42	2.35294118	18	20	10.5263158	22	20	9.52380952	168	179	6.34005764	40	41	2.4691358	110	110
6.89655172	0.0038	0.0044	0.38	0.0006	0.0006	0	<0.0002	0.0002	N/A	0.0002	0.0002	0	0.0002	0.0002	0	0.002	0.0021	4.87804878	<0.0002	<0.0002	N/A	0.0012	0.0012
5.2173913	144	137	4.98220641	48	51	6.06060606	32	36	11.7647059	38	31	20.2898551	21	19	10	75	79	5.19480519	40	37	7.79220779	23	37
0.59701493	4210	4240	0.71005917	829	843	1.67464115	601	613	1.97693575	496	495	0.20181635	633	639	0.94339623	1750	1760	0.56980057	603	605	0.33112583	1390	1420
0	0.011	0.013	N/A	0.001	0.001	0	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	0.004	0.004	0	<0.001	<0.001	N/A	0.003	0.003
0	0.001	<0.002	N/A	0.002	0.002	0	0.002	0.002	0	0.002	0.002	0	0.002	0.002	0	0.004	0.004	0	0.002	0.002	0	0.002	0.002
	<4.0	<4.0	N/A							<4.0	<4.0	N/A										<4.0	<4.0
1.22699387	52	53	1.9047619	19.8	19.2	3.07692308	12.6	12.4	1.6	18.2	18.1	0.55096419	9.9	9.8	1.01522843	27.1	27.7	2.18978102	18	18	0	20.3	20.2
6.34920635	0.23	0.21	N/A	0.46	0.48	4.25531915	0.25	0.29	14.8148148	0.4	0.39	2.53164557	0.23	0.26	12.244898	0.46	0.62	29.6296296	0.1	0.1	0	0.33	0.3
N/A	Y	Y	N/A	Y	Y	N/A	Y	Y	N/A	Y	Y	N/A	Y	Y	N/A	y	y	N/A	y	y	N/A	y	y
2.3715415	483	480	0.62305296	266	263	1.1342155	216	228	5.40540541	287	282	1.75746924	344	344	0	342	344	0.58309038	253	267	5.38461538	436	431
N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001	N/A	<0.0001	<0.0001
1.73913043	195	196	0.51150895	16	16	0	4	4	0	2	2	0	3	4	28.5714286	56	56	0	6	6	0	36	35
2.89855072	79	79	0	16	16	0	10	11	9.52380952	12	12	0	18	18	0	32	32	0	11	12	8.69565217	30	30
13.3333333	0.03	0.02	N/A	0.05	0.05	0	0.05	0.05	0	0.08	0.08	0	0.02	0.02	0	0.02	0.02	0	0.01	0.01	0	0.03	0.03
0.58651026	685	671	2.06489676	62	61	1.62601626	29	28	3.50877193	16	16	0	14	14	0	192	194	1.03626943	22	23	4.44444444	127	125
3.34128878	4.76	5.38	N/A	0.781	0.773	1.02960103	2.52	2.5	0.79681275	0.032	0.868	185.777778	<0.010	<0.010	N/A	0.221	0.248	11.5138593	<0.010	<0.010	N/A	0.095	0.081
3.49440229	0.00992551	0.01121833	12.2287968	0.00014663	0.00014513	1.02960103	0.0052	0.0052	0	0.00402484	0.10917387	185.777778	NC	NC	N/A	0.00902156	0.01012374	11.5138593	NC	NC	N/A	0.0025963	0.00221369
N/A	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<0.10	N/A	<0.10	<1.0	N/A	<0.10	<0.10	N/A	<0.50	<0.50	N/A	<0.10	<0.10	N/A	<0.10	<0.50
5.87412587	218	219	0.4576659	20.7	20.7	0	2.51	2.52	0.39761431	1.76	1.8	2.24719101	4.94	4.86	1.63265306	68	68.9	1.31482834	2.32	2.36	1.70940171	43	44.8
3.92156863	0.247	0.219	12.0171674	0.151	0.152	0.66006601	0.042	0.038	10	0.033	0.035	5.88235294	0.037	0.033	11.4285714	0.143	0.143	0	0.413	0.412	0.24242424	0.084	0.087
N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001
0.37014189	7.92	7.91	0.12634239	7.72	7.78	0.77419355	8.11	8.09	0.24691358	8.19	8.2	0.12202563	8.1	8.08	0.24721879	7.78	7.8	0.25673941	8	8.04	0.49875312	7.95	8.01
0	0.006	0.003	66.6666667	0.004	0.002	66.6666667	<0.0010	<0.0010	N/A	<0.0010	<0.0010	N/A	<0.001	<0.001	N/A	0.005	0.006	18.1818182	0.002	0.003	40	0.002	0.001
N/A	<0.002	<0.002	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001	N/A	<0.001	<0.001
5.76923077	260	268	3.03030303	70	70	0	65	66	1.52671756	45	40	11.7647059	84	84	0	127	135	6.10687023	63	64	1.57480315	110	112
0	2740	2760	0.72727273	539	548	1.65593376	391	398	1.77	322	322	0	411	415	0.968523	1140	1140	0	392	393	0.25477707	904	923
	<0.5	<0.5	N/A							<0.5	<0.5	N/A										<0.5	<0.5
	99	102	2.98507463							108	109	0.92165899										109	83
60.8985025	14.9	15.4	3.30033003	2.58	2.72	5.28301887	4.08	4.36	6.64	1.14	0.913	22.1139795	1.03	1.25	19.2982456	3.11	2.8	10.4906937	1.26	1.67	27.9863481	2.62	2.5
14.084507	0.101	0.101	0	0.135	0.129	4.54545455	0.016	0.017	6.06060606	0.014	0.013	7.40740741	0.016	0.016	0	0.102	0.106	3.84615385	0.413	0.402	2.6993865	0.066	0.057
142.857143	18	34	61.5384615	40	38	5.12820513	15	13	14.29	17	20	16.2162162	9	9	0	24	29	18.8679245	3	2	40	13	7
	<0.2	<0.2	N/A							<0.2	<0.2	N/A										<0.2	<0.2
0	0.02	0.03	40	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01	N/A	<0.01	<0.01

	1599816	**1599827**	
	SWMC1	**DUP-1**	
RPD	**2021-12-03**	**2021-12-03**	**RPD**
RPD			**RPD**
24			
N/A			
17.9487179			
N/A	<0.0001	<0.0001	N/A
28.5714286	<0.01	<0.01	N/A
1.16959064	234	234	0
N/A	<0.001	<0.001	
5.40540541	0.06	0.05	18.1818182
0	0.07	0.08	13.3333333
N/A			
1.61290323	118	118	0
N/A	1	2	66.6666667
N/A	<0.0001	<0.0001	N/A
0	29	30	3.38983051
0	0.0005	0.0009	57.1428571
46.6666667	33	51	42.8571429
2.13523132	730	727	0.41180508
0	0.001	0.002	66.6666667
0	0.002	0.003	40
N/A			
0.49382716	8.8	8.7	1.14285714
9.52380952	0.64	1.22	62.3655914
	Y	Y	N/A
1.15340254	369	369	0
	<0.0001	<0.0001	N/A
2.81690141	4	4	0
0	18	18	0
0	0.06	0.1	50
1.58730159	19	19	0
15.9090909	0.064	0.075	15.8273381
15.9090909	0.00058587	0.00088214	40.3636125
N/A	<0.10	<0.10	N/A
4.10022779	9.13	9.46	3.55029586
3.50877193	0.039	0.074	61.9469027
	<0.001	<0.001	N/A
0.7518797	7.99	8.1	1.36730889
66.6666667	0.001	<0.001	N/A
	<0.001	<0.001	N/A
1.8018018	82	83	1.21212121
2.07991242	474	473	0.21119324
N/A			
27.0833333			
4.6875	1.08	0.977	10.0145843
14.6341463	0.011	0.021	62.5
60	42	92	74.6268657
N/A			
N/A	<0.01	<0.01	N/A

Appendix D

Water Quality Data and Summary Statistics for all Water Quality Variables for May 32, 2019 to December 3, 2021

Sampling Station SW1											Est'd.	Est'd.	Est'd.	Est'd.	
		measured / estimated flow					609.00	304.00	21.00	52.00	36.00	38.00	30.00	39.00	61.00
		effluent discharge (L/sec)					50.00	50.00	0.00	0.00	20.00	20.00	20.00	20.00	20.00
			mg/L				SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
	LAB ID:						1428321.00	1431594.00			B19-26597-4	B19-27095-1	B19-27537-1	B19-27824-1	
				PWQO (APV	CCME Surface	Environment BC	2019-05-23	2019-06-06	2019-7-10	2019-8-8	2019-8-23	2019-8-27	2019-8-30	2019-9-3	2019-9-4
Analyte	PWQO	MRL	Effluent Limit												
1,2-dichloroethane-d4 (%)							95.00	100.00							
1,4-dichlorobenzene (µg/L)				4.00			<0.4	<0.4			< 0.5	< 0.5	< 0.5	< 0.5	
4-bromofluorobenzene (%)							115	116							
Ag (mg/L)							<0.0001	<0.0001							
Al (dissolved) (mg/L)	0.075*	0.01					0.04	0.04							
Alkalinity as CaCO3 (mg/L)		5					223	208			241	256	190	192	
As (mg/L)	0.1	0.001					<0.001	<0.001							
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.56	0.96			2.61	3.09	0.38	0.537	
Ba (mg/L)		0.01					0.07	0.1			0.13	0.125	0.067	0.069	
Benzene (µg/L)				100.00	ND/370	ND/40	<0.5	<0.5			< 0.5	< 0.5	< 0.5	< 0.5	
Ca (mg/L)		1					85	84			90.1	76.4	63.2	69.9	
CBOD5 (mg/L)		1	10.0				4	2			< 3	< 3	< 3	< 3	
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	<0.0001	<0.0001			< 0.000070	< 0.000070	< 0.000070	< 0.000070	
Cl (mg/L)		1			640/120	600/150	77	133			375	371	71	101	
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0009	0.0013							
COD (mg/L)		5					45	58			113	115	62	59	
Conductivity (µmho/cm)		5					900	1430			3010	3300	760	1010	
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.003	0.003			0.006	0.005	0.004	0.003	
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002			0.0033	0.0054	0.0038	0.0032	
Dichloromethane (µg/L)				100.00	ND/9811		<4.0	<4.0			< 5	< 5	< 5	< 5	
DOC (mg/L)		0.50					19.9	24.1			20.7	33.8	18.4	17.6	
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.37	0.28			0.957	0.825	1.63	1.63	
Filtration							Y	Y							
Hardness as CaCO3 (mg/L)		1					290	321			449	457	237	262	
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	<0.0001	<0.0001			< 0.00002	< 0.00002	< 0.00002	< 0.00002	
K (mg/L)		1					25	48			122	142	18.3	26.5	
Mg (mg/L)		1					19	27			54.5	64.8	19.2	21.3	
Mn (mg/L)		0.01					0.05	0.07			0.085	0.061	0.089	0.092	
Na (mg/L)		2		180.00			82	152			436	476	69.6	88.4	
N-NH3 (mg/L)		0.02	1.0				0.25	0.087			0.32	0.21	0.16	0.19	
N-NH3 (Unionized - calcula	0.02			0.0200											
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	<0.10			<0.1	< 1	< 0.1	< 0.1	
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	18.7	35.7			124	102	12.7	20.9	
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.087	0.072			0.16	0.14	0.15	0.16	
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001			0.0003	0.0003	0.002	0.0005	
pH	6.5-8.5						8.16	8.25							
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001			<0.002	< 0.002	< 0.002	< 0.002	
Se (mg/L)	0.1	0.001					<0.001	<0.001							
SO4 (mg/L)		1				429.00	70	122			343	321	69	90	
TDS (COND - CALC) (mg/L)		5					585	930			2114	2056	483	607	
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	<0.5	<0.5			< 0.5	< 0.5	< 0.5	< 0.5	
Toluene-d8 (%)	0.0001	0.0001					100	103							
Total Kjeldahl Nitrogen (mg/L)		0.10					2	1.65			4.5	4.7	2.1	2.4	
Total P - Soluble (mg/L)							0.05	0.0498							
Total Suspended Solids (mg/L)		2	10.0				10	11			28	31	30	34	
Vinyl Chloride (µg/L)				600.00			<0.2	<0.2			< 0.2	< 0.2	< 0.2	< 0.2	
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.03	0.01	Field Measure	Field Measure	0.023	0.02	0.008	0.017	Field Measure
Field Data															
Temperature (C)							12.5	21.5	25.7	24.1					19.9
pH	6.5-8.5						7.03	8.37	7.92	7.95					8.38
Conductivity (µmho/cm)							806	1533	480	523					1095
Dissolved Oxygen (mg/L)			4.00				10.56	15.07	7.1	6.1					7.46

Sampling Station SW1							Est'd.	Est'd.							
		measured / estimated flow					63.00	57.00	29.00	52.00	589.00	115.00	226.00	716.00	364.00
		effluent discharge (L/sec)					20.00	20.00	0.00	10.00	10.00	10.00	10.00	10.00	10.00
			mg/L				SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1	SW1
	LAB ID:						B19-28281-1	B19-28725-1	1459465.00	B19-33323-1	B19-33766-1	B19-34301-1	B19-34716-1	B19-35135-1	B19-35418-1
				PWQO (APV	CCME Surface	Environment BC	2019-9-6	2019-9-10	2019-10-10	2019-10-15	2019-10-18	2019-10-22	2019-10-25	2019-10-29	2019-10-31
Analyte	PWQO	MRL	Effluent Limit												
1,2-dichloroethane-d4 (%)									98.70						
1,4-dichlorobenzene (µg/L)				4.00			< 0.5	< 0.5	<0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
4-bromofluorobenzene (%)									98						
Ag (mg/L)									<0.0001						
Al (dissolved) (mg/L)	0.075*	0.01							<0.01						
Alkalinity as CaCO3 (mg/L)		5					263	301	204	267	148	203	196	177	194
As (mg/L)	0.1	0.001							<0.001						
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	1.02	2.39	0.08	1.61	0.165	0.459	0.325	0.125	0.184
Ba (mg/L)		0.01					0.062	0.091	0.06	0.091	0.085	0.078	0.095	0.087	0.085
Benzene (µg/L)				100.00	ND/370	ND/40	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ca (mg/L)		1					54.9	76.1	79	78.5	99	84.7	110	107	101
CBOD5 (mg/L)		1	10.0				< 3	< 3	2	< 3	< 3	< 3	< 3	< 3	< 3
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	< 0.000070	< 0.000070	<0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Cl (mg/L)		1			640/120	600/150	168	481	23	246	39.9	86.1	64.9	39.9	40.7
Co (mg/L)	0.0009	0.0002				0.110/0.004			0.0012						
COD (mg/L)		5					55	< 5	27	26	51	46	63	48	47
Conductivity (µmho/cm)		5					1400	2900	532	2130	751	1100	973	754	797
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.003	0.008	0.004	0.005	0.003	0.003	0.003	0.001	0.002
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.0036	0.0068	0.004	0.0025	0.0038	0.003	0.0031	0.0037	0.0055
Dichloromethane (µg/L)				100.00	ND/9811		< 0.5	< 5	<4.0	< 5	< 5	< 5	< 5	< 5	< 5
DOC (mg/L)		0.50					14.4	33.3	12.9	18.7	16.6	16	15.7	14.4	14.4
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	1.21	1.05	2	1.27	1.18	1.01	0.996	0.667	0.747
Filtration									Y						
Hardness as CaCO3 (mg/L)		1					252	412	255	373	321	303	366	340	326
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	< 0.00002	< 0.00002	<0.0001	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	0.00003
K (mg/L)		1					44.1	120	5	81.9	12.4	26.2	19.4	9.6	10.1
Mg (mg/L)		1					27.8	54	14	42.9	17.8	22.3	22.2	17.7	18
Mn (mg/L)		0.01					0.063	0.047	0.12	0.064	0.083	0.048	0.047	0.044	0.037
Na (mg/L)		2		180.00			176	377	22	261	32.7	83.4	60.8	30	35
N-NH3 (mg/L)		0.02	1.0				0.11	0.13	0.099	0.17	0.17	0.2	0.17	0.17	0.2
N-NH3 (Unionized - calcula	0.02			0.0200					0.003390825	0.0023	0.0003	0.0018	0.0012	0.0001	0.0002
N-NO2 (mg/L)		0.10				0.6/0.2	< 0.1	< 0.1	<0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	29.8	74.5	1.2	58.9	17.6	28.2	19.8	13.4	11
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.11	0.15	0.113	0.06	0.11	0.09	0.06	0.07	0.07
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	0.0004	0.0009	<0.001	0.0004	0.0005	0.0003	0.0003	0.0003	0.0003
pH	6.5-8.5								8.43						
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	< 0.002	< 0.002	<0.001	0.003	< 0.002	< 0.002	< 0.002	0.001	< 0.002
Se (mg/L)	0.1	0.001							<0.001						
SO4 (mg/L)		1				429.00	128	257	45	154	112	113	114	102	111
TDS (COND - CALC) (mg/L)		5					890	1876	346	1287	482	664	599	472	482
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene-d8 (%)	0.0001	0.0001							92						
Total Kjeldahl Nitrogen (mg/L)		0.10					2.6	4.9	1.1	3.8	1.9	2.4	2	1.7	1.6
Total P - Soluble (mg/L)									0.033						
Total Suspended Solids (mg/L)		2	10.0				38	36	65	33	32	20	3	10	18
Vinyl Chloride (µg/L)				600.00			< 0.2	< 0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.022	0.056		0.026	0.011	0.009	0.012	0.013	0.01
Field Data															
Temperature (C)									9.6			9.9	8.2	10.9	12.7
pH	6.5-8.5								8.3	8.2	8.8	7.69	7.65	6.52	6.65
Conductivity (µmho/cm)									514	7.86	6.98				
Dissolved Oxygen (mg/L)			4.00						10.53						

Sampling Station SW1														
		measured / estimated flow					985.00	339.00	44.00	10.00	189.60	1408.00	262.90	190.10	301.60
		effluent discharge (L/sec)					50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
			mg/L				SW1	SW1	1475057.00	1480013.00	1485309.00	1487982.00	1492671.00	1493684.00	1507641.00
	LAB ID:						1464899.00	1471804.00	SW1	SW1	SW1	SW1	SW1	SW1	SW1
				PWQO (APV	CCME Surface	Environment BC	2019-11-06	2019-12-11	2020-01-10	2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30
Analyte	PWQO	MRL	Effluent Limit												
1,2-dichloroethane-d4 (%)									99.00			111.00			103.00
1,4-dichlorobenzene (µg/L)				4.00					<0.4			<0.4			<0.4
4-bromofluorobenzene (%)									98			105			90
Ag (mg/L)							<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01					0.04	0.08	0.06	0.01	0.02	0.02	0.09	0.16	0.39
Alkalinity as CaCO3 (mg/L)		5					215	223	246	193	174	182	227	260	131
As (mg/L)	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.32	0.93	1.7	1.82	0.1	0.21	0.92	0.97	0.75
Ba (mg/L)		0.01					0.08	0.1	0.13	0.14	0.04	0.05	0.08	0.07	0.07
Benzene (µg/L)				100.00	ND/370	ND/40			<0.5			<0.5			<0.5
Ca (mg/L)		1					111	94	107	78	70	76	74	68	69
CBOD5 (mg/L)		1	10.0				<1	3	2	5	7	1	1	4	6
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		1			640/120	600/150	59	137	194	212	24	42	137	134	96
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0006	0.0012	0.0017	0.0015	0.0005	0.0005	0.0013	0.0015	0.0015
COD (mg/L)		5					35	46	76	72	43	46	68	63	74
Conductivity (µmho/cm)		5					967	1460	1920	1980	508	657	1420	1460	1140
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.001	0.004	0.007	0.005	0.001	0.001	0.003	0.003	0.003
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.004
Dichloromethane (µg/L)				100.00	ND/9811				<4.0			<4.0			<4.0
DOC (mg/L)		0.50					15.7	22.6	26.4	29.2	12.7	14.7	26.9	27.3	27.5
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.32	0.43	0.54	0.36	0.61	0.51	0.38	0.4	0.98
Filtration							Y	Y	Y	Y	Y		Y	Y	Y
Hardness as CaCO3 (mg/L)		1					360	350	415	347	212	243	300	269	255
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		1					15	43	62	74	4	9	48	43	35
Mg (mg/L)		1					20	28	36	37	9	13	28	24	20
Mn (mg/L)		0.01					0.04	0.06	0.06	0.06	0.07	0.06	0.07	0.08	0.07
Na (mg/L)		2		180.00			54	133	190	233	23	38	159	153	110
N-NH3 (mg/L)		0.02	1.0				0.035	0.31	0.405	0.245	0.513	0.087	0.01	0.036	0.714
N-NH3 (Unionized - calcula	0.02			0.0200			0.000634283	0.002724751	0.031774879	0.002712954	0.004706766	0.00001	0.000298602	7.37554E-05	0.00365947
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.17
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	20.2	50.4	76.8	93.4	5.3	13	45.7	46.5	32.6
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.066	0.155	0.11	0.082	0.213	0.073	0.071	0.06	0.235
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH	6.5-8.5						8.34	8.03	7.96	8.1	7.95	7.8	8.29	8.31	7.31
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001	0.005	0.004	0.003	<0.001	0.005	0.005	0.002
Se (mg/L)	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		1				429.00	104	115	111	93	43	56	101	103	142
TDS (COND - CALC) (mg/L)		5					629	949	1250	1290	330	427	923	949	741
Toluene (µg/L)				0.80	ND/.002	ND/0.0005			<0.5			<0.5			<0.5
Toluene-d8 (%)	0.0001	0.0001							105			100			103
Total Kjeldahl Nitrogen (mg/L)		0.10					1.25	2.2	3.5	3.76	1.9	2.5	3.44	3.46	3.9
Total P - Soluble (mg/L)							0.042	0.083	0.0424	0.034	0.13	0.0246	0.022	0.034	0.07
Total Suspended Solids (mg/L)		2	10.0				16	20	21	16	22	15	35	44	53
Vinyl Chloride (µg/L)				600.00					<0.2			<0.2			<0.2
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data															
Temperature (C)							6.6	0.21	0	-0.3	1	4.8	8.1	8.8	21.24
pH	6.5-8.5						8.12	8.03	9.02	8.15	8.02	6.05	8.29	7.09	7.08
Conductivity (µmho/cm)							938	1481	43	60	489	652	1409	1402	1070
Dissolved Oxygen (mg/L)			4.00				11.57	frozen meter	9.94	13.05	11.67	15	10.46	12.33	6.5

Sampling Station SW1														
		measured / estimated flow					512.70	118.40	93.88	316.81	479.70	NA [7]	NA	236.00	509.00
		effluent discharge (L/sec)					50.00	12.00	12.00	50.00	50.00	50.00	50.00	50.00	50.00
			mg/L				1508116.00	1513025.00	1521854.00	1526414.00	1533866.00	1538394	1543595.00	1548365.00	1553593.00
	LAB ID:						SW1	SW1	SWMC1	SW1	SW1	SW1	SW1	SW1	SW1
				PWQO (APV	CCME Surface	Environment BC	2020-08-04	2020-8-26	2020-10-13	2020-11-03	2020-12-09	2021-01-14	2021-02-25	2021-03-30	2021-04-23
Analyte	PWQO	MRL	Effluent Limit												
1,2-dichloroethane-d4 (%)										140.00			128.00		
1,4-dichlorobenzene (µg/L)				4.00						<0.4			<0.4		
4-bromofluorobenzene (%)										104			82		
Ag (mg/L)							<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	0.075*	0.01					0.21	0.09	0.41	0.03	0.04	0.07	0.1	0.04	0.07
Alkalinity as CaCO3 (mg/L)		5					224	242	239	275	237	187	231	185	179
As (mg/L)	0.1	0.001					0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.59	0.85	0.1	0.75	0.68	1.1	0.99	0.3	0.06
Ba (mg/L)		0.01					0.07	0.08	0.07	0.08	0.09	0.13	0.12	0.05	0.05
Benzene (µg/L)				100.00	ND/370	ND/40				<0.5			<0.5		
Ca (mg/L)		1					92	81	92	105	116	96	90	80	72
CBOD5 (mg/L)		1	10.0				4	5	7	3	4	4	2	2	<1
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		1			640/120	600/150	78	102	20	111	140	164	196	63	41
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0011	0.0012	0.0005	0.0012	0.0011	0.0014	0.0012	0.0006	0.0002
COD (mg/L)		5					63	59	27	44	53	56	65	48	36
Conductivity (µmho/cm)		5					1080	1290	634	1390	1430	1670	1700	829	615
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.003	0.003	0.002	0.002	0.003	0.004	0.004	0.001	<0.001
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Dichloromethane (µg/L)				100.00	ND/9811					<4.0			<4.0		
DOC (mg/L)		0.50					25	22	11.1	18.3	18.9	24.6	22.6	19.8	13.7
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.67	0.63	0.85	0.31	0.29	0.61	0.35	0.46	0.33
Filtration							Y	Y	Y	Y	Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		1					329	301	291	369	409	384	365	266	225
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		1					29	37	4	36	38	58	56	16	4
Mg (mg/L)		1					24	24	15	26	29	35	34	16	11
Mn (mg/L)		0.01					0.05	0.06	0.11	0.04	0.06	0.07	0.06	0.05	0.05
Na (mg/L)		2		180.00			95	125	19	128	118	171	187	62	28
N-NH3 (mg/L)		0.02	1.0				0.188	0.16	0.024	0.157	0.15	0.206	1.4	0.781	1.96
N-NH3 (Unionized - calcula	0.02			0.0200			0.042045791	0.00049756	0.002353793	0.00015561	4.53993E-05	0.002202789	0.001091017	0.000146631	0.00128429
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	0.16	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	25.1	32.9	0.86	44.5	52.1	73.6	69.4	20.7	2.54
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.168	0.271	0.084	0.073	0.066	0.104	0.107	0.151	<0.001
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	8.03
pH	6.5-8.5						7.97	8.09	8.14	8.19	8.27	8.12	8.18	7.72	<0.0010
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.006	0.003	0.004	<0.001	0.002	0.003	0.002	0.004	<0.001
Se (mg/L)	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	65
SO4 (mg/L)		1				429.00	114	121	70	110	125	107	117	70	0.033
TDS (COND - CALC) (mg/L)		5					702	838	412	904	930	1090	1100	539	400
Toluene (µg/L)				0.80	ND/.002	ND/0.0005				<0.5			<0.5		
Toluene-d8 (%)	0.0001	0.0001								101			99		
Total Kjeldahl Nitrogen (mg/L)		0.10					3.2	3.3	0.964	2.27	2.92	2.09	4.99	2.58	3.55
Total P - Soluble (mg/L)							0.08	0.143	0.085	0.044	0.052	0.033	0.033	0.135	0.079
Total Suspended Solids (mg/L)		2	10.0				53	47	51	18	42	18	30	40	24
Vinyl Chloride (µg/L)				600.00						<0.2			<0.2		
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	<0.01	<0.01
Field Data															
Temperature (C)							19.9	15.4	9.6	1.55	0.3	0.01	0.6	2.3	3.5
pH	6.5-8.5						8.87	7.05	8.56	7.03	6.56	NA [7]	6.96	6.28	6.78
Conductivity (µmho/cm)							1013	1228	1318	1246	1313	NA [7]	1461	766	551
Dissolved Oxygen (mg/L)			4.00				4.1	6.59	8.47	10.27	13.45	14.09	12.33	11.72	13.94

Sampling Station SW1													SW1: Statist	
		measured / estimated flow					296.00	195.00	827.00	313.00	600.00	723.00		Ma
		effluent discharge (L/sec)					50.00	38.00	50.00	50.00	15.00	50.00		
			mg/L				1557481.00	1565635.00	1569094.00	1587661	1593963	1599815.00	CM - EB	
	LAB ID:						SW1	SW1	SW1	SW1	SW1	SW1		
				PWQO (APV	CCME Surface	Environment BC	2021-05-14	2021-06-28	2021-07-15	2021-10-05	2021-11-04	2021-12-03		
Analyte	PWQO	MRL	Effluent Limit										MEAN	Standard Deviation
1,2-dichloroethane-d4 (%)							117.00				116		110.77	14.63
1,4-dichlorobenzene (µg/L)				4.00			<0.4				<0.4		#DIV/0!	#DIV/0!
4-bromofluorobenzene (%)							80				78		96.60	13.83
Ag (mg/L)							<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!
Al (dissolved) (mg/L)	0.075*	0.01					0.15	0.04	0.08	0.01	0.05	0.01	0.09	0.10
Alkalinity as CaCO3 (mg/L)		5					235	281	227	266	265	233	221.03	37.75
As (mg/L)	0.1	0.001					0.001	0.001	0.001	0.001	<0.001	<0.001	0.00	0.00
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	1.4	0.82	0.78	1.3	1.07	0.16	0.850	0.719
Ba (mg/L)		0.01					0.11	0.11	0.08	0.1	0.1	0.06	0.09	0.02
Benzene (µg/L)				100.00	ND/370	ND/40	<0.5				<0.5		#DIV/0!	#DIV/0!
Ca (mg/L)		1					93	110	88	105	126	114	88.87	16.66
CBOD5 (mg/L)		1	10.0				2	5	2	3	<1	<1	3.48	1.75
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!
Cl (mg/L)		1			640/120	600/150	180	120	97	130	150	44	127.91	100.86
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0021	0.0012	0.0011	0.0017	0.0018	0.0006	0.0011	0.0005
COD (mg/L)		5					79	40	59	51	50	45	55.61	19.11
Conductivity (µmho/cm)		5					1850	1370	1180	1610	1760	820	1345.82	662.88
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.005	0.003	0.003	0.003	0.004	0.002	0.003	0.002
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002	0.004	0.003	0.003	0.003	0.0030	0.0011
Dichloromethane (µg/L)				100.00	ND/9811		<4.0				<4.0		#DIV/0!	#DIV/0!
DOC (mg/L)		0.50					36	16.1	20.5	23.2	25	11.9	20.58	6.31
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.36	0.24	0.51	0.42	0.45	0.63	0.704	0.422
Filtration							Y	Y	y	Y	y	Y	#DIV/0!	#DIV/0!
Hardness as CaCO3 (mg/L)		1					380	411	319	390	471	367	333.13	67.15
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00003	0.00001
K (mg/L)		1					72	38	29	46	55	9	40.27	33.07
Mg (mg/L)		1					36	33	24	31	38	20	27.01	12.11
Mn (mg/L)		0.01					0.05	0.02	0.05	0.02	0.03	0.05	0.06	0.02
Na (mg/L)		2		180.00			244	136	106	144	187	38	134.95	108.68
N-NH3 (mg/L)		0.02	1.0				0.039	0.033	0.159	0.072	0.073	0.112	0.269	0.377
N-NH3 (Unionized - calcula	0.02			0.0200			0.003000785	0.000308371	0.007254727	0.001444598	0.000440745	0.000892279	0.0038	0.0091
N-NO2 (mg/L)		0.10				0.6/0.2	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	0.17	0.01
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	86.6	46.1	38.7	53.6	62	13.1	40.36	30.06
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.094	0.095	0.112	0.142	0.128	0.103	0.115	0.050
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.6182	2.2270
pH	6.5-8.5						8.14	7.99	7.73	8.11	7.92	7.94	8.06	0.24
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.010	<0.001	0.003	0.004	<0.001	0.001	0.0033	0.0014
Se (mg/L)	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	65.00	#DIV/0!
SO4 (mg/L)		1				429.00	100	90	97	104	120	89	114.18	64.07
TDS (COND - CALC) (mg/L)		5					1200	890	767	1050	1140	533	868.10	435.50
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	<0.5				<0.5		#DIV/0!	#DIV/0!
Toluene-d8 (%)	0.0001	0.0001					112				118		103.30	7.21
Total Kjeldahl Nitrogen (mg/L)		0.10					3.75	2.41	2.48	2.68	3.78	1.39	2.76	1.06
Total P - Soluble (mg/L)							0.064	0.063	0.068	0.109	0.098	0.068	0.07	0.03
Total Suspended Solids (mg/L)		2	10.0				18	6	40	16	22	52	28.67	14.89
Vinyl Chloride (µg/L)				600.00			<0.2				<0.2		#DIV/0!	#DIV/0!
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.01
Field Data														
Temperature (C)							12.59	22.6	19.9	14.1	5.1	1.5	9.84	8.17
pH	6.5-8.5						8.57	7.3	8.09	7.91	7.69	---[2]	7.68	0.79
Conductivity (µmho/cm)							1790	1350	1169	1621	1764	---[2]	969.99	534.47
Dissolved Oxygen (mg/L)			4.00				9.7	8.96	6.1	9.86	12.14	13.14	10.42	2.93

Sampling Station SW1							ics - Upgraded Treated Leachate Period 2					
		measured / estimated flow					y 23, 2019 to December 3, 2021					
		effluent discharge (L/sec)					23/5/2019 - 3/12/2021)					
			mg/L									
	LAB ID:											
				PWQO (APV	CCME Surface	Environment BC						
Analyte	PWQO	MRL	Effluent Limit				+ve SD	-ve SD	Grp D Median	Grp D 90th %	Count	Count > Objective
1,2-dichloroethane-d4 (%)							125.40	96.14	107.00	129.20	10.00	
1,4-dichlorobenzene (µg/L)				4.00			#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
4-bromofluorobenzene (%)							110.43	82.77	98.00	115.10	10.00	
Ag (mg/L)							#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Al (dissolved) (mg/L)	0.075*	0.01					0.19	-0.01	0.06	0.19	26.00	
Alkalinity as CaCO3 (mg/L)		5					258.77	183.28	224.00	266.20	39.00	
As (mg/L)	0.1	0.001					0.00	0.00	0.00	0.00	7.00	
B (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	1.569	0.132	0.750	1.724	39.000	8.000
Ba (mg/L)		0.01					0.11	0.06	0.08	0.13	39.00	
Benzene (µg/L)				100.00	ND/370	ND/40	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Ca (mg/L)		1					105.52	72.21	88.00	110.20	39.00	
CBOD5 (mg/L)		1	10.0				5.23	1.72	3.00	5.80	23.00	
Cd (mg/L)	0.0002*	0.0001		0.00020	.001/.00009	calculation	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Cl (mg/L)		1			640/120	600/150	228.77	27.05	102.00	218.80	39.00	17.00
Co (mg/L)	0.0009	0.0002				0.110/0.004	0.0016	0.0007	0.0012	0.0017	27.0000	
COD (mg/L)		5					74.71	36.50	52.00	74.60	38.00	
Conductivity (µmho/cm)		5					2008.70	682.94	1290.00	2010.00	39.00	
Cr (mg/L)	0.0089**	0.001		0.009	ND/.001		0.005	0.002	0.003	0.005	38.000	0.000
Cu (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.0041	0.0018	0.0030	0.0040	39.0000	22.0000
Dichloromethane (µg/L)				100.00	ND/9811		#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
DOC (mg/L)		0.50					26.89	14.27	19.80	27.84	39.00	
Fe (mg/L)	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	1.126	0.282	0.610	1.222	39.000	36.000
Filtration							#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Hardness as CaCO3 (mg/L)		1					400.28	265.98	329.00	412.60	39.00	
Hg (mg/L)	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	0.00003	0.00002	0.00003	0.00003	2.00000	0.00000
K (mg/L)		1					73.34	7.20	36.00	75.58	39.00	
Mg (mg/L)		1					39.12	14.91	24.00	38.98	39.00	
Mn (mg/L)		0.01					0.08	0.04	0.06	0.09	39.00	
Na (mg/L)		2		180.00			243.63	26.27	118.00	247.40	39.00	9.00
N-NH3 (mg/L)		0.02	1.0				0.646	-0.108	0.170	0.553	39.000	
N-NH3 (Unionized - calcula	0.02			0.0200			0.0129	-0.0052	0.0012	0.0047	31.0000	2.0000
N-NO2 (mg/L)		0.10				0.6/0.2	0.17	0.16	0.17	0.17	2.00	
N-NO3 (mg/L)		0.10			124/3.0	32.8/3.0	70.42	10.30	32.90	78.76	39.00	36.00
P - Total (mg/L)	0.03*	0.01	0.3	0.030			0.165	0.065	0.106	0.162	38.000	38.000
Pb (mg/L)	0.025	0.001		0.0250	ND/.007	0.003/ND	2.8452	-1.6088	0.0004	0.0018	13.0000	1.0000
pH	6.5-8.5						8.29	7.82	8.11	8.30	26.00	
Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.0047	0.0019	0.0030	0.0050	18.0000	
Se (mg/L)	0.1	0.001					#DIV/0!	#DIV/0!	65.00	65.00	1.00	
SO4 (mg/L)		1				429.00	178.25	50.11	107.00	144.40	39.00	0.00
TDS (COND - CALC) (mg/L)		5					1303.60	432.61	838.00	1287.60	39.00	
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Toluene-d8 (%)	0.0001	0.0001					110.51	96.09	102.00	112.60	10.00	
Total Kjeldahl Nitrogen (mg/L)		0.10					3.82	1.70	2.50	4.02	39.00	
Total P - Soluble (mg/L)							0.10	0.03	0.06	0.12	27.00	
Total Suspended Solids (mg/L)		2	10.0				43.56	13.78	28.00	51.20	39.00	
Vinyl Chloride (µg/L)				600.00			#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00	
Zn (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.03	0.01	0.01	0.03	21.00	
Field Data												
Temperature (C)							18.01	1.66	9.20	21.42	34.00	
pH	6.5-8.5						8.47	6.88	7.92	8.57	34.00	
Conductivity (µmho/cm)							1504.47	435.52	1082.50	1541.80	30.00	
Dissolved Oxygen (mg/L)			4.00				13.35	7.49	10.53	13.97	29.00	

Surface Water Station SW2												Est'd	Est'd	Est'd
measured / estimated flow								153.00	60.00	0.70	0.00	44.00	41.00	21.00
effluent discharge (L/sec)								50.00	50.00	0.00	0.00	20.00	20.00	20.00
Station				Regulated				SW2	SW2	SW2	SW2	SW2	SW2	SW2
LAB ID:				Effluent				1428323.00	1431590.00			B19-26597	B19-27095	B19-27537
	Sample Date			Parameter	PWQO (APV for Cl	CCME Surface Water	Environment BC	2019-05-23	2019-06-06	2019-7-10	2019-8-8	2019-8-23	2019-8-27	2019-8-30
Analyte	PARAMETER	PWQO	MRL	mg/L										
1,2-dichloroethane-d4 (%)								101	100					
1,4-dichlorobenzene (µg/L)					4.00			<0.4	<0.4			< 0.5	< 0.5	< 0.5
4-bromofluorobenzene (%)								90	120					
Ag (mg/L)	Silver (mg/L)	0.0001	0.0001					<0.0001	<0.0001					
Al (dissolved) (mg/L)	Al (dissolved)(mg/L)	0.075*	0.01					0.09	0.1					
Alkalinity as CaCO3 (mg/L)	Alkalinity as CaCO3 (mg/L)		5					275	245			301	302	298
As (mg/L)	Arsenic	0.1	0.001					0.001	0.001					
B (mg/L)	Boron (mg/L)	0.2*	0.01		0.2*	29/1.5	ND/1.2	1.82	2.7			5.23	5.3	4.89
Ba (mg/L)	Barium (mg/L)		0.01					0.12	0.21			0.175	0.16	0.141
Benzene (µg/L)					100.00	ND/370	ND/40							
Ca (mg/L)	Calcium		1					94	105			100		66.9
CBOD5 (mg/L)	Biochemical Oxygen Demand* (mg/L)		1	10.0				<0.5	<0.5			< 0.5	< 0.5	< 0.5
Cd (mg/L)	Cadmium	0.0002	0.0001		0.00	.001/.00009	calculation	<0.0001	<0.0001			< 0.000070	< 0.000070	< 0.000070
Cl (mg/L)	Chloride (mg/L)		1			640/120	600/150	251	384			780	697	976
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	0.0023	0.0037				80.4	
COD (mg/L)	Chemical Oxygen Demand (mg/L)		5					93	113			177	151	147
Conductivity (µmho/cm)	Conductivity (µS/cm)		5					2100	3200			5570	5220	5090
Cr (mg/L)	Chromium (total)	0.0089**	0.001		0.009	ND/.001		0.007	0.008			0.008	0.007	0.006
Cu (mg/L)	Copper* (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002			0.0036	0.0067	0.0063
Dichloromethane (µg/L)					100.00	ND/9811		<4.0	<4.0			< 5	< 5	< 5
DOC (mg/L)	Dissolved Organic Carbon		0.50					34.1	43.5			19.4	40	17.5
Fe (mg/L)	Iron* (mg/L)	0.3	0.03	1.0	0.30	ND/0.3	0.001/ND	0.16	0.15			0.077	0.058	0.046
Filtration								Y	Y					
Hardness as CaCO3 (mg/L	Hardness as CaCO3		1					412	509			657		
Hg (mg/L)	Mercury	0.0002	0.0001		0.00020	ND/.000026	ND/calculation	0.0001	0.0001			< 0.00002	< 0.00002	0.00004
K (mg/L)	Potassium (mg/L)		1					97	153			247	247	254
Mg (mg/L)	Magnesium (mg/L)		1					43	60			99	102	96.1
Mn (mg/L)	Manganese		0.01					0.04	0.04			0.014	0.007	0.009
Na (mg/L)	Sodium (mg/L)		2		180.00			309	441			907	836	830
N-NH3 (mg/L)	N-NH3 (Ammonia)* (mg/L)		0.02	1.0				0.7	0.194			0.39	0.25	0.3
N-NH3 (Unionized - calcula	NH3 (un-ionized Amr	0.02			0.0200									
N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10				0.6/0.2	<0.10	<0.10			< 0.1	< 1	< 0.1
N-NO3 (mg/L)	N-NO3 (Nitrate) (mg/L)		0.10			124/3.0	32.8/3.0	95.8	100			< 0.1	189	287
P - Total (mg/L)	Total Phosphorus* (mg	0.03*	0.01	0.3	0.030			0.211	0.162			0.09	0.08	0.14
Pb (mg/L)	Lead	0.025	0.001		0.03	ND/.007	0.003/ND	<0.001	<0.001			0.0001	0.0001	< 0.0001
pH	pH (pH units)	6.5-8.5						8.28	8.3					
Phenols (mg/L)	Phenols* (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001			< 0.002	< 0.002	< 0.002
Se (mg/L)	Selenium (mg/L)	0.1	0.001					<0.001	<0.001					
SO4 (mg/L)	Sulphate (mg/L)		1				429.00	159	314			732	606	781
TDS (COND - CALC) (mg/L	TDS (COND - CALC) (mg/L)		5					1360	2240			3046	3589	4454
Toluene (µg/L)					0.80	ND/.002	ND/0.0005	<0.5	<0.5			< 0.5	< 0.5	< 0.5
Toluene-d8 (%)								99	105					
Total Kjeldahl Nitrogen (mg	Total Kjeldahl Nitrogen (mg/L)		0.10					3.3	3.39			7	6.3	5.2
Total P - Soluble (mg/L)								0.16	0.115					
Total Suspended Solids (mg/L)	Total Suspended Solids* (mg/L)	2		10.0				7	13			14	10	12
Vinyl Chloride (µg/L)					600.00			<0.2	<0.2			< 0.2	< 0.2	< 0.2
Zn (mg/L)	Zinc* (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.02	0.03			0.038	0.028	0.028
										Field Measuren	Field Measurements and flow only			
Chromium (mg/L)		0.01												
Field Data	**Field Data**													
Temperature (C)	Temperature (ºC)							13.80	19.40	28.80	23.20	23.80	21.50	19.20
pH	pH (field) (pH units)	6.5-8.5						7.94	8.21	9.40	8.04	7.89	8.33	8.40
Conductivity (µmho/cm)	Conductivity (field) (µS/cm)							1912.00	3477.00	422.00	970.00			
Dissolved Oxygen (mg/L)	Dissolved Oxygen* 4			4				12.13	18.22	13.60	4.93			

2			Est'd		Est'd	Est'd		Est'd		Est'd.		Est'd.			
/			17.00	3.90	ND	25.00	3.00	7.10	98.00	14.00	15.00	93.00	77.00	206.00	129.00
			20.00	20.00	20.00	20.00	0.00	10.00	10.00	10.00	10.00	10.00	10.00	50.00	50.00
			SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
			B19-27824		B19-28281	B19-28725	1459461.00	B19-33323-2	B19-33766-2	B19-34301-2	B19-34716-2	B19-35135-2	B19-35418-2	1464895.00	1471805.00
Sample Date			2019-9-3	2019-9-4	2019-9-6	2019-9-10	2019-10-10	2019-10-15	2019-10-18	2019-10-22	2019-10-25	2019-10-29	2019-10-31	2019-11-06	2019-12-11
PARAMETER	PWQO	MRL													
							98.2								
			< 0.5		< 0.5	< 0.5	<0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
							99								
Silver (mg/L)	0.0001	0.0001					<0.0001							<0.0001	<0.0001
Al (dissolved)(mg/L)	0.075*	0.01					0.02							0.09	0.21
Alkalinity as CaCO3 (mg/L)		5	284		392	432	219	413	148	264	222	167	198	255	256
Arsenic	0.1	0.001					<0.001							0.001	0.001
Boron (mg/L)	0.2*	0.01	4.68		2.53	5.05	0.51	4.66	0.615	2.09	1.36	0.451	0.7	1.6	2.38
Barium (mg/L)		0.01	0.161		0.059	0.13	0.05	0.139	0.06	0.108	0.104	0.076	0.076	0.1	0.17
Calcium		1	98.7		32.3	85	89	103	73.4	86.2	98.3	95.8	92.3	112	110
Biochemical Oxygen Demand* (mg/L)		1	< 0.5		< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Cadmium	0.0002	0.0001	< 0.000070		< 0.000070	< 0.000070	<0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	<0.0001	<0.0001
Chloride (mg/L)		1	725		415	1080	103	689	118	366	247	107	129	222	371
Cobalt	0.0009	0.0002					0.0011							0.0018	0.003
Chemical Oxygen Demand (mg/L)		5	162		85	172	35	177	112	98	93	71	69	82	104
Conductivity (µS/cm)		5	5230		2900	5380	1050	5170	1130	2880	2160	1110	1350	2270	3030
Chromium (total)	0.0089**	0.001	0.008		0.003	0.011	0.003	0.012	0.003	0.006	0.004	0.002	0.002	0.005	0.009
Copper* (mg/L)	0.005	0.001	0.0031		0.0041	0.0086	0.002	0.0034	0.0042	0.0049	0.0033	0.0064	0.0058	0.002	0.002
			< 5		< 5	< 5	<4.0	< 5	< 5	< 5	< 5	< 5	< 5		
Dissolved Organic Carbon		0.50	17.6		14.5	45.8	14.8	53.2	20.3	18.5	28.6	20.5	25.2	34	44.4
Iron* (mg/L)	0.3	0.03	0.12		0.149	0.097	0.82	0.275	0.695	0.385	0.363	0.436	0.299	0.16	0.3
							Y							Y	Y
Hardness as CaCO3		1					305	653	270	422	409	339	340	461	514
Mercury	0.0002	0.0001			< 0.00002	< 0.00002	<0.0001	< 0.00002	0.00005	< 0.00002	0.00004	< 0.00002	< 0.00002	<0.0001	<0.0001
Potassium (mg/L)		1	237		109	249	27	240	37.5	115	77.2	30	37.8	79	122
Magnesium (mg/L)		1	90.5		50	101	20	96.3	21.1	50.3	39.6	24.1	26.7	44	58
Manganese		0.01	0.018		0.01	0.008	0.02	0.013	0.038	0.02	0.022	0.043	0.032	0.02	0.06
Sodium (mg/L)		2	815		417	897	97	785	112	354	239	102	127	236	336
N-NH3 (Ammonia)* (mg/L)		0.02	0.32		0.14	0.18	0.044	0.24	0.25	0.27	0.31	0.38	0.27	0.063	0.31
NH3 (un-ionized Amr	0.02						0.001551759	0.0069	0.0009	0.0031	0.0024	0.0005	0.0018	0.000596701	0.002786788
N-NO2 (Nitrite)		0.10	< 1		< 0.1	< 1	<0.10	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.10	<0.10
N-NO3 (Nitrate) (mg/L)		0.10	221		51.9	210	18.2	255	33	137	83.9	23.1	30.7	77.4	136
Total Phosphorus* (mg	0.03*	0.01	0.2		0.08	0.13	0.106	0.08	0.17	0.12	0.1	0.18	0.17	0.217	0.316
Lead	0.025	0.001	0.0002		0.0002	0.0002	<0.001	0.0002	0.0005	0.0002	0.0003	0.0004	0.0002	<0.001	<0.001
pH (pH units)	6.5-8.5						8.44							8.35	7.96
Phenols* (mg/L)	0.001	0.001	< 0.002		< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.002	<0.001	0.005
Selenium (mg/L)	0.1	0.001					<0.001							<0.001	<0.001
Sulphate (mg/L)		1	620		282	542	82	372	120	246	202	141	170	211	235
TDS (COND - CALC) (mg/L)		5	3736		1770	4146	682	3665	718	1984	1408	703	838	1480	1970
			< 0.5		< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
							95								
Total Kjeldahl Nitrogen (mg/L)		0.10	7.6		3.7	8.2	1.09	7.4	2.9	4.6	3.9	3	2.9	1.71	
							0.07							0.172	0.151
Total Suspended Solids* (mg/L)		2	14		9	11	22	16	22	11	33	9	9	12	20
			< 0.2		< 0.2	< 0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2		
Zinc* (mg/L)	0.03	0.01	0.045		0.013	0.055	<0.01	0.051	0.012	0.022	0.022	0.012	0.011	0.02	0.03
				Field Measurements and flow only											
	0.01														
Field Data															
Temperature (ºC)			20.10	20.60	18.50	17.50	9.40	10.40	8.20	10.30	8.30	8.40	11.90	5.30	0.48
pH (field) (pH units)	6.5-8.5		8.10	8.30	8.41	8.08	8.32	8.35	7.53	7.92	7.95	7.25	7.63	7.88	8.03
Conductivity (field) (µS/cm)				1875.00			948.00							2184.00	160.00
Dissolved Oxygen* 4				7.12			13.94							11.40	meter frozen

2														
/			54.50	1.50	392.70	286.50	78.60	56.80	158.40	360.80	47.90	25.97	133.10	121.51	79.00
			50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	12.00	0.00	0.00	0.00	50.00
			1475059.00	1480020.00	1485311.00	1487984.00	1492673.00	1493686.00	1507643.00	1508118.00	1513027.00	1521855.00	1526416.00	1533867.00	1538396
			SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2
Sample Date			2020-01-10	2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09	2021-01-14
PARAMETER	PWQO	MRL													
			89			108			108				86		
			<0.4			<0.4			<0.4				<0.4		
			100			107			90				107		
Silver (mg/L)	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Al (dissolved)(mg/L)	0.075*	0.01	0.13	0.12	0.02	0.03	0.44	0.35	0.26	0.2	0.11	0.15	0.12	0.07	0.11
Alkalinity as CaCO3 (mg/L)		5	8	207	159	190	301	349	210	259	263	370	324	245	149
Arsenic	0.1	0.001	0.002	0.002	<0.001	0.001	0.002	0.001	0.002	0.002	0.002	0.002	0.001	<0.002	0.001
Boron (mg/L)	0.2*	0.01	4.6	7.1	0.11	0.88	2.67	2.73	1.4	1.2	1.9	2.1	2.1	2.05	3.6
Barium (mg/L)		0.01	0.27	0.41	0.03	0.08	0.15	0.12	0.08	0.08	0.1	0.08	0.09	0.19	0.29
													<0.5		
Calcium		1	98	67	66	75	65	62	74	94	99	90	107	131	104
Biochemical Oxygen Demand* (mg/L)		1	<0.5			<0.5			<0.5		7	6	4	5	4
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Chloride (mg/L)		1	639	851	48	117	390	360	190	162	218	329	335	364	531
Cobalt	0.0009	0.0002	0.0048	0.0059	0.0004	0.001	0.0037	0.0035	0.0024	0.0018	0.0022	0.003	0.0038	0.0027	0.004
Chemical Oxygen Demand (mg/L)		5	206	250	56	63	133	110	72	67	70	78	98	108	121
Conductivity (µS/cm)		5	8	6080	592	1300	3310	3090	1830	1600	2220	2790	3100	3130	4290
Chromium (total)	0.0089**	0.001	0.014	0.016	<0.001	0.003	0.008	0.007	0.004	0.004	0.004	0.004	0.006	0.008	0.011
Copper* (mg/L)	0.005	0.001	0.002	0.002	0.002	0.002	0.003	0.004	0.005	0.005	0.003	0.004	0.003	0.002	0.001
			<4.0			<4.0			<4.0				<4.0		
Dissolved Organic Carbon		0.50	66.7	106	13.4	24.6	49.5	44.4	29.9	29.5	28.1	32.5	40.4	37.9	53
Iron* (mg/L)	0.3	0.03	0.27	0.26	0.37	0.45	0.23	0.15	0.78	0.73	0.31	0.18	0.15	0.22	0.24
			Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y
Hardness as CaCO3		1	603	620	206	286	418	357	308	366	412	410	481	578	618
Mercury	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium (mg/L)		1	211	323	6	36	144	117	71	57	82	99	117	123	201
Magnesium (mg/L)		1	87	110	10	24	62	49	30	32	40	45	52	61	87
Manganese		0.01	0.03	0.05	0.09	0.04	0.04	0.03	0.04	0.06	0.03	0.02	0.01	0.02	0.03
Sodium (mg/L)		2	598	1020	38	130	537	442	211	177	277	345	397	379	573
N-NH3 (Ammonia)* (mg/L)		0.02	0.944	2.64	1.33	0.954	0.101	0.126	0.464	0.287	0.32	0.332	0.316	0.11	0.134
NH3 (un-ionized Amr	0.02		0.020427452	0.000472398	0.01185057	0.0015	0.003699679	0.000502363	0.002286996	0.04584914	0.003422896	0.018201629	0.000735683	7.01227E-05	0.000746307
N-NO2 (Nitrite)		0.10	0.2	<0.10	<0.10	<0.10	<0.10	<0.10	0.25	<0.10	0.13	<0.10	<1.0	<0.10	<0.10
N-NO3 (Nitrate) (mg/L)		0.10	201	395	5.79	47.9	139	111	68	44.6	80.4	89.3	147	162	254
Total Phosphorus* (mg	0.03*	0.01	0.25	0.215	0.545	0.18	0.14	0.11	0.339	0.26	0.45	0.147	0.142	0.186	0.235
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)	6.5-8.5		8.03	7.96	7.81	7.99	8.43	8.41	8.19	7.98	8.09	8.31	8.24	8.2	7.81
Phenols* (mg/L)	0.001	0.001	0.015	0.012	0.007	0.002	0.004	<0.001	0.006	0.006	0.008	<0.010	<0.001	<0.002	<0.001
Selenium (mg/L)	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Sulphate (mg/L)		1	225	237	48	96	233	229	150	164	236	219	199	243	236
TDS (COND - CALC) (mg/L)		5	5	3950	385	845	2150	2010	1190	1040	1440	1810	2020	2030	2790
			<0.5			<0.5			<0.5				<0.5		
			107			103			102				91		
Total Kjeldahl Nitrogen (mg/L)		0.10	10.5	13.4	3.09	5.86	6.93	9.14	5051	3.64	4.2	4.72	4.96	7.66	6.95
			0.117	0.115	0.321	0.0839	0.06	0.067	0.02	0.111	0.201	0.143	0.159	0.135	0.07
Total Suspended Solids* (mg/L)		2	10	8	21	18	25	36	58	104	16	10	10	18	27
			<0.2			<0.2			<0.2				<0.2		
Zinc* (mg/L)	0.03	0.01	0.04		<0.01	<0.01	0.02	0.02	0.01	0.01	<0.01	0.01	0.02	0.03	0.04
	0.01														
Field Data															
Temperature (ºC)			0.40	0.20	0.10	4.10	9.90	8.80	20.70	20.20	15.70	10.00	1.59	0.40	0.77
pH (field) (pH units)	6.5-8.5		8.42	6.35	8.04	7.15	8.32	7.38	7.08	8.68	7.58	8.50	7.40	6.88	NA [7]
Conductivity (field) (µS/cm)			>4000	meter frozen	569.00	1243.00	3202.00	2927.00	1710.00	1498.00	2122.00	2615.00	2702.00	2861.00	NA [7]
Dissolved Oxygen* 4			3.77	13.05	8.76	13.50	15.16	17.65	6.20	3.29	6.86	9.60	11.08	12.69	14.52

2													SW2: Statistics - Upgraded Treated Leachate Period 2				
/			56.00	443.00	73.00	82.00	27.00	261.00	101.00	208.00	204.00		May 23, 2019 to December 3, 2021				
			50.00	50.00	50.00	50.00	38.00	50.00	50.00	15.00	50.00		Group 4				
			1543597.00	1548367.00	1553595.00	1557483.00	1565637.00	1569096.00	1587663	1593964.00	1599817.00						
			SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2	SW2		N - BC				
Sample Date			2021-02-25	2021-03-30	2021-04-23	2021-05-14	2021-06-28	2021-07-15	2021-10-05	2021-11-04	2021-12-03						
PARAMETER	PWQO	MRL											MEAN	Standard Deviation	+ve SD	-ve SD	Grp D Median
			128			116				112			104.62	12.56	117.18	92.06	104.50
			<0.4			<0.4				<0.4			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
			86			86				75			96.00	13.15	109.15	82.85	94.50
Silver (mg/L)	0.0001	0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Al (dissolved)(mg/L)	0.075*	0.01	0.38	0.06	0.04	0.22	0.19	0.1	<0.01	0.1	0.05		0.14	0.11	0.26	0.03	0.11
Alkalinity as CaCO3 (mg/L)		5	206	197	202	293	354	228	315	297	273		258.21	81.51	339.71	176.70	259.00
Arsenic	0.1	0.001	0.002	0.001	<0.001	0.002	0.002	0.002	0.002	0.001	0.001		0.00	0.00	0.00	0.00	0.00
Boron (mg/L)	0.2*	0.01	3.8	0.57	0.06	3.6	4	1.6	3.4	2.4	1.51		2.56	1.71	4.27	0.85	2.10
Barium (mg/L)		0.01	0.23	0.06	0.05	0.19	0.23	0.09	0.12	0.12	0.08		0.13	0.08	0.21	0.06	0.12
			<0.5			<0.5				<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Calcium		1	63	79	80	102	120	84	108	127	111		90.73	20.28	111.02	70.45	94.00
Biochemical Oxygen Demand* (mg/L)		1	2	2	<1	3	2	<1	3	<1	2		3.64	1.75	5.38	1.89	3.00
Cadmium	0.0002	0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Chloride (mg/L)		1	557	105	36	440	530	168	344	300	210		381.64	261.73	643.37	119.91	344.00
Cobalt	0.0009	0.0002	0.0038	0.0008	0.0003	0.0052	0.0053	0.002	0.0044	0.0037	0.0025		2.8743	15.1936	18.0679	-12.3194	0.0030
Chemical Oxygen Demand (mg/L)		5	144	70	39	136	132	75	81	78	98		108.36	46.55	154.90	61.81	98.00
Conductivity (µS/cm)		5	4210	1140	620	3780	3920	1750	3210	2910	2100		2867.18	1569.77	4436.95	1297.41	2900.00
Chromium (total)	0.0089**	0.001	0.011	0.002	<0.001	0.012	0.009	0.004	0.006	0.006	0.005		0.007	0.004	0.010	0.003	0.006
Copper* (mg/L)	0.005	0.001	0.001	0.002	0.002	0.003	0.002	0.004	0.003	0.003	0.003		0.0034	0.0017	0.0051	0.0017	0.0030
			<4.0			<4.0				<4.0			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Dissolved Organic Carbon		0.50	52	23.7	17	59	47.5	27.1	43	40	29.3		35.55	17.91	53.46	17.64	32.50
Iron* (mg/L)	0.3	0.03	0.23	0.43	0.37	0.4	0.2	0.46	0.33	0.22	0.34		0.305	0.191	0.50	0.11	0.27
			Y	Y	Y	Y	Y	y	Y	y	Y		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Hardness as CaCO3		1	483	284	249	547	613	342	517	572	450		441.50	126.89	568.39	314.61	420.00
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.00007	0.00003	0.00010	0.00004	0.00008
Potassium (mg/L)		1	195	28	4	184	179	56	129	121	78		126.14	81.93	208.07	44.21	117.00
Magnesium (mg/L)		1	79	21	12	71	76	32	60	62	42		55.53	28.25	83.79	27.28	50.30
Manganese		0.01	0.03	0.04	0.06	0.05	0.03	0.02	0.01	<0.01	0.03		0.03	0.02	0.05	0.01	0.03
Sodium (mg/L)		2	685	106	26	662	618	192	372	387	254	0.04	417.08	274.67	691.74	142.41	372.00
N-NH3 (Ammonia)* (mg/L)		0.02	4.76	1.46	0.318	0.048	0.224	0.221	0.25	0.061	<0.010		0.527	0.859	1.39	-0.33	0.28
NH3 (un-ionized Amr	0.02		0.009925513	0.001550023	0.000408708	0.001599135	0.004934508	0.009021556	0.007452565	0.000195672	NC		0.0055	0.0092	0.0147	-0.0037	0.0020
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<5.0	<0.50	<0.10	<0.10	<0.10		0.193	0.060	0.254	0.133	0.200
N-NO3 (Nitrate) (mg/L)		0.10	218	30.9	2.33	212	214	68	127	137	91.4		126.17	89.61	215.78	36.57	105.50
Total Phosphorus* (mg	0.03*	0.01	0.247	0.228	<0.001	0.251	0.347	0.143	0.358	0.255	0.222		0.205	0.103	0.308	0.102	0.183
Lead	0.025	0.001	<0.001	<0.001	8.22	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.69	2.37	3.06	-1.69	0.0002
pH (pH units)	6.5-8.5		7.92	7.72	<0.0010	8.06	8.04	7.78	8.1	7.92	7.94		8.09	0.21	8.30	7.88	8.05
Phenols* (mg/L)	0.001	0.001	0.006	0.006		<0.010	0.002	0.005	<0.004	<0.001	0.002		0.0059	0.0037	0.0096	0.0022	0.0060
Selenium (mg/L)	0.1	0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Sulphate (mg/L)		1	260	92	59	200	220	127	168	170	138		250.36	174.12	424.48	76.24	219.00
TDS (COND - CALC) (mg/L)		5	2740	741	403	2460	2550	1140	2090	1890	1360		1918.67	1123.86	3042.53	794.81	1890.00
			<0.5			<0.5				<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
			99			116				97			101.40	7.00	108.40	94.40	100.50
Total Kjeldahl Nitrogen (mg/L)		0.10	14.9	3.51	1.75	7.37	5.93	3.11	5.6	6.94	4.53		138.37	818.48	956.84	-680.11	5.08
			0.101	0.233	0.072	0.148	0.299	0.102	0.302	0.184	0.154		0.14	0.08	0.22	0.07	0.14
Total Suspended Solids* (mg/L)		2	18	35	18	34	14	24	12	16	52		21.23	17.82	39.05	3.42	16.00
			<0.2			<0.2							#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!
Zinc* (mg/L)	0.03	0.01	0.02	<0.01	<0.01	0.02	0.02	<0.01	0.01	<0.2	0.01		0.02	0.01	0.04	0.01	0.02
	0.01									0.02							
Field Data																	
Temperature (ºC)			2.20	2.10	3.30	15.50	23.50	22.10	15.20	5.50	0.90		11.48	8.40	19.88	3.08	10.15
pH (field) (pH units)	6.5-8.5		7.33	7.04	7.08	8.09	7.65	7.97	8.05	7.40	---[2]		7.86	0.58	8.44	7.28	7.96
Conductivity (field) (µS/cm)			3499.00	1026.00	562.00	3546.00	3797.00	1701.00	3133.00	2888.00	---[2]		2059.58	1097.68	3157.26	961.90	2017.00
Dissolved Oxygen* 4			11.60	11.17	14.40	11.05	6.42	6.30	8.83	11.99	15.11		10.84	3.98	14.82	6.86	11.40

2					
/					
Sample Date					
PARAMETER	PWQO	MRL	Grp D 90th %	Count	Count > Objective
			117.20	10.00	
			#NUM!	0.00	
			108.30	10.00	
Silver (mg/L)	0.0001	0.0001	#NUM!	0.00	
Al (dissolved)(mg/L)	0.075*	0.01	0.31	26.00	
Alkalinity as CaCO3 (mg/L)		5	357.20	39.00	
Arsenic	0.1	0.001	0.00	23.00	
Boron (mg/L)	0.2*	0.01	4.92	39.00	30.00
Barium (mg/L)		0.01	0.23	39.00	
			#NUM!	0.00	
Calcium		1	111.30	38.00	
Biochemical Oxygen Demand* (mg/L)		1	6.00	11.00	
Cadmium	0.0002	0.0001	#NUM!	0.00	
Chloride (mg/L)		1	736.00	39.00	31.00
Cobalt	0.0009	0.0002	0.0052	28.0000	
Chemical Oxygen Demand (mg/L)		5	173.00	39.00	
Conductivity (µS/cm)		5	5222.00	39.00	
Chromium (total)	0.0089**	0.001	0.011	37.000	
Copper* (mg/L)	0.005	0.001	0.0059	39.0000	24.0000
			#NUM!	0.00	
Dissolved Organic Carbon		0.50	53.04	39.00	
Iron* (mg/L)	0.3	0.03	0.51	39.00	16.00
			#NUM!	0.00	
Hardness as CaCO3		1	616.50	34.00	
Mercury	0.0002	0.0001	0.00010	6.00000	
Potassium (mg/L)		1	247.00	39.00	
Magnesium (mg/L)		1	96.84	39.00	
Manganese		0.01	0.05	38.00	
Sodium (mg/L)		2	831.20	39.00	30.00
N-NH3 (Ammonia)* (mg/L)		0.02	1.07	38.00	
NH3 (un-ionized Amr	0.02		0.0125	30.0000	2.0000
N-NO2 (Nitrite)		0.10	0.240	3.000	
N-NO3 (Nitrate) (mg/L)		0.10	230.90	38.00	37.00
Total Phosphorus* (mg	0.03*	0.01	0.341	38.000	38.000
Lead	0.025	0.001	0.0005	12.00	
pH (pH units)	6.5-8.5		8.38	26.00	
Phenols* (mg/L)	0.001	0.001	0.0104	15.0000	
Selenium (mg/L)	0.1	0.001	#NUM!	0.00	
Sulphate (mg/L)		1	554.80	39.00	5.00
TDS (COND - CALC) (mg/L)		5	3679.20	39.00	
			#NUM!	0.00	
			107.90	10.00	
Total Kjeldahl Nitrogen (mg/L)		0.10	9.55	38.00	
			0.26	27.00	
Total Suspended Solids* (mg/L)		2	35.20	39.00	
			#NUM!	0.00	
Zinc* (mg/L)	0.03	0.01	0.04	30.00	
				0.00	
	0.01			0.00	
Field Data					
Temperature (ºC)			22.04	42.00	
pH (field) (pH units)	6.5-8.5		8.41	40.00	
Conductivity (field) (µS/cm)			3488.00	26.00	
Dissolved Oxygen* 4			15.12	29.00	

Surface Water Station SWAF1																
	Measured / Estimated Flow (L/sec)				CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)	71.00	21.00	32.00	3.90	4.30	3.70	14.00	3.10	5.10	18.00
	Effluent Discharge (L/sec)						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							1428333.00	1431591.00	1434216.00		1440944.00	1446259.00		1455466.00	1459462.00	1460892.00
				PWQO (APV for Cl and Na)			SWAF1	SWAF1	SWAF1		SWAF1	SWAF1		SWAF1	SWAF1	SWAF1
							2019-05-23	2019-06-06	2019-06-19	2019-7-10	2019-07-12	2019-08-08	2019-9-4	2019-09-23	2019-10-10	2019-10-18
Analyte	Units	nalytical Metho	MRL													
1,2-dichloroethane-d4	%	EPA 8260	0.00				99	105							94.4	
1,4-dichlorobenzene	ug/L	EPA 8260	0.40	4.00			<0.4	<0.4							<0.4	
4-bromofluorobenzene	%	EPA 8260	0.00				94	119							99	
Ag	mg/L	EPA 200.8	0.00				<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Al (dissolved)	mg/L	EPA 200.8	0.01				0.02	<0.01	0.01		0.02	0.01		<0.01	0.02	0.1
Alkalinity as CaCO3	mg/L	2320,2510,4500	5.00				137	134	236		151	203		175	205	117
As	mg/L	EPA 200.8	0.00				0.001	0.001	0.002		0.002	0.002		0.001	<0.001	0.001
B	mg/L	EPA 200.8	0.010	0.2*	29/1.5	ND/1.2	0.1	0.1	0.16		0.17	0.13		0.18	0.11	0.21
Ba	mg/L	EPA 200.8	0.01				0.03	0.03	0.04		0.03	0.05		0.04	0.03	0.03
Benzene	ug/L	EPA 8260	0.50	100.00	ND/370	ND/40	<0.5	<0.5							<0.5	
Ca	mg/L	SM3120B-3500	1.00				36	36	54		40	50		46	55	44
CBOD5	mg/L	SM 5210B	1.00				3	2	3		<1	3		5	3	9
Cd	mg/L	EPA 200.8	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Cl	mg/L	SM 4110	1.00		640/120	600/150	3	8	9		3	4		10	8	6
Co	mg/L	EPA 200.8	0.0002			0.110/0.004	0.0014	0.0008	0.0005		0.0007	0.0008		0.0018	0.0012	0.0004
COD	mg/L	C SM5220D	5.00				62	69	52		65	62		65	48	53
Conductivity	uS/cm	C SM2510B	5.00				286	272	562		336	386		366	400	401
Cr	mg/L	EPA 200.8	0.0010	0.0089	ND/.001		0.006	0.002	0.002		0.003	0.004		0.005	0.006	0.002
Cu	mg/L	EPA 200.8	0.0010		ND/.004	0.029/≤0.002	0.004	0.003	0.002		0.003	0.004		0.006	0.003	0.003
Dichloromethane	ug/L	EPA 8260	4.00	100.00	ND/9811		<4.0	<4.0							<4.0	
DOC	mg/L	CONTRACT-E-IN	0.50				20.9	24.7	22		30.8	26.2		23.8	20.1	21.9
Fe	mg/L	EPA 200.8	0.030	0.300	ND/0.3	0.001/ND	2.11	1.16	0.84		1.06	1.34		2.56	2.02	0.66
Filtration		EPA 200.8					Y	Y	Y		Y	Y		Y	Y	Y
Hardness as CaCO3	mg/L	C SM2340B	1.00				119	119	192		133	166		152	183	147
Hg	mg/L	EPA 200.8	0.00	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
K	mg/L	SM3120B-3500	1.00				2	2	4		3	2		4	3	6
Mg	mg/L	SM3120B-3500	1.00				7	7	14		8	10		9	11	9
Mn	mg/L	EPA 200.8	0.01				0.08	0.23	0.21		0.04	0.12		0.23	0.06	0.03
Na	mg/L	SM3120B-3500	2.00	180.00			21	17	52		19	25		29	27	26
N-NH3	mg/L	UBCONTRACT-	0.01				0.21	0.179	0.95		0.33	0.066		0.15	0.158	0.186
-NH3 (un-ionized ammonia)				0.020								0.002796906		0.004555774	0.006510372	0.007197406
N-NO2	mg/L	SM 4110	0.10			0.6/0.2	<0.10	<0.10	0.11		<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3	mg/L	SM 4110	0.10		124/3.0	32.8/3.0	1.07	1.12	2.36		0.62	0.19		0.24	0.58	3.13
P - Total	mg/L	EPA 200.8	0.002	0.030			0.147	0.226	0.226		0.119	0.168		0.316	0.125	0.088
Pb	mg/L	EPA 200.8	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001		<0.001	<0.001		0.002	<0.001	<0.001
pH		SM2320,2510,4500	1.00				8.06	7.99	8.05		8.21	8.54		7.9	8.39	7.71
Phenols	mg/L	UBCONTRACT-	0.0010	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001		<0.001	<0.001		0.004	<0.001	<0.001
Se	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001
SO4	mg/L	SM 4110	1.00			429.00	17	13	39		23	6		7	13	64
TDS (COND - CALC)	mg/L	C SM2540	1.00				186	177	365		218	251		238	260	261
Toluene	ug/L	EPA 8260	0.50	0.80	ND/.002	ND/0.0005	<0.5	<0.5							<0.5	
Toluene-d8	%	EPA 8260	0.00				97	103							94	
Total Kjeldahl Nitrogen	mg/L	UBCONTRACT-	0.15				1.3	1.57	2.14		2.05	1.46		2	1.02	1.81
Total P - Soluble	mg/L	EPA 200.8	0.00				0.034	0.102	0.16		0.057	0.088		0.099	0.061	0.064
Total Suspended Solids	mg/L	C SM2540	2.00				164	119	35		40	38		374	58	29
Vinyl Chloride	ug/L	EPA 8260	0.20	600.00			<0.2	<0.2							<0.2	
Zn	mg/L	EPA 200.8	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01		<0.01	<0.01		0.01	<0.01	<0.01
										Field Measurements and Flow only			Field Measurements and Flow only			
Field Data																
Temperature							15.4	25.5	19.6	30.9	20.8	24.9	19.6	20.1	9.7	8
pH							7.93	8.58	7.35	8.14	7.92	7.9	8.57	meter failure	8.38	8.41
Conductivity							275.8	323	552	378	355	435	320	meter failure	394	408
Dissolved Oxygen (mg/L)							8.29	10.19	6.53	3.84	5.37	6.03	5.41	5.23	10.46	10.48

44.00	**17.00**	**12.11**	**99.41**	**63.39**	**11.48**	**10.84**	**2.67**	**8.30**	**13.64**	**14.46**	**17.91**	**10.83**	**12.00**	**94.00**	**30.00**	**12.00**	**6.00**
0.00	0.00																
1464896.00	**1471808.00**	**1475060.00**	**1485313.00**	**1487985.00**	**1492675.00**	**1493688.00**	**1507645.00**	**1508122.00**	**1513029.00**	**1521857.00**	**1526418.00**	**1533870.00**	**1538398.00**	**1548369.00**	**1553597.00**	**1557478.00**	**1565639.00**
SWAF1	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**	**SWAF1**
2019-11-06	**2019-12-11**	**2020-01-10**	**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**	**2021-01-14**	**2021-03-30**	**2021-04-23**	**2021-05-14**	**2021-06-28**
		75		109			109				86					118	
		<0.4		<0.4			<0.4				<0.4					<0.4	
		109		106			90				109					84	
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
0.02	0.05	0.03	0.03	0.02	0.05	0.07	0.83	0.89	0.26	0.32	0.01	<0.01	0.01	0.03	0.09	0.15	0.35
169	175	184	106	112	134	152	114	158	206	201	208	239	156	120	128	159	200
<0.001	0.001	<0.001	<0.001	0.001	0.001	0.001	0.002	0.002	0.002	<0.001	<0.001	0.001	0.001	0.001	0.001	0.002	0.003
0.16	0.13	0.14	0.08	0.08	0.08	0.07	0.25	0.26	0.19	0.13	0.15	0.12	0.11	0.09	0.06	0.11	0.13
0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.06	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.03
		<0.5		<0.5			<0.5				<0.5					<0.5	
50	46	52	38	38	40	40	44	50	52	51	50	66	51	43	40	53	54
1	3	3	5	2	<1	1	8	3	5	6	4	3	3	1	<1	1	2
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4	5	7	7	3	4	3	4	3	4	6	5	6	6	5	5	5	5
0.0003	0.0004	0.0005	0.0003	0.0004	0.0003	0.0002	0.0007	0.0018	0.0004	0.0005	0.0003	0.0003	0.0008	0.0003	<0.0002	0.0008	0.0005
47	41	101	44	52	64	65	84	241	51	46	44	49	45	48	61	66	44
406	389	391	277	282	285	297	339	386	408	419	448	488	366	317	317	351	391
0.001	0.002	0.002	0.001	0.002	0.001	<0.001	0.003	0.006	0.002	0.002	0.002	<0.001	0.003	<0.001	<0.001	0.002	<0.5
0.001	0.002	0.002	0.001	0.001	0.001	<0.001	0.003	0.009	0.002	0.002	0.002	0.001	0.002	<0.001		0.002	0.002
		<4.0		<4.0			<4.0				<4.0					<4.0	
20.2	20.6	23.7	16	22.2	26.9	26.8	33.8	30.4	22	18.2	16.4	17.8	22.3	20.6	25.4	28.8	25.8
0.5	0.68	1.21	0.5	0.69	0.45	0.37	1.1	2.91	0.77	0.8	0.63	0.41	1.24	0.48	0.32	1.4	0.84
Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
166	156	171	120	124	133	129	139	166	171	169	174	222	173	140	133	178	184
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
3	3	3	1	2	2	1	4	4	3	4	4	3	3	2	1	3	2
10	10	10	6	7	8	7	7	10	10	10	12	14	11	8	8	11	12
0.03	0.11	0.12	0.05	0.05	0.06	0.07	0.04	0.24	0.03	0.03	0.02	0.14	0.1	0.08	0.03	0.15	0.05
22	22	20	13	14	17	16	22	26	28	26	32	28	20	15	17	27	32
0.331	0.983	0.681	0.463	0.344	<0.010	0.061	0.18	0.162	0.07	<0.010	0.265	1.07	0.955	0.64	<0.010	0.276	<0.010
0.009562928	0.042725592	0.044075856	0.007484977	0.0012	NC	0.002824228	0.015151685	0.023368097	0.003205409	N/A	0.005418771	0.011633907	0.007620745	0.002455409	NC	0.041654572	NC
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1.6	1.1	1.19	1.96	1.85	0.32	0.16	2.21	0.92	<0.10	<0.10	0.55	1.09	1.44	3.93	2.16	0.86	<0.10
0.064	0.106	0.094	0.064	0.086	0.054	0.041	0.131	0.302	0.101	0.063	0.041	0.032	0.088	0.063	0.024	0.137	0.141
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
8.28	7.77	7.89	7.82	7.73	8.17	8.13	7.72	7.87	7.98	8.1	8.13	8.03	7.98	7.62	8.14	7.97	7.84
<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.006	0.005	0.005	0.004	<0.001	<0.001	<0.001	0.003	<0.0050	<0.010	<0.001
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	26	20	23	19	13	13	45	43	21	15	27	27	24	26	21	19	16
264	253	254	180	183	185	193	220	251	265	272	291	317	238	206	206	228	254
		<0.5		<0.5			<0.5				<0.5					<0.5	
		109		106			101				91					112	
1.63	1.7	2.65	1.79	2.67	1.54	1.81	2.49	5.95	1.1	1.1	1.36	2.16	1.82	1.67	1.14	1.95	1.48
0.045	0.072	0.0429	0.023	0.053	0.019	0.019	0.06	0.069	0.06	0.057	0.023	0.014	0.034	0.044	0.016	0.066	0.1
18	20	21	23	30	12	18	446	283	17	32	81	23	58	15		45	7
		<0.2		<0.2			<0.2				<0.2					<0.2	
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5.1	0.2	0	0.7	3.1	3.5	6.6	22.24	19.7	14.4	9.5	0.26	0.3	0.42	1.8	5.1	16.8	26.4
8.38	8.74	8.93	8.28	7.53	8.8	8.54	8.3	8.87	5.27	8.94	8.4	8.12	NA [7]	7.61	7.82	8.76	8.32
408	329	442	274	284	390	296	374	374	408	410	405	495	NA [7]	312	275	355	404
12.46	6.81	346	9.53	12		17.47	5.05	3.33	2.97	6.15	11.66	6.2	11.7	11.33	16.05	11.63	7.34

		SWAF1 - All Data, Limited Samples						
		May 23, 2019 to December 3, 2021						
NA								
1593961.00								
SWAF1			Standard					
2021-11-04		Mean	Deviation	Positive SD	negative SD	Median	90th %	N
		Mean	andard Deviatio	Positive SD	negative SD	Median	90th %	N
106		100.16	13.23	113.38	86.93	105.00	110.80	9.00
<0.4		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
76		98.44	13.72	112.17	84.72	99.00	111.00	9.00
<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
<0.01		0.15	0.25	0.39	-0.10	0.03	0.34	23.00
211		166.30	39.27	205.56	127.03	159.00	209.20	27.00
<0.001		0.00	0.00	0.00	0.00	0.00	0.00	20.00
0.19		0.137	0.052	0.189	0.084	0.130	0.198	27.000
0.03		0.03	0.01	0.04	0.02	0.03	0.04	27.00
66.9047619		66.90	#DIV/0!	#DIV/0!	#DIV/0!	66.90	66.90	1.00
62		47.44	7.68	55.12	39.77	50.00	54.40	27.00
<1		3.43	2.11	5.54	1.33	3.00	5.80	23.00
<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.0000
6		5.33	1.90	7.23	3.43	5.00	8.00	27.00
0.0005		0.0007	0.0004	0.0011	0.0002	0.0005	0.0013	26.0000
17		62.44	38.88	101.33	23.56	52.00	75	27.00
486		372.30	71.44	443.73	300.86	386.00	463.20	27.00
0.002		0.0028	0.0016	0.0044	0.0012	0.0020	0.0059	22.0000
0.002		0.0026	0.0018	0.0044	0.0008	0.0020	0.0040	24.0000
<4.0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
16.9		23.16	4.55	27.71	18.60	22.20	29.44	27.00
0.93		1.036	0.668	1.705	0.368	0.840	2.056	27.000
y		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
217		158.37	28.26	186.63	130.11	166.00	187.20	27.00
<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
4		2.89	1.15	4.04	1.73	3.00	4.00	27.00
15		9.67	2.35	12.02	7.31	10.00	12.80	27.00
0.05		0.09	0.07	0.16	0.02	0.06	0.22	27.00
30		23.81	7.91	31.72	15.91	22.00	30.80	27.00
0.648		0.41	0.33	0.73	0.08	0.28	0.95	23.00
0.022311449		0.014	0.014	0.028	-0.001	0.007	0.042	19.000
<0.10		0.11	#DIV/0!	#DIV/0!	#DIV/0!	0.11	0.11	1.00
1.31		1.33	0.94	2.27	0.39	1.11	2.32	24.00
0.064		0.115	0.076	0.192	0.039	0.094	0.226	27.000
<0.001		0.003	0.001	0.003	0.002	0.003	0.003	2.000
7.83		7.99	0.22	8.21	7.78	7.98	8.24	27.00
0.001		0.0038	0.0017	0.0054	0.0021	0.0040	0.0053	8.0000
<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
38		24.07	12.85	36.92	11.23	21.00	40.60	27.00
316		241.93	46.42	288.34	195.51	251.00	301.00	27.00
<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
128		104.56	11.15	115.70	93.41	103.00	115.20	9.00
1.86		1.90	0.92	2.82	0.97	1.79	2.55	27.00
0.033		0.06	0.03	0.09	0.02	0.06	0.10	27.00
25		78.12	114.46	192.57	-36.34	31.00	223.50	26.00
<0.2		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
<0.01		0.01	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.01	1.00
6.2		11.61	9.70	21.31	1.92	9.50	25.02	29.00
8.42		8.19	0.72	8.92	7.47	8.38	8.83	27.00
495		376.70	71.29	447.99	305.40	378.00	463.20	27.00
10.7		20.72	63.85	84.58	-43.13	8.91	13.54	28.00

EOWHF - Report of Surface Water Monitoring Results (1996 to 2010-05-20)

Sampling Station: SW2-3A-SWFD2

Surface Water Station	LAB ID:														
SWFD2	Flow (L/sec)														
	Sample ID:					1428325	1431589	1434219			1455465		1464894	1471802	
	Station					SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	
	Date					2019-05-23	2019-06-06	2019-06-19	2019-8-8	2019-9-4	2019-09-23	43748	2019-11-06	2019-12-11	43840
Analyte	PWQO	MRL	**PWQO (APV for CI and**	**CCME Surface Water Quality**	**Environment BC Surface Water**										
1,2-dichloroethane-d4 (%)						102	108								
1,4-dichlorobenzene (µg/L)						<0.4	<0.4								
4-bromofluorobenzene (%)			4			91	117								
Ag (mg/L)	0.0001	0.0001				<0.0001	<0.0001	<0.0001			<0.001		<0.0001	<0.0001	
Al (dissolved) (mg/L)	0.075*	0.01				0.01	<0.01	<0.01			<0.01		0.01	0.02	
Alkalinity as CaCO3 (mg/L)		5				178	200	252			185		160	167	
As (mg/L)	0.1	0.001				0.001	<0.001	0.003			<0.01		<0.001	<0.001	
B (mg/L)	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.09	0.08	0.21			0.2		0.09	0.05	
Ba (mg/L)		0.01				0.04	0.05	0.04					0.05	0.06	
Benzene (µg/L)			100	ND/370	ND/40	<0.5	<0.5								
Ca (mg/L)		1				79	77	96			86		96	88	
CBOD5 (mg/L)		1				3	3	2			8		<1	3	
Cd (mg/L)	0.0002	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001			<0.001		<0.0001	<0.0001	
Cl (mg/L)		1		640/120	600/150	25	30	34			66		31	29	
Co (mg/L)	0.0009	0.0002			0.110/0.004	0.0002	0.0002	<0.0002			0.006		<0.0002	0.0007	
COD (mg/L)		5				48	24	89			86		32	61	
Conductivity (µmho/cm)		5				480	469	672			641		662	593	
Cr (mg/L)	0.0089**	0.001	0.0089	ND/.001		0.001	<0.001	<0.001			0.01		<0.001	0.002	
Cu (mg/L)	0.005	0.001		ND/.004	0.029/≤0.002	0.002	0.002	<0.001			0.02		0.002	0.004	
Dichloromethane (µg/L)			100	ND/9811		<4.0	<4.0								
DOC (mg/L)		0.5				20.2	17.1	36			15.7		16.8	15.4	
Fe (mg/L)	0.3	0.03	0.3	ND/0.3	0.001/ND	0.24	0.29	0.12			6.4		0.2	0.85	
Filtration						Y	Y	Y			Y		Y	Y	
Hardness as CaCO3 (mg/L)		1				238	233	301			264		293	269	
Hg (mg/L)	0.0002	0.0001	0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001			<0.001		<0.0001	<0.0001	
K (mg/L)		1				3	3	4			8		5	4	
Mg (mg/L)		1				10	10	15			12		13	12	
Mn (mg/L)		0.005				0.08	0.07	0.22			0.6		0.01	0.14	
Na (mg/L)		2	180			19	19	32			32		24	18	
N-NH3 (mg/L)		0.02				0.29	0.052	0.12			0.82		<0.010	0.156	
N-NH3 (Unionized - calculate	0.02		0.0200								0.016085272		NA	0.003984899	
N-NO2 (mg/L)		0.10			0.6/0.2	<0.10	<0.10	<0.10			<0.10		<0.10	<0.10	
N-NO3 (mg/L)		0.10		124/3.0	32.8/3.0	2.35	1.94	0.25			<0.10		7.19	4.23	
P - Total (mg/L)	0.03*	0.01	0.030			0.37	0.159	1.64			1		0.153	0.181	
Pb (mg/L)	0.025	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001			0.03		<0.001	0.001	
pH	6.5-8.5					8.29	8.39	8			7.68		8.2	7.84	
Phenols (mg/L)	0.001	0.001	0.001	ND/0.004	.050/ND	<0.001	<0.001	<0.001			0.006		<0.001	<0.001	
Se (mg/L)	0.1	0.001				<0.001	<0.001	<0.001			<0.01		<0.001	<0.001	
SO4 (mg/L)		1			429	48	42	61			45		97	88	
TDS (COND - CALC) (mg/L)		5				312	305	437			417		430	385	
Toluene (µg/L)			0.8	ND/.002	ND/0.0005	<0.5	<0.5								
Toluene-d8 (%)						98	101								
Total Kjeldahl Nitrogen (mg/L)		0.10				1.8	1.34	1.99			8.2		1.46	1.9	
Total P - Soluble (mg/L)						0.094	0.136	1.61			0.257		0.139	0.072	
Total Suspended Solids (mg/L)		2				8	10	7			489		11	50	
Vinyl Chloride (µg/L)			600			<0.2	<0.2								
Zn (mg/L)	0.03	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01			<0.1		<0.01	<0.01	
Field Data									Field Measuren	Field Measurements and flow o		Field Measurements and flow only			
Temperature						14.4	21.8		23.5	19.3		9.3	5	0.23	
pH	6.5-8.5					8.32	8.34		8.01	8.15		8.24	7.84	8.5	
Conductivity						455	563		692	472		543	651	583	
Dissolved Oxygen (mg/L)						17.31	15.31		8.79	7.51		13.89	11.57	meter frozen	

Surface Water Station																
SWFD2			200.07	27.8	21.15	56.87	110.2	34.14	10.51	39.89	53.2	0	232	56	28
		1485315	1487988	1492676	1493689	1507646	1508121	1513030	1521858	1526419	1533872	1538399	1548371	1553599	1557475
		SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2
	43875	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09	2021-01-14	2021-03-30	2021-04-23	2021-05-14
Analyte															
1,2-dichloroethane-d4 (%)			100			107				87					118
1,4-dichlorobenzene (µg/L)			<0.4			<0.4				<0.4					<0.4
4-bromofluorobenzene (%)			105			90				109					83
Ag (mg/L)		<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)		0.02	0.01	0.03	0.02	0.52	0.29	0.08	0.16	<0.01	0.01	<0.01	0.03	0.07	0.04
Alkalinity as CaCO3 (mg/L)		122	156	174	172	104	145	197	219	216	197	176	162	171	180
As (mg/L)		<0.01	0.001	<0.001	<0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
B (mg/L)		<0.1	0.08	0.07	0.06	0.09	0.14	0.19	0.06	0.07	0.07	0.04	0.08	0.04	0.05
Ba (mg/L)		<0.1	0.04	0.04	0.04	0.05	0.06	0.07	0.06	0.05	0.04	0.05	0.04	0.05	0.04
Benzene (µg/L)			<0.5			<0.5				<0.5					<0.5
Ca (mg/L)		56	76	76	72	58	78	95	89	97	108	88	77	74	94
CBOD5 (mg/L)		7	1	<1	3	7	3	3	7	4	2	3	1	<1	3
Cd (mg/L)		<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)		19	21	22	24	22	33	40	34	36	28	25	26	24	25
Co (mg/L)		<0.002	0.0003	0.0003	0.0002	0.0009	0.0006	0.0003	0.0003	<0.0002	<0.0002	0.0004	0.0003	0.0005	0.0003
COD (mg/L)		471	50	46	39	36	45	34	34	36	55	30	51	47	42
Conductivity (µmho/cm)		388	500	496	492	442	593	815	627	676	667	545	526	503	501
Cr (mg/L)		<0.01	0.001	<0.001	<0.001	0.003	0.002	0.001	0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001
Cu (mg/L)		<0.01	0.002	0.002	0.002	0.006	0.005	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Dichloromethane (µg/L)			<4.0			<4.0				<4.0					<4.0
DOC (mg/L)		13.2	19.8	15.5	15	14.9	22.5	16.8	13.9	15.5	19	14.8	18.5	17	19.5
Fe (mg/L)		1.8	0.51	0.43	0.28	1.25	0.82	0.35	0.39	0.18	0.21	0.78	0.38	0.65	0.41
Filtration		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hardness as CaCO3 (mg/L)		169	231	231	217	178	244	311	276	300	327	269	233	222	284
Hg (mg/L)		<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)		2	2	3	2	9	12	13	6	4	3	2	3	2	3
Mg (mg/L)		7	10	10	9	8	12	18	13	14	14	12	10	9	12
Mn (mg/L)		0.4	0.05	0.08	0.06	0.03	0.05	0.02	0.03	0.02	0.02	0.03	0.05	0.09	0.07
Na (mg/L)		16	16	19	18	19	27	49	21	23	16	18	16	16	22
N-NH3 (mg/L)		0.295	0.342	0.391	0.167	0.093	0.182	0.06	<0.010	0.914	<0.010	0.075	1.17	0.285	0.06
N-NH3 (Unionized - calculate		0.00330877	0.0015	0.025496362	0.007735788	0.00523603	0.042721331	0.002353447	N/A	0.018669656	N/A	0.00074418	0.01395083	0.005041907	0.006533702
N-NO2 (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)		2.85	3.42	1.88	1.39	2.14	1.88	3.45	1.19	5.26	7.55	3.16	5.25	2.21	1.6
P - Total (mg/L)		0.59	0.23	0.055	0.031	0.309	0.268	0.71	0.313	0.096	0.205	0.075	0.315	0.136	0.058
Pb (mg/L)		<0.01	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
pH		7.78	7.94	8.28	8.48	7.83	7.88	8.02	8.08	8.13	8.06	8.1	7.63	8.09	8.23
Phenols (mg/L)		<0.001	<0.001	<0.001	<0.001	0.005	0.007	0.005	0.006	<0.001	<0.001	<0.001	0.003	<0.001	<0.0010
Se (mg/L)		<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)		45	56	49	48	71	95	162	65	80	90	67	54	44	46
TDS (COND - CALC) (mg/L)		252	325	322	320	287	385	530	408	439	434	354	342	327	326
Toluene (µg/L)			<0.5			<0.5				<0.5					<0.5
Toluene-d8 (%)			105			102				92					111
Total Kjeldahl Nitrogen (mg/L		11.3	3.21	1.79	1.36	1.36	2.15	0.8	0.979	2.21	1.74	0.931	2.61	1.98	1.56
Total P - Soluble (mg/L)		0.159	0.17	0.023	0.012	0.12	0.165	0.489	0.307	0.095	0.172	0.041	0.324	0.042	0.039
Total Suspended Solids (mg/		1790	26	14	21	85	88	7	19	8	14	97	33	25	27
Vinyl Chloride (µg/L)			<0.2			<0.2				<0.2					<0.2
Zn (mg/L)		<0.1	<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
Field Data															
Temperature		0.4	5.5	7.1	9.5	19.78	19.5	15	9.3	1.07	0.1	-0.25	4.2	8.6	19.51
pH		8.13	7.54	8.68	8.44	8.19	8.91	8.18	8.68	8.37	7.82	NA [7]	8.02	8.04	8.51
Conductivity		348	497	510	471	440	585	797	583	595	624	NA [7]	440	445	492
Dissolved Oxygen (mg/L)		10.71	12.6	16.46	23.39	6.07	3.61	6.66	8.95	12.11	12.49	12.77	11.82	14.45	14.18

Surface Water Station						SW2-3A / SWFD2 Grp. B						
SWFD2	7	3.5	1.4	4	4	2019-5-23 to 2021-12-03						
	1565640	1569100	1587665	1593958	1599819	BD - CG						
	SWFD2	SWFD2	SWFD2	SWFD2	SWFD2							
	2021-06-28	2021-07-15	2021-10-05	2021-11-04	2021-12-03							
Analyte						Mean	Standard Deviation	+ve SD	-ve SD	Median	90th %	N above DL
1,2-dichloroethane-d4 (%)				115		105.2857	10.3233	115.6091	94.9624	107.0000	116.2000	7
1,4-dichlorobenzene (µg/L)				<0.4		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
4-bromofluorobenzene (%)				81		96.5714	13.8065	110.3779	82.7649	91.0000	112.2000	7
Ag (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Al (dissolved) (mg/L)	0.06	0.05	<0.01	<0.01	<0.01	0.0841	0.1328	0.2169	-0.0487	0.0300	0.2120	17
Alkalinity as CaCO3 (mg/L)	214	173	193	185	186	179.3600	30.5940	209.9540	148.7660	178.0000	215.2000	25
As (mg/L)	0.001	0.001	<0.001	<0.001	<0.001	0.0013	0.0007	0.0020	0.0006	0.0010	0.0022	9
B (mg/L)	0.04	0.09	0.08	0.04	0.05	0.0858	0.0497	0.1355	0.0361	0.0750	0.1750	24
Ba (mg/L)	0.06	0.05	0.06	0.06	0.05	0.0500	0.0090	0.0590	0.0410	0.0500	0.0600	23
Benzene (µg/L)				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Ca (mg/L)	88	82	88	109	104	85.2400	13.4297	98.6697	71.8103	88.0000	101.2000	25
CBOD5 (mg/L)	2	<1	3	<1	<1	3.5789	2.0901	5.6690	1.4889	3.0000	7.0000	19
Cd (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Cl (mg/L)	40	38	42	32	30	31.0400	9.6974	40.7374	21.3426	30.0000	40.0000	25
Co (mg/L)	0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0007	0.0014	0.0021	-0.0007	0.0003	0.0008	17
COD (mg/L)	31	36	37	21	36	60.6800	87.0008	147.6808	-26.3208	39.0000	76.0000	25
Conductivity (µmho/cm)	553	575	661	665	644	575.4400	97.3230	672.7630	478.1170	575.0000	670.0000	25
Cr (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	0.0024	0.0028	0.0052	-0.0004	0.0015	0.0037	10
Cu (mg/L)	0.002	0.003	0.002	0.002	0.002	0.003	0.004	0.007	-0.001	0.002	0.005	23.000
Dichloromethane (µg/L)				<4.0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
DOC (mg/L)	14.2	15.9	17.1	16.1	12.6	17.3200	4.5398	21.8598	12.7802	16.1000	20.0400	25
Fe (mg/L)	0.27	0.3	0.2	0.13	0.21	0.7060	1.2479	1.9539	-0.5419	0.3500	1.0900	25
Filtration	Y	y	Y	y	Y	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Hardness as CaCO3 (mg/L)	269	246	269	330	313	260.6800	42.1819	302.8619	218.4981	269.0000	312.2000	25
Hg (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
K (mg/L)	3	3	6	4	3	4.4800	3.0155	7.4955	1.4645	3.0000	8.6000	25
Mg (mg/L)	12	10	12	14	13	11.6400	2.4132	14.0532	9.2268	12.0000	14.0000	25
Mn (mg/L)	0.03	0.03	0.01	<0.01	0.01	0.0917	0.1374	0.2291	-0.0457	0.0500	0.1960	24
Na (mg/L)	28	26	24	19	18	22.2000	7.3711	29.5711	14.8289	19.0000	30.4000	25
N-NH3 (mg/L)	<0.010	0.033	0.027	<0.010	0.046	0.2789	0.3221	0.6010	-0.0432	0.1615	0.8294	20
N-NH3 (Unionized - calculate	NC	0.002110786	0.001051618	N/A	0.000322871	0.0092	0.0113	0.0205	-0.0020	0.0050	0.0214	17.0000
N-NO2 (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
N-NO3 (mg/L)	0.64	5.15	2.4	9.29	9.39	3.5858	2.5867	6.1725	0.9992	2.6250	7.4420	24
P - Total (mg/L)	0.124	0.092	0.348	0.137	0.107	0.308	0.357	0.665	-0.049	0.181	0.662	25.000
Pb (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	0.0107	0.0167	0.0274	-0.0061	0.0010	0.0242	3
pH	8.22	7.84	7.98	7.88	7.91	8.0304	0.2158	8.2462	7.8146	8.0200	8.2860	25
Phenols (mg/L)	<0.001	0.003	<0.002	<0.001	0.001	0.0045	0.0020	0.0065	0.0025	0.0050	0.0063	8
Se (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
SO4 (mg/L)	37	57	75	78	69	66.7600	26.6071	93.3671	40.1529	61.0000	93.0000	25
TDS (COND - CALC) (mg/L)	359	374	430	432	419	374.0400	63.3374	437.3774	310.7026	374.0000	435.8000	25
Toluene (µg/L)				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Toluene-d8 (%)				95		100.5714	6.3471	106.9185	94.2243	101.0000	107.4000	7
Total Kjeldahl Nitrogen (mg/L	1.08	1.37	1.18	1.72	0.989	2.2804	2.3577	4.6381	-0.0774	1.7200	2.9700	25
Total P - Soluble (mg/L)	0.096	0.091	0.353	0.151	0.108	0.2106	0.3133	0.5239	-0.1027	0.1360	0.3414	25
Total Suspended Solids (mg/	5	10	6	4	4	114.3200	362.1881	476.5081	-247.8681	14.0000	93.4000	25
Vinyl Chloride (µg/L)				<0.2		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Zn (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0
Field Data												
Temperature	27.8	22.6	14.6	4.7	0.8	10.8977	8.6675	19.5652	2.2302	9.3000	22.2000	26
pH	8.2	8.16	8.19	8.21	---[2]	8.2363	0.2989	8.5352	7.9373	8.1950	8.6290	24
Conductivity	565	574	683	667	---[2]	553.1250	102.0641	655.1891	451.0609	564.0000	678.2000	24
Dissolved Oxygen (mg/L)	9.03	8.1	8.97	12.42	4.49	11.3464	4.3739	15.7203	6.9725	11.8200	16.0000	25

	D	E	F	G	H	I	J	K	CZ	DA	DB	DC	DD	DE	DF	DG
1	Surface Water Station SWFD3				Regulated										Est'd.	Est'd
2	Estimated or Measu		Date Sampled:		Effluent				69	33	14	7.4	47	1.3	0	0
3	Effluent Discharge (r		Sample ID:		Parameter				0	0	0	0	0	0	0	0
4		SW3 is a backg			mg/L				1428327	1431585	1434218		1440942	1446257	B19-26597	B19-27095
5									SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3
6		Sample Date				PWQO (APV	CCME Surface	Environment BC	2019-05-23	2019-06-06	2019-06-19	2019-7-10	2019-07-12	2019-08-08	2019-8-23	2019-8-27
7	Analyte	PARAMETER	PWQO	MRL												
8	1,2-dichloroethane-d4 (%)								98	100						
9	1,4-dichlorobenzene (µg/L)					4			<0.4	<0.4					< 0.5	< 0.5
10	4-bromofluorobenzene (%)								91	115						
11	Ag (mg/L)	Silver	0.0001	0.0001					<0.0001	<0.0001	<0.0001		<0.0001	<0.0001		
12	Al (dissolved) (mg/L)	Al (dissolved)	0.075*	0.01					0.02	<0.01	0.01		0.02	<0.01		
13	Alkalinity as CaCO3	Alkalinity as CaCO3		5					167	171	179		159	198	156	388
14	As (mg/L)	Arsenic	0.1	0.001					<0.001	<0.001	<0.001		<0.001	<0.001		
15	B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.04	0.02	0.02		0.03	0.03	0.073	0.196
16	Ba (mg/L)	Barium		0.01					0.04	0.05	0.06		0.06	0.06	0.066	0.158
17	Benzene (µg/L)					100	ND/370	ND/40	<0.5	<0.5					< 0.5	< 0.5
18	Ca (mg/L)	Calcium		1					75	74	89		67	75	95	232
19	CBOD5 (mg/L)	Biochemical Oxygen Demand (		1	10.0				3	5	3		<1	1	< 3	< 3
20	Cd (mg/L)	Cadmium	0.0002	0.0001		0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	< 0.000070	< 0.000070
21	Cl (mg/L)	Chloride		1			640/120	600/150	19	24	28		40	36	27	491
22	Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	<0.0002	<0.0002	0.0002		<0.0002	0.0003		
23	COD (mg/L)	Chemical Oxygen Demand		5					56	42	39		33	32	58	47
24	Conductivity (µmho/c	Conductivity (µS/cm)		5					380	420	522		522	536	474	1960
25	Cr (mg/L)	Chromium (tota	0.0089**	0.001		0.0089	ND/.001		0.001	<0.001	<0.001		<0.001	0.002	0.002	0.002
26	Cu (mg/L)	Copper (mg/L)	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002	0.002		0.002	0.003	0.0031	0.0022
27	Dichloromethane (µg/L)					100	ND/9811		<4.0	<4.0					< 5	< 5
28	DOC (mg/L)	Dissolved Organic Carbon		0.5					17.4	16.7	15.3		15.2	14.5	14.2	18.6
29	Fe (mg/L)	Iron (mg/L)	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.26	0.28	0.37		0.24	0.35	0.897	0.758
30	Filtration								Y	Y	Y		Y	Y		
31	Hardness as CaCO3	Hardness as CaCO3		1					220	222	259		200	233	449	
32	Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	< 0.00002	0.00003
33	K (mg/L)	Potassium		1					2	1	2		2	3	4.6	9.8
34	Mg (mg/L)	Magnesium		1					8	9	9		8	11	15.7	38.7
35	Mn (mg/L)	Manganese		0.005					0.06	0.11	0.08		0.02	0.03	0.189	0.472
36	Na (mg/L)	Sodium		2		180			11	12	13		25	21	43.1	159
37	N-NH3 (mg/L)	N-NH3 (Ammonia) (mg/L)		0.02	1.0				0.02	0.044	0.05		0.02	0.03	0.19	1.07
38	N-NH3 (Unionized -	NH3 (un-ionize	0.02			0.0200								0.001198022		
39	N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10				0.6/0.2	<0.10	<0.10	<0.10		<0.10	<0.10	< 0.1	< 0.1
40	N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	2.22	1.99	4.07		3.38	<0.10	0.2	0.1
41	P - Total (mg/L)	Total Phosphor	0.03*	0.01	0.3	0.030			0.115	0.078	0.1		0.05	0.054	0.12	0.12
42	Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001		<0.001	<0.001	0.0003	0.0004
43	pH	pH (pH units)	6.5-8.5						8.33	8.19	8.1		8.14	8.61		
44	Phenols (mg/L)	Phenols (mg/L)	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001		<0.001	<0.001	< 0.002	< 0.002
45	Se (mg/L)	Selenium	0.1	0.001					<0.001	<0.001	<0.001		<0.001	<0.001		
46	SO4 (mg/L)	Sulphate		1				429	38	33	33		43	32	27	65
47	TDS (COND - CALC	TDS (COND - CALC)		5					247	273	339		339	348	308	1231
48	Toluene (µg/L)					0.8	ND/.002	ND/0.0005	<0.5	<0.5					< 0.5	< 0.5
49	Toluene-d8 (%)								97	102						
50	Total Kjeldahl Nitrog	Total Kjeldahl Nitrogen		0.10					1.1	1.09	1.21		1.13	0.95	1	2.5
51	Total P - Soluble (mg/L)								0.054	0.0762	0.076		0.032	0.025		
52	Total Suspended So	Total Suspended Solids (mg/L)		2	10.0				12	10	17		5	32	20	16
53	Vinyl Chloride (µg/L)					600			<0.2	<0.2					< 0.2	< 0.2
54	Zn (mg/L)	Zinc (mg/L)	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01		<0.01	<0.01	0.006	0.005
55												Field Measurements and flow only				
56	Chromium (mg/L)		0.0089													
57																
58																
59	**Field Data**	Field Data:														
60	Temperature	Temperature (ºC)							15.9	15.7	21.3	28	20.2	20.2	20.6	15.5
61	pH	pH (field) (pH u	6.5-8.5						8.67	7.86	7.87	9.21	7.78	8.02	6.69	7.31
62	Conductivity	Conductivity (field) (µS/cm)							362.9	481	531	403	553	590		
63	Dissolved Oxygen (r	Dissolved Oxygen (mg/L)			4				20.44	15.65	10.33	7.36	6.78	0.51		

	E	F	G	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT
1				Est'd.	Est'd.		Est'd.	Est'd.	Est'd.		Est'd.			Est'd.		
2		Date Sampled:		**3.3**	**9.2**	**2.5**	**3.1**	**1.6**	**0**	**12**	**17**	**41**	**41**	**28**	**19**	**49.22**
3		Sample ID:		**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4	SW3 is a backg			**B19-27537**	**B19-27824**		**B19-28281**	**B19-28725**	**1455464**	**1459459**	**B19-33323-3**	**B19-33766-3**	**1460890**	**B19-34301-3**	**B19-34716-3**	**B19-35135-3**
5				**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**
6	Sample Date			**2019-8-30**	**2019-9-3**	**2019-9-4**	**2019-9-6**	**2019-9-10**	**2019-09-23**	**2019-10-10**	**15-Oct-19**	**18-Oct-19**	**2019-10-18**	**22-Oct-19**	**25-Oct-19**	**29-Oct-19**
7	PARAMETER	PWQO	MRL													
8	4 (%)									95.7						
9	(µg/L)			< 0.5	< 0.5		< 0.5	< 0.5		<0.4	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
10	ne (%)									96						
11	Silver	0.0001	0.0001						<0.0001	<0.0001			<0.0001			
12	Al (dissolved)	0.075*	0.01						<0.01	<0.01			0.02			
13	Alkalinity as CaCO3		5	175	157		170	173	316	175	159	128	113	145	160	95
14	Arsenic	0.1	0.001						0.001	<0.001			<0.001			
15	Boron	0.2*	0.01	0.03	0.028		0.021	0.02	0.14	0.02	0.017	0.026	0.06	0.019	0.022	0.042
16	Barium		0.01	0.055	0.044		0.045	0.046	0.1	0.05	0.055	0.058	0.03	0.06	0.065	0.059
17				< 0.5	< 0.5		< 0.5	< 0.5		<0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
18	Calcium		1	79.3	69.6		68.8	79.9	147	86	71.1	76.1	71	73.7	83.9	76.9
19	Biochemical Oxygen Demand (		1	< 3	< 3		< 3	< 3	7	5	< 3	< 3	8	< 3	< 3	< 3
20	Cadmium	0.0002	0.0001	< 0.000070	< 0.000070		< 0.000070	< 0.000070	<0.0001	<0.0001	< 0.000070	< 0.000070	<0.0001	< 0.000070	< 0.000070	< 0.000070
21	Chloride		1	55.8	29.2		42.7	49.6	193	38	34	36.3	30	39.1	38.7	26
22	Cobalt	0.0009	0.0002						0.0005	<0.0002			<0.0002			
23	Chemical Oxygen Demand		5	40	41		25	18	49	22	24	53	37	22	34	34
24	Conductivity (µS/cm)		5	566	472		518	512	1270	532	507	527	526	526	547	436
25	Chromium (tota	0.0089**	0.001	< 0.001	0.001		< 0.001	0.002	<0.001	<0.001	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
26	Copper (mg/L)	0.005	0.001	0.0019	0.0021		0.0016	0.0024	0.002	0.001	0.0006	0.0017	0.002	0.001	0.002	0.0044
27	/L)			< 5	< 5		< 5	< 5		<4.0	< 5	< 5		< 5	< 5	< 5
28	Dissolved Organic Carbon		0.5	13.3	12.8		13.5	12.5	15	9.6	11.3	15.9	14.5	12.2	11.4	13.9
29	Iron (mg/L)	0.3	0.03	0.185	0.279		0.123	0.133	1.26	0.26	0.115	0.198	0.24	0.164	0.121	0.099
30									Y	Y			Y			
31	Hardness as CaCO3		1						466	256	218	226	214	225	251	234
32	Mercury	0.0002	0.0001	0.00003	0.00003		< 0.00002	< 0.00002	<0.0001	<0.0001	< 0.00002	< 0.00002	<0.0001	0.00002	0.00004	0.00005
33	Potassium		1	4.6	3.6		2.7	2.3	7	3	6.1	3.7	5	2.7	4.5	3
34	Magnesium		1	11.8	9.73		10.1	10.7	24	10	9.81	8.77	9	9.85	10.1	10.1
35	Manganese		0.005	0.023	0.037		0.008	0.012	0.51	0.03	0.004	0.005	<0.01	0.004	0.003	0.002
36	Sodium		2	23.7	14.5		18.7	17.9	86	20	15.8	23.1	20	23	19.8	17.1
37	N-NH3 (Ammonia) (mg/L)		0.02	0.08	0.04		0.03	0.02	0.54	0.03	0.03	0.05	0.051	0.03	0.03	0.04
38	NH3 (un-ionize	0.02							0.010288507	0.001241445	0.0006	0.0001	0.000585275	0.0008	0.0001	0.0003
39	N-NO2 (Nitrite)		0.10	< 0.1	< 0.1		< 0.1	< 0.1	<0.10	<0.10	< 0.1	< 0.1	<0.10	< 0.1	< 0.1	< 0.1
40	N-NO3 (Nitrate)		0.10	< 0.1	0.3		0.2	0.5	<0.10	0.8	0.8	4.3	4.43	1.5	1.7	4.4
41	Total Phosphor	0.03*	0.01	0.05	0.13		0.03	0.03	0.183	0.041	< 0.01	0.06	0.05	0.03	0.02	0.02
42	Lead	0.025	0.001	0.0001	0.0002		< 0.0001	0.0003	<0.001	<0.001	< 0.0001	0.0002	<0.001	< 0.0001	0.0001	< 0.0001
43	pH (pH units)	6.5-8.5							7.75	8.34			7.8			
44	Phenols (mg/L)	0.001	0.001	< 0.002	< 0.002		< 0.002	< 0.002	0.003	<0.001	< 0.002	< 0.002	<0.001	< 0.002	< 0.002	< 0.001
45	Selenium	0.1	0.001						<0.001	<0.001			<0.001			
46	Sulphate		1	55	38		41	52	66	46	57	64	86	57	64	63
47	TDS (COND - CALC)		5	336	261		287	319	311	346	299	324	342	299	324	272
48				< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
49										94						
50	Total Kjeldahl Nitrogen		0.10	0.8	0.8		0.7	0.7	1.6	1.14	0.5	1	1.59	0.6	0.6	1
51	g/L)								0.025	0.016			0.034			
52	Total Suspended Solids (mg/L)		2	8	11		4	6	201	10	< 3	4	7	< 3	17	< 3
53				< 0.2	< 0.2		< 0.2	< 0.2		<0.2	< 0.2	< 0.2		< 0.2	< 0.2	< 0.2
54	Zinc (mg/L)	0.03	0.01	0.006	< 0.005		< 0.005	0.005	<0.01	<0.01	0.017	0.006	<0.01	< 0.005	< 0.005	0.007
55						Field Measurements and flow only										
56		0.0089														
57																
58																
59	Field Data:															
60	Temperature (ºC)			17.8	16	18	15.3	10	18.3		7.3	8	8.7	9.5	8.7	8.1
61	pH (field) (pH u	6.5-8.5		7.41	7.45	7.88	7.41	7.32	meter failure		7.36	7.87	6.66	7.34	6.66	7.05
62	Conductivity (field) (µS/cm)					461			meter failure			553				
63	Dissolved Oxygen (mg/L)					6.1			2.1			10.27				

	E	F	G	DU	DV
1					
2		Date Sampled:		**43**	**100**
3		Sample ID:		**0**	**0**
4	SW3 is a backg			**B19-35418-3**	**1464890**
5				**SWFD3**	**SWFD3**
6	Sample Date			**31-Oct-19**	**2019-11-06**
7	PARAMETER	PWQO	MRL		
8	4 (%)				
9	(µg/L)			< 0.5	
10	ne (%)				
11	Silver	0.0001	0.0001		<0.0001
12	Al (dissolved)	0.075*	0.01		0.01
13	Alkalinity as CaCO3		5	144	138
14	Arsenic	0.1	0.001		<0.001
15	Boron	0.2*	0.01	0.027	0.07
16	Barium		0.01	0.065	0.05
17				< 0.5	
18	Calcium		1	84.7	92
19	Biochemical Oxygen Demand (		1	< 3	<1
20	Cadmium	0.0002	0.0001	< 0.000070	<0.0001
21	Chloride		1	32	27
22	Cobalt	0.0009	0.0002		<0.0002
23	Chemical Oxygen Demand		5	38	42
24	Conductivity (µS/cm)		5	559	583
25	Chromium (tota	0.0089**	0.001	< 0.001	<0.001
26	Copper (mg/L)	0.005	0.001	0.0031	0.001
27	/L)			< 5	
28	Dissolved Organic Carbon		0.5	15.1	17.1
29	Iron (mg/L)	0.3	0.03	0.061	0.1
30					Y
31	Hardness as CaCO3		1	256	275
32	Mercury	0.0002	0.0001	0.00003	<0.0001
33	Potassium		1	2.4	3
34	Magnesium		1	10.7	11
35	Manganese		0.005	0.002	<0.01
36	Sodium		2	16.7	15
37	N-NH3 (Ammonia) (mg/L)		0.02	0.05	<0.010
38	NH3 (un-ionize	0.02		0.001	NA
39	N-NO2 (Nitrite)		0.10	< 0.1	<0.10
40	N-NO3 (Nitrate)		0.10	3.4	7.72
41	Total Phosphor	0.03*	0.01	0.02	0.166
42	Lead	0.025	0.001	< 0.0001	<0.001
43	pH (pH units)	6.5-8.5			8.13
44	Phenols (mg/L)	0.001	0.001	< 0.002	<0.001
45	Selenium	0.1	0.001		<0.001
46	Sulphate		1	81	
47	TDS (COND - CALC)		5	329	
48				< 0.5	0.9
49					
50	Total Kjeldahl Nitrogen		0.10	0.8	1
51	g/L)				
52	Total Suspended Solids (mg/L)		2	4	< 3
53				< 0.2	< 0.2
54	Zinc (mg/L)	0.03	0.01	0.009	0.007
55					
56		0.0089			
57					
58					
59	Field Data:				
60	Temperature (ºC)			11.7	5.1
61	pH (field) (pH u	6.5-8.5		7.4	7.47
62	Conductivity (field) (µS/cm)				576
63	Dissolved Oxygen (mg/L)				12.4

	E	F	G	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI
1																
2		Date Sampled:		64	nil	2.4	246.3	143.9	15.9	9.8	22.7	92.3	11.7	25.29	52.37	48.88
3		Sample ID:		0												
4	SW3 is a backg			1471810	1475062	1480015	1485316	1487989	1492677	1493690	1507649	1508124	1513032	1521860	1526421	1533874
5				SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3	SWFD3
6	Sample Date			2019-12-11	2020-01-10	2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09
7	PARAMETER	PWQO	MRL													
8	4 (%)				88			106			110				88	
9	(µg/L)				<0.4			<0.4			<0.4				<0.4	
10	ne (%)				101			105			89				106	
11	Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
12	Al (dissolved)	0.075*	0.01	0.02	0.01	0.01	0.01	0.01	0.03	0.02	0.21	0.08	0.06	0.09	<0.01	0.01
13	Alkalinity as CaCO3		5	157	162	153	124	131	168	156	135	120	193	158	173	180
14	Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001
15	Boron	0.2*	0.01	0.04	0.02	0.02	0.03	0.03	0.03	0.02	0.07	0.11	0.03	0.04	0.03	0.04
16	Barium		0.01	0.05	0.05	0.04	0.03	0.05	0.04	0.04	0.06	0.05	0.06	0.05	0.04	0.04
17					<0.5			<0.5			<0.5				<0.5	
18	Calcium		1	85	91	78	61	65	72	68	68	70	79	73	88	98
19	Biochemical Oxygen Demand (		1	3	3	4	5	3	<1	3	7	3	4	9	3	3
20	Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Chloride		1	26	26	21	21	17	18	18	40	25	44	35	32	25
22	Cobalt	0.0009	0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0008	0.0002	<0.0002	0.0005	0.0003	0.0002	<0.0002	<0.0002	<0.0002
23	Chemical Oxygen Demand		5	35	34	27	49	53	39	30	55	37	28	29	30	45
24	Conductivity (µS/cm)		5	543	552	464	398	401	432	430	524	470	582	525	572	580
25	Chromium (tota	0.0089**	0.001	<0.001	0.002	<0.001	0.001	0.002	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001
26	Copper (mg/L)	0.005	0.001	0.002	0.002	0.001	0.002	0.003	0.001	0.001	0.004	0.005	0.002	0.002	0.001	0.002
27	/L)				<4.0			<4.0			<4.0				<4.0	
28	Dissolved Organic Carbon		0.5	15.3	12.2	12.6	11.4	15	16.1	15.3	19.5	19.4	12.3	12.7	12.1	16.3
29	Iron (mg/L)	0.3	0.03	0.17	0.23	0.28	0.6	1.25	0.4	0.3	0.84	0.37	0.35	0.27	0.12	0.16
30				Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
31	Hardness as CaCO3		1	253	268	232	177	191	217	199	199	212	238	219	265	290
32	Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
33	Potassium		1	2	2	1	1	1	2	1	3	3	2	5	2	2
34	Magnesium		1	10	10	9	6	7	9	7	7	9	10	9	11	11
35	Manganese		0.005	0.02	<0.01	0.04	0.04	0.23	0.09	0.08	0.03	0.03	0.03	0.02	0.01	0.02
36	Sodium		2	13	12	12	16	11	12	11	31	17	29	18	15	12
37	N-NH3 (Ammonia) (mg/L)		0.02	<0.010	0.02	0.059	0.142	0.132	0.05	<0.010	0.093	0.075	<0.05	<0.010	<0.010	<0.010
38	NH3 (un-ionize	0.02		NC	0.000472521	0.000224893	0.00095597	0.0013	0.00335598	NC	0.013976323	0.017842354	NC	N/A	N/A	N/A
39	N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
40	N-NO3 (Nitrate)		0.10	4.89	3.79	1.42	3.26	3.06	1.68	1.31		1.97	1.23	1.02	5.81	7.96
41	Total Phosphor	0.03*	0.01	0.084	0.036	0.024	0.171	0.184	0.075	0.023	0.095	0.104	0.075	0.046	0.017	0.133
42	Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
43	pH (pH units)	6.5-8.5		7.96	7.84	8.2	7.87	7.88	8.14	8.31	8.07	7.96	7.95	7.99	8.17	8.01
44	Phenols (mg/L)	0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	0.005	0.003	0.006	<0.001	<0.001
45	Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
46	Sulphate		1	77	75	60	36	36	39	38	62	66	40	54	59	72
47	TDS (COND - CALC)		5	353	359	302	259	261	281	280	341	306	378	341	372	377
48					<0.5			<0.5			<0.5				<0.5	
49					108			105			102				90	
50	Total Kjeldahl Nitrogen		0.10	0.9	1.32	0.907	1.62	2.75	1.14	1.09	1.86	1.4	0.9	1.04	0.855	1.39
51	g/L)			0.065	0.026	0.015	0.094	0.0923	0.045	0.011	0.03	<0.020	0.044	0.037	0.017	0.117
52	Total Suspended Solids (mg/L)		2	6	4	7	62	85	11	5	44	16	16	15	6	4
53					<0.2			<0.2			<0.2				<0.2	
54	Zinc (mg/L)	0.03	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
55																
56		0.0089														
57																
58																
59	Field Data:															
60	Temperature (ºC)			0.21	0.1	-0.2	0.3	7.1	5.2		23.66	21	15	9.9	1.07	0.1
61	pH (field) (pH u	6.5-8.5		8.32	8.47	7.68	7.91	7.83	8.75	8.28	8.54	8.87	6.38	8.78	9.11	7.95
62	Conductivity (field) (µS/cm)			532	517	87	365	396	440	420	493	547	571	509	522	538
63	Dissolved Oxygen (mg/L)			meter frozen	13.74	10.47	10.93	10.91	16.25	16.33	5.14	5.13	6.69	9.27	12.69	12.91

	E	F	G	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES
1													
2		Date Sampled:		**31**	**8**	**241**	**40**	**24**	**8**	**72**	**18**	**94**	**118**
3		Sample ID:											
4	SW3 is a backg			**1538401**	**1543599**	**1548373**	**1553601**	**1557476**	**1565642**	**1569102**	**1587666**	**1593967**	**1599822**
5				**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**	**SWFD3**
6	Sample Date			**2021-01-14**	**2021-02-25**	**2021-03-30**	**2021-04-23**	**2021-05-14**	**2021-06-28**	**2021-07-15**	**2021-10-05**	**2021-11-04**	**2021-12-03**
7	PARAMETER	PWQO	MRL										
8	4 (%)				127			118				93	
9	(µg/L)				<0.4			<0.4				<0.4	
10	ne (%)				83			84				85	
11	Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
12	Al (dissolved)	0.075*	0.01	0.01	<0.01	0.03	0.05	0.04	0.04	0.04	<0.01	<0.01	<0.01
13	Alkalinity as CaCO3		5	159	194	134	155	167	202	170	173	181	173
14	Arsenic	0.1	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001
15	Boron	0.2*	0.01	0.03	0.05	0.04	0.02	0.03	0.02	0.07	0.06	0.04	0.03
16	Barium		0.01	0.04	0.04	0.04	0.05	0.05	0.07	0.05	0.05	0.06	0.05
17					<0.5			<0.5				<0.5	
18	Calcium		1	81	85	69	70	86	84	81	83	109	101
19	Biochemical Oxygen Demand (		1	3	2	3	<1	<1	2	1	2	<1	2
20	Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
21	Chloride		1	23	24	24	21	22	39	37	40	30	30
22	Cobalt	0.0009	0.0002	<0.0002	<0.0002	0.0007	0.0005	0.0003	0.0003	<0.0002	<0.0002	<0.0002	<0.0002
23	Chemical Oxygen Demand		5	30	29	66	46	45	25	46	40	5	34
24	Conductivity (µS/cm)		5	493	514	446	450	452	533	545	603	653	604
25	Chromium (tota	0.0089**	0.001	<0.001	<0.001	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Copper (mg/L)	0.005	0.001	0.001	0.001	0.005	0.002	0.002	0.002	0.003	0.002	0.001	0.001
27	/L)				<4.0			<4.0				<4.0	
28	Dissolved Organic Carbon		0.5	13.8	9.7	17	17.1	20.8	13	16.2	18	16.3	11.5
29	Iron (mg/L)	0.3	0.03	0.27	0.21	0.82	0.89	0.52	0.46	0.29	0.1	0.12	0.14
30				Y	Y	Y	Y	Y	Y	y	y	y	Y
31	Hardness as CaCO3		1	243	258	205	208	256	251	243	253	330	302
32	Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
33	Potassium		1	1	2	2	2	2	2	3	6	3	3
34	Magnesium		1	10	11	8	8	10	10	10	11	14	12
35	Manganese		0.005	0.01	0.04	0.07	0.2	0.14	0.11	0.02	0.01	<0.01	<0.01
36	Sodium		2	13	14	12	12	15	25	22	22	16	15
37	N-NH3 (Ammonia) (mg/L)		0.02	0.018	0.066	0.282	<0.010	0.011	0.011	<0.010	<0.010	0.013	<0.010
38	NH3 (un-ionize	0.02		0.000173762	0.001032256	0.005761516	NC	0.001544834	0.001939178	NC	NC	7.41553E-06	NC
39	N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
40	N-NO3 (Nitrate)		0.10	3.3	2.97	5.48	2.03	1.62	1.09	5.24	2.32	10.2	10.6
41	Total Phosphor	0.03*	0.01	0.026	0.022	0.32	0.148	0.054	0.108	0.094	0.413	0.147	0.083
42	Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
43	pH (pH units)	6.5-8.5		8.07	8.08	7.69	8.13	8.13	8	8.01	8	7.83	7.91
44	Phenols (mg/L)	0.001	0.001	<0.001	<0.001	0.002	<0.0050	<0.0010	<0.001	<0.004	0.002	<0.001	0.001
45	Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
46	Sulphate		1	54	45	40	37	37	28	47	63	68	57
47	TDS (COND - CALC)		5	320	334	290	292	294	346	354	392	424	393
48					<0.5			<0.5				<0.5	
49					101			114				83	
50	Total Kjeldahl Nitrogen		0.10	1.08	0.845	2.12	1.67	1.39	1.35	1.38	1.26	1.37	1.06
51	g/L)			0.016	0.012	0.271	0.052	0.029	0.058	0.076	0.413	0.135	0.07
52	Total Suspended Solids (mg/L)		2	2	4	188	44	21		10	3	5	3
53					<0.2			<0.2				<0.2	
54	Zinc (mg/L)	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
55													
56		0.0089											
57													
58													
59	Field Data:												
60	Temperature (°C)			0.24	0.3	9	14	21.28	31.7	28.1	18.6	2.1	0.9
61	pH (field) (pH u	6.5-8.5		NA [7]	8.28	8.09	8.27	8.58	8.38	8.33	8.23	6.77	---[2]
62	Conductivity (field) (µS/cm)			NA [7]	466	391	395	450	531	563	596	661	---[2]
63	Dissolved Oxygen (mg/L)			12.78	9.65	11.6	11.91	10.71	4.01	7.4	8.73	12.37	14.57

	E	F	G	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ
1					Statistics - Grp. B Upstream of Discharge - Background from May 23, 2019								
2		Date Sampled:			May 23, 2019 to December 3, 2021								
3		Sample ID:			CZ to ES								
4	SW3 is a backg												
5												Objective / Guideline	Count > Objective
6	Sample Date												
7	PARAMETER	PWQO	MRL		MEAN	Standard	+ SD	- SD	Grp. B Median	Grp. B 90th %	N		
8	4 (%)				102.37	12.88	12.88	89.49	99.00	118.90	10.00		
9	(µg/L)				#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0.00		
10	ıe (%)				95.50	10.92	10.92	84.58	93.50	106.90	10.00		
11	Silver	0.0001	0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		
12	Al (dissolved)	0.075*	0.01		0.04	0.04	0.04	-0.01	0.02	0.08	23		
13	Alkalinity as CaCO3		5		168	47	206	121	161	194	44		
14	Arsenic	0.1	0.001		0.001	0.000	0.000	0.001	0.001	0.001	7		
15	Boron	0.2*	0.01		0.042	0.034	0.051	0.008	0.030	0.070	44.000	1.200	0.000
16	Barium		0.01		0.05	0.02	0.08	0.03	0.05	0.07	44		
17					#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		
18	Calcium		1		84	27	98	57	79	97	44		
19	Biochemical Oxygen Demand (		1		4	2	#VALUE!	2	3	7	26		
20	Cadmium	0.0002	0.0001		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		
21	Chloride		1		44.9	73.6	107.6	-28.7	30.0	43.6	44.0	120.0	2.0
22	Cobalt	0.0009	0.0002		0.0004	0.0002	0.0002	0.0002	0.0003	0.0007	13		
23	Chemical Oxygen Demand		5		37	12	36	25	37	53	44		
24	Conductivity (µS/cm)		5		560	252	759	309	525	597	44		
25	Chromium (tota	0.0089**	0.001		0.002	0.000	#VALUE!	0.001	0.002	0.002	13		
26	Copper (mg/L)	0.005	0.001		0.0021	0.0010	0.0016	0.0010	0.0020	0.0031	44.0000	0.0020	12.0000
27	/L)				#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		
28	Dissolved Organic Carbon		0.5		15	3	14	12	15	18	44		
29	Iron (mg/L)	0.3	0.03		0.356	0.299	0.414	0.056	0.265	0.834	44.000	0.300	15.000
30					#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		
31	Hardness as CaCO3		1		249	58	276	191	238	292	39		
32	Mercury	0.0002	0.0001		0.0000	0.0000	#VALUE!	0.0000	0.0000	0.0000	7		
33	Potassium		1		3	2	8	1	3	5	44		
34	Magnesium		1		11	5	15	6	10	12	44		
35	Manganese		0.005		0.073	0.114	0.118	-0.041	0.030	0.191	39		
36	Sodium		2		23	24	40	-2	16	28	44	180	0
37	N-NH3 (Ammonia) (mg/L)		0.02		0.104	0.201	0.231	-0.097	0.044	0.180	33.000	NA	
38	NH3 (un-ionize	0.02			0.0028	0.0048	0.0054	-0.0019	0.0010	0.0094	23	0.020	0
39	N-NO2 (Nitrite)		0.10		#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		
40	N-NO3 (Nitrate)		0.10		3.11	2.59	3.39	0.52	2.27	6.00	40	3	18
41	Total Phosphor	0.03*	0.01	52.000	0.092	0.079	#VALUE!	0.012	0.075	0.170	43.000	0.030	32.000
42	Lead	0.025	0.001		0.000	0.000	#VALUE!	0.000	0.000	0.000	7		
43	pH (pH units)	6.5-8.5			8.05	0.19	0.19	7.86	8.04	8.30	32		
44	Phenols (mg/L)	0.001	0.001		0.003	0.002	#VALUE!	0.002	0.003	0.005	9		
45	Selenium	0.1	0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0		
46	Sulphate		1		52	15	72	37	54	71	43	429	0
47	TDS (COND - CALC)		5		344	144	443	200	324	378	43		
48					1	#DIV/0!	#VALUE!	#DIV/0!	1	1	1		
49					100	9	9	91	102	109	10		
50	Total Kjeldahl Nitrogen		0.10		1.19	0.47	0.97	0.73	1.09	1.66	44		
51	g/L)				0.068783333	0.08289593	0.08289593	-0.014112597	0.0445	0.1188	30		
52	Total Suspended Solids (mg/L)		2		24	44	#VALUE!	-19	10	48	39		
53					#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#NUM!	#NUM!	0		
54	Zinc (mg/L)	0.03	0.01		0.01	0.00	0.02	0.00	0.01	0.01	9		
55													
56		0.0089											
57													
58													
59	Field Data:												
60	Temperature (ºC)				12.04	8.73	16.03	3.31	10.85	21.29	44		
61	pH (field) (pH u	6.5-8.5			7.9	0.7	8.1	7.2	7.9	8.7	42		
62	Conductivity (field) (µS/cm)				483.36	106.53	106.53	376.84	513.00	577.40	30		
63	Dissolved Oxygen (mg/L)				10	4	4	6	11	16	32		

face Water Station SWFD4		LAB ID:		Reglated									
	Estimated Stream Flow (L/sec)			Effluent				**38.00**	**37.00**	**27.00**	**39.00**	**4.30**	**7.40**
		Sample ID:		Parameter				0.00	0.00	0.00	0.00	0.00	0.00
				mg/L				**1428329.00**	**1431584.00**	**1434215.00**	**1440941.00**	**1446256.00**	
								SW4	**SWFD4**	**SWFD4**	**SWFD4**	**SWDF4**	**SWFD4**
	Sample Date				**PWQO (APV for Cl and Na)**	**CCME Surface Water Quality Guideline -**	**Environment BC Surface Water Quality Guideline -**	2019-05-23	2019-06-06	2019-06-19	2019-07-12	2019-08-08	2019-9-4
Analyte	PARAMETER	PWQO	MRL										
,2-dichloroethane-d4 (%)								94	105				
4-dichlorobenzene (µg/L)					4			<0.4	<0.4				
-bromofluorobenzene (%)								91	114				
Ag (mg/L)	Silver	0.0001	0.0001					<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Al (dissolved) (mg/L)	Al (dissolved)	0.075*	0.01					0.02	<0.01	<0.01	0.02	<0.01	
kalinity as CaCO3 (mg/	kalinity as CaCO3		5					145	160	182	169	198	
As (mg/L)	Arsenic	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.02	0.01	0.01	0.02	0.02	
Ba (mg/L)	Barium		0.01					0.04	0.05	0.06	0.07	0.07	
Benzene (µg/L)					100	ND/370	ND/40	<0.5	<0.5				
Ca (mg/L)	Calcium		1					70	70	84	67	78	
CBOD5 (mg/L)	emical Oxygen Demand		1	10.0				5	4	3	<1	5	
Cd (mg/L)	Cadmium	0.0002*	0.0001		0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cl (mg/L)	Chloride		1			640/120	600/150	20	25	30	39	35	
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	
COD (mg/L)	ical Oxygen Demand		5					38	33	24	31	28	
Conductivity (µmho/cm)	nductivity (µS/cm)		5					370	410	509	513	542	
Cr (mg/L)	Chromium (total)	0.0089**	0.001		0.0089	ND/.001		0.001	<0.001	<0.001	<0.001	0.002	
Cu (mg/L)	Copper	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.001	<0.001	0.001	0.002	0.002	
Dichloromethane (µg/L)					100	ND/9811		<4.0	<4.0				
DOC (mg/L)	lved Organic Carbon		0.50					14.8	14	13.2	13.8	12.7	
Fe (mg/L)	Iron	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.31	0.29	0.25	0.3	0.32	
Filtration								Y	Y	Y	Y	Y	
ardness as CaCO3 (mg	ardness as CaCO3		1					204	208	247	200	236	
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
K (mg/L)	Potassium		1					1	1	1	2	2	
Mg (mg/L)	Magnesium		1					7	8	9	8	10	
Mn (mg/L)	Manganese		0.01					0.06	0.07	0.06	0.05	0.07	
Na (mg/L)	Sodium		2		180			10	12	12	25	21	
N-NH3 (mg/L)	N-NH3 (Ammonia)		0.02	1.0				0.02	0.042	0.03	0.04	0.031	
(Unionized - calculated)	un-ionized Ammonia[a])	0.02			0.0200							0.001309182	
N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10				0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10	
N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	2.49	2.08	3.82	3.24	0.96	
P - Total (mg/L)	Total Phosphorus	0.03*	0.01	0.3	0.030			0.091	0.029	0.034	0.06	0.065	
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001	
pH	pH (pH units)	6.5-8.5						8.14	8.15	8.13	8.26	8.71	
Phenols (mg/L)	Phenols	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001	<0.001	<0.001	
Se (mg/L)	Selenium	0.1	0.001					<0.001	<0.001	<0.001	<0.001	<0.001	
SO4 (mg/L)	Sulphate		1				429	31	31	31	41	35	
DS (COND - CALC) (mg	S (COND - CALC)		5					240	266	331	333	352	
Toluene (µg/L)					0.8	ND/.002	ND/0.0005	<0.5	<0.5				
Toluene-d8 (%)								96	104				
al Kjeldahl Nitrogen (mg	al Kjeldahl Nitrogen		0.10					1.3	6.24	1.12	1.05	0.87	
Total P - Soluble (mg/L)								0.042	0.0206	0.024	0.039	0.046	
al Suspended Solids (m	tal Suspended Solids		2	10.0				7	3	9	7	3	
Vinyl Chloride					600			<0.2	<0.2				
Zn (mg/L)	Zinc	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01	<0.01	<0.01	
													Field Measurem
Field Data	**Field Data:**												
Temperature	emperature (ºC)							13.8	12.1	15.4			17
pH	H (field) (pH units)	6.5-8.5						8.11	7.77	7.45	7.97		7.97
Conductivity	uctivity (field) (µS/cm)							300	468	525	545		427
Dissolved Oxygen (mg/L	Dissolved Oxygen			4.00				13.2	14	10.43	8.63		6.8

-D4		LAB ID:												
	Estimated Stream Flow (L/sec)			**3.90**	**6.70**	**31.00**	**54.00**	**509.00**	11.09	0.93	242.29	120.10	19.97	12.90	13.04
		Sample ID:		0.00	0.00	0.00	0.00	0.00							
				1455463.00	**1459458.00**	**1460889.00**	**1464889.00**	**1471800.00**	**1475063.00**	**1480017.00**	**1485319.00**	**1487992.00**	**1492679.00**	**1493691.00**	**1507650.00**
				SWFD4	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**
Sample Date				2019-09-23	2019-10-10	2019-10-18	2019-11-06	2019-12-11	2020-01-10	2020-02-14	2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30
PARAMETER		PWQO	MRL												
)					95.7				95			105			110
-)					<0.4				<0.4			<0.4			<0.4
%)					98				101			106			90
Silver		0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved)		0.075*	0.01	<0.01	<0.01	0.01	0.02	0.02	0.06	<0.01	0.02	0.02	0.02	0.02	0.07
kalinity as CaCO3			5	173	176	135	147	142	167	152	114	124	146	146	154
Arsenic		0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron		0.2*	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02
Barium			0.01	0.08	0.06	0.04	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.08
					<0.5				<0.5			<0.5			<0.5
Calcium			1	77	83	72	88	79	87	77	53	61	67	65	70
emical Oxygen Demand			1	4	4	5	<1	3	2	5	6	2	2	4	6
Cadmium		0.0002*	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride			1	31	34	31	31	24	25	21	21	19	19	19	37
Cobalt		0.0009	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0005
ical Oxygen Demand			5	37	17	42	32	28	34	25	27	28	30	30	41
nductivity (µS/cm)			5	507	509	504	559	506	529	463	348	376	407	414	499
Chromium (total)		0.0089**	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Copper		0.005	0.001	0.001	<0.001	0.001	0.001	0.001	0.001	<0.001	0.001	0.001	<0.001	<0.001	0.005
					<4.0				<4.0			<4.0			<4.0
lved Organic Carbon			0.50	11.5	9.2	12.2	12.5	12.5	11.2	11.4	9.1	12.8	13.5	13.2	16.8
Iron		0.3	0.03	0.25	0.12	0.21	0.18	0.19	0.3	0.39	0.42	0.24	0.32	0.31	0.91
				Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
rdness as CaCO3			1	233	248	213	261	234	258	229	153	177	200	191	204
Mercury		0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium			1	5	2	2	2	1	1	1	1	1	1	1	2
Magnesium			1	10	10	8	10	9	10	9	5	6	8	7	7
Manganese			0.01	0.07	0.01	0.02	0.04	0.06	0.09	0.13	0.08	0.04	0.08	0.07	0.16
Sodium			2	14	18	19	16	12	12	12	15	10	11	11	25
N-NH3 (Ammonia)			0.02	0.06	0.025	0.023	<0.010	0.541	0.015	0.048	0.107	0.011	<0.010	<0.010	<0.010
un-ionized Ammonia[a])		0.02		0.002853029	0.001168662	0.000239641	NA	0.005553349	0.000170312	0.000678434	0.001125639	0.0001	NC	NC	NC
N-NO2 (Nitrite)			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			0.10	0.54	1.32	1.97	6.15	4.31	3.31	1.25	2.46	2.88	1.76	1.54	0.63
Total Phosphorus		0.03*	0.01	0.05	0.018	0.029	0.016	0.017	0.019	0.026	0.083	0.026	0.019	0.02	0.102
Lead		0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)		6.5-8.5		8.16	8.35	7.86	8.28	7.95	7.87	8.17	7.9	7.96	8.15	8.3	8.1
Phenols		0.001	0.001	0.005	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.003	<0.001	<0.001	0.004	0.003
Selenium		0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate			1	39	44	64	66	71	72	59	25	26	36	37	46
S (COND - CALC)			5	330	331	328	363	329	344	301	226	244	265	269	324
					<0.5				<0.5			<0.5			<0.5
					95				105			104			100
al Kjeldahl Nitrogen			0.10	0.8	0.62	0.69	0.98	0.6	1.04	0.871	1.31	1.48	0.792	0.929	1.31
				0.013	0.012	0.018	0.014	0.012	0.005	0.013	0.017	0.0139	0.011	0.01	0.03
al Suspended Solids			2	3	<2	5	4	3	18	12	53	6	26	10	52
					<0.2				<0.2			<0.2			<0.2
Zinc		0.03	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
				hents and flow only											
Field Data:															
emperature (°C)				18.3		8.8	6.4	0.43	0	-0.1	1	7.4	4.8	10.4	21.77
H (field) (pH units)		6.5-8.5		metre failure		7.8	7.28	8.09	8.15	8.25	8.08	7.61	8.61	8.33	8.65
uctivity (field) (µS/cm)				metre failure		516	565	243	527	267	331	363	415	404	472
Dissolved Oxygen				5.01		9.15	10.47	11.21	11.99	14.42	11.02	12.41	12	15.44	5.78

-D4		LAB ID:												
	Estimated Stream Flow (L/sec)			65.20	8.26	50.53	38.23	30.14	19.00	6.00	133.00	36.00	28.00	5.00	19.00
		Sample ID:													
				1508125.00	**1513033.00**	**1521861.00**	**1526422.00**	**1533876.00**	**1538403.00**	**1543601.00**	**1548375.00**	**1553603.00**	**1557474.00**	**1565643.00**	**1569104.00**
				SWFD4	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**	**SWFD4**
Sample Date				2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09	2021-01-14	2021-02-25	2021-03-30	2021-04-23	2021-05-14	2021-06-28	2021-07-15
PARAMETER		PWQO	MRL												
)							90			130			114		
–)							<0.4			<0.4			<0.4		
%)							105			88			86		
Silver		0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved)		0.075*	0.01	0.12	0.02	0.07	0.01	0.01	0.01	0.01	0.04	0.02	0.03	0.02	0.03
kalinity as CaCO3			5	164	180	192	177	163	154	171	132	149	151	197	192
Arsenic		0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron		0.2*	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.03
Barium			0.01	0.08	0.07	0.07	0.05	0.05	0.05	0.06	0.04	0.05	0.05	0.08	0.08
							<0.5			<0.5			<0.5		
Calcium			1	80	76	82	87	90	79	82	68	66	81	84	84
emical Oxygen Demand			1	3	5	6	3	3	2	2	2	<1	<1	2	<1
Cadmium		0.0002*	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride			1	34	40	24		27	24	23	30	22	23	40	42
Cobalt		0.0009	0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003
ical Oxygen Demand			5	30	27	27	27	37	25	26	32	34	40	<5	33
nductivity (µS/cm)			5	520	546	517	559	538	474	481	451	431	426	538	584
Chromium (total)		0.0089**	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper		0.005	0.001	0.002	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.002	
							<4.0			<4.0			<4.0		
lved Organic Carbon			0.50	14.5	11.3	11.7	12.5	12.6	12.7	9.9	12.4		18.2	11.2	11
Iron		0.3	0.03	0.67	0.27	0.32	0.2	0.26	0.48	0.37	0.29	0.27	0.27	0.24	0.55
				Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	y
rdness as CaCO3			1	237	227	242	258	266	238	246	199	198	243	251	251
Mercury		0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium			1	3	2	4	2	1	1	2	2	1	2	2	2
Magnesium			1	9	9	9	10	10	10	10	7	8	10	10	10
Manganese			0.01	0.08	0.05	0.08	0.06	0.08	0.11	0.17	0.05	0.1	0.08	0.05	0.13
Sodium			2	17	26	11	15	11	13	12	14	11	16	26	24
N-NH3 (Ammonia)			0.02	0.143	0.05	<0.010	<0.010	<0.010	0.017	0.037	<0.010	<0.010	<0.010	<0.010	<0.010
un-ionized Ammonia[8])		0.02		0.023986519	0.003152058	N/A	N/A	N/A	0.000202177	0.000923876	NC	NC	NC	NC	NC
N-NO2 (Nitrite)			0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			0.10	2.41	1.52	1.63	4.15	7.19	2.9	2.46	6.96		1.95	2.48	5.73
Total Phosphorus		0.03*	0.01	0.085	0.05	0.039	0.014	0.015	0.038	0.03	0.033	0.02	0.062	0.048	
Lead		0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)		6.5-8.5		8.08	8.23	8.07	8.13	8.23	8.17	8.14	7.72	8.09	8.29	8.05	7.85
Phenols		0.001	0.001	0.005	0.003	0.007	<0.001	<0.001	<0.001	<0.001	0.001	<0.0010	<0.0010	<0.001	0.002
Selenium		0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate			1	45	40	36	58	57	48	41	28	31	33	27	36
S (COND - CALC)			5	338	355	336	363	350	308	313	293	280	277	350	380
							<0.5			<0.5			<0.5		
							91			104			115		
al Kjeldahl Nitrogen			0.10	1.39	<0.8	0.719	1.56	1.14	0.897	0.972	1.01	1.02	1.11	0.999	1.01
				<0.020	0.025	0.036	0.01	0.014	0.011	0.011	0.023	0.013	0.01	0.034	0.022
al Suspended Solids			2	120	9	8	4	5	14	9	26	4	33	4	89
							<0.2			<0.2			<0.2		
Zinc		0.03	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
Field Data:															
emperature (ºC)				18.8	14	10.1	3.01	1.6	0.01	0.5	6.3	10.2	17.92	25.5	21.4
H (field) (pH units)		6.5-8.5		8.75	8.43	8.74	9.17	7.83	NA [7]	8.48	7.94	8.43	8.71	8.27	8.3
uctivity (field) (µS/cm)				496	545	495	503	509	NA [7]	430	400	386	418	538	584
Dissolved Oxygen				6.35	9.02	9.84	11.24	13.63	14.99	13.68	11.04	12.33	12.21	6.57	7.4

-D4		LAB ID:						Statistics Grp B Upstream Background						
	Estimated Stream Flow (L/sec)			18.00	43.00	72.00		**2019-5-23 to 2021-12-03**						
		Sample ID:						CR to DM						
				1587668	**1593971.00**	**1599824.00**								
				SWFD4	**SWFD4**	**SWFD4**								
Sample Date				2021-10-05	2021-11-05	2021-12-03		MEAN	Standard Deviation	+ SD	- SD	Median	90th %	N
PARAMETER		PWQO	MRL									Grp B	Grp B	
)					91			102.97	11.91	-91.06	91.06	100.35	115.60	10.00
–)					<0.4			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
%)					84			96.30	9.50	-86.80	86.80	94.50	106.80	10.00
Silver		0.0001	0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Al (dissolved)		0.075*	0.01	<0.01	<0.01	0.01		0.03	0.03	0.00	0.00	0.02	0.07	24.00
kalinity as CaCO3			5	186	178	176		162.25	20.99	-141.26	141.26	163.50	191.40	32.00
Arsenic		0.1	0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Boron		0.2*	0.01	0.03	0.02	0.01		0.018	0.006	-0.012	0.012	0.020	0.020	32.000
Barium			0.01	0.07	0.07	0.06		0.06	0.01	-0.04	0.04	0.06	0.08	32.00
					<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Calcium			1	103		102		77.81	10.76	-67.05	67.05	79.00	88.00	31.00
emical Oxygen Demand			1	2	2	1		3.44	1.47	-1.97	1.97	3.00	5.40	27.00
Cadmium		0.0002*	0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Chloride			1	83	31	34		30.258	11.794	-18.464	18.464	30.000	40.000	31.000
Cobalt		0.0009	0.0002	<0.0002	<0.0002	<0.0002		0.0003	0.0001	-0.0002	0.0002	0.0003	0.0005	6.0000
ical Oxygen Demand			5	18	39			30.67	6.10	-24.57	24.57	30.00	39.10	30.00
nductivity (µS/cm)			5	601	635	623		496.53	70.82	-425.71	425.71	508.00	581.50	32.00
Chromium (total)		0.0089**	0.001	<0.001	<0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	4.00
Copper		0.005	0.001	0.001	0.001	0.001		0.0014	0.0009	-0.0005	0.0005	0.0010	0.0020	20.0000
					<4.0			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
lved Organic Carbon			0.50	11.3	13.5	10.3		12.50	1.91	-10.59	10.59	12.50	14.50	31.00
Iron		0.3	0.03	0.19	0.32	0.25		0.321	0.151	-0.170	0.170	0.290	0.474	32.000
				y		Y		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
rdness as CaCO3			1		311	304		231.19	33.23	-197.96	197.96	236.00	261.00	31.00
Mercury		0.0002	0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Potassium			1	3	2	2		1.81	0.92	-0.90	0.90	2.00	2.90	32.00
Magnesium			1	11	13	12		9.03	1.65	-7.38	7.38	9.00	10.00	32.00
Manganese			0.01	0.03	0.07	0.05		0.07	0.04	-0.04	0.04	0.07	0.13	32.00
Sodium			2	22	15	15		15.72	5.04	-10.68	10.68	14.50	24.90	32.00
N-NH3 (Ammonia)			0.02	<0.010	<0.010	<0.010		0.073	0.122	0.049	-0.049	0.037	0.121	17.000
un-ionized Ammonia[a])		0.02		NC	N/A	NC		0.0032	0.0062	0.0030	-0.0030	0.0011	0.0051	13.0000
N-NO2 (Nitrite)			0.10	<0.10	<0.10	1.736		1.74	0.00	-1.74	1.74	1.74	1.74	1.00
N-NO3 (Nitrate)			0.10	3.32	9.4	11.9		3.378	2.567	-0.811	0.811	2.480	6.960	31.000
Total Phosphorus		0.03*	0.01	0.025	0.025	0.019		0.039	0.024	-0.015	0.015	0.029	0.083	31.000
Lead		0.025	0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
pH (pH units)		6.5-8.5		8.04	7.97	7.9		8.11	0.18	-7.92	7.92	8.13	8.29	32.00
Phenols		0.001	0.001	0.002	0.001	<0.001		0.0032	0.0017	-0.0014	0.0014	0.0030	0.0050	12.0000
Selenium		0.1	0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Sulphate			1	46	62	52		43.56	13.47	-30.10	30.10	40.50	63.80	32.00
S (COND - CALC)			5	391	413	405		322.75	46.14	-276.61	276.61	330.50	378.30	32.00
					<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
					82			99.60	8.62	-90.98	90.98	102.00	106.00	10.00
al Kjeldahl Nitrogen			0.10	1.02	1.37	0.889		1.20	0.95	-0.25	0.25	1.01	1.39	31.00
				0.018	0.026	0.011		0.02	0.01	-0.01	0.01	0.01	0.04	31.00
al Suspended Solids			2	<2	6	7		18.63	26.65	8.01	-8.01	7.50	52.10	30.00
					<0.2			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zinc		0.03	0.01	<0.01	<0.01	<0.01		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Field Data:														
emperature (°C)				15.5	4.3	0.3		9.56	7.59	-1.97	1.97	9.45	19.06	28.00
H (field) (pH units)		6.5-8.5		8.18	8.64	---[2]		8.21	0.42	-7.79	7.79	8.22	8.72	28.00
uctivity (field) (µS/cm)				592	628	---[2]		460.43	97.36	-363.07	363.07	483.50	570.70	28.00
Dissolved Oxygen				9.14	11.94	15.27		10.86	2.86	-7.99	7.99	11.21	14.42	31.00

Surface Water Station SWLTD1															
Measured / Estimated Flow (L/sec) (including effluent discharge)					CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)	294.32	62.07	27.90	5.96	43.37	98.63	8.66	15.73	24.55
			LIMS #				1485322.00	1487995.00	1492682.00	1493694.00	1507648.00	1508123.00	1513031.00	1521859.00	1526420.00
			Sample ID				SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1	SWLTD-1
			Sample Date				2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03
Analyte	Units	Analytical Method	MRL	PWQO (APV for Cl and Na)											
2-dichloroethane-d4 (%)								106.00			107.00				89.00
-dichlorobenzene (µg/L)				4.00				<0.4			<0.4				<0.4
promofluorobenzene (%)								105.00			90.00				107.00
Ag (mg/L)	mg/L	EPA 200.8	0.00				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	EPA 200.8	0.01				0.02	<0.01	0.02	0.03	0.27	0.12	0.04	0.15	<0.01
alinity as CaCO3 (mg	mg/L	2320,2510,4500	5.00				118	206	240	203	206	244	291	296	255
As (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
B (mg/L)	mg/L	EPA 200.8	0.010	0.2*	29/1.5	ND/1.2	0.03	0.04	0.03	0.02	0.06	0.05	0.07	0.06	0.04
Ba (mg/L)	mg/L	EPA 200.8	0.01				0.04	0.08	0.07	0.07	0.07	0.07	0.1	0.09	0.07
Benzene (µg/L)				100.00	ND/370	ND/40		<0.5			<0.5				<0.5
Ca (mg/L)	mg/L	SM3120B-3500	1.00				59	100	102	84	87	107	114	118	112
CBOD5 (mg/L)	mg/L	SM 5210B	1.00				6	1	2	3	8	4	4	6	3
Cd (mg/L)	mg/L	EPA 200.8	0.00	0.00	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	SM 4110	1.00		640/120	600/150	29	42	69	80	92	56	100	80	56
Co (mg/L)	mg/L	EPA 200.8	0.00			0.110/0.004	0.0005	0.0016	0.0003	0.0003	0.0003	<0.0002	0.0003	0.0002	0.0002
COD (mg/L)	mg/L	C SM5220D	5.00				71	49	21	18	30	20	48	15	18
onductivity (µmho/cm	uS/cm	2320,2510,4500	5.00				410	649	718	711	807	762	991	898	787
Cr (mg/L)	mg/L	EPA 200.8	0.00	0.01	ND/.001		0.002	0.005	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Cu (mg/L)	mg/L	EPA 200.8	0.0010		ND/.004	0.029/≤0.002	0.003	0.006	0.002	0.003	0.005	0.003	0.002	0.002	0.002
ichloromethane (µg/L)				100.00	ND/9811			<4.0			<4.0				<4.0
DOC (mg/L)	mg/L	SM 5310B	0.50				10.7	10.7	7.6	6.6	15.5	11.5	17.3	6.3	9.1
Fe (mg/L)	mg/L	EPA 200.8	0.030	0.300	ND/0.3	0.001/ND	0.67	2.1	0.38	0.31	0.52	0.23	0.38	0.31	0.29
Filtration		EPA 200.8					Y		Y	Y	Y	Y	Y	Y	Y
rdness as CaCO3 (mg	mg/L	C SM2340B	1.00				168	291	308	251	254	312	338	356	333
Hg (mg/L)	mg/L	EPA 200.8	0.00	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	SM3120B-3500	1.00				2	3	3	2	5	4	9	4	4
Mg (mg/L)	mg/L	SM3120B-3500	1.00				5	10	13	10	9	11	13	15	13
Mn (mg/L)	mg/L	EPA 200.8	0.01				0.09	0.26	0.08	0.07	0.14	0.01	0.07	0.09	0.04
Na (mg/L)	mg/L	SM3120B-3500	2.00	180.00			20	21	39	40	65	39	73	46	35
N-NH3 (mg/L)	mg/L	EPA 350.1	0.010				0.262	0.087	<0.010	0.038	0.064	0.092	0.73	0.035	0.055
Unionized - calculated) (mg/L)				0.020			0.001873347	0.0009	NC	0.001616384	0.00456026	0.011570912	0.02504935	0.002504335	0.001327981
N-NO2 (mg/L)	mg/L	SM 4110	0.10			0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	<0.10
N-NO3 (mg/L)	mg/L	SM4500-NO3-	0.10		124/3.0	32.8/3.0	3.84	7.03	3.93	2.67	8.61	7.21	1.34	2.01	7.75
P - Total (mg/L)	mg/L	EPA 200.8	0.00	0.03			0.248	0.227	0.066	0.055	0.387	0.239	0.76	0.091	0.122
Pb (mg/L)	mg/L	EPA 200.8	0.00	0.03	ND/.007	0.003/ND	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH		SM2320,2510,4500	1.00				7.84	7.96	8.29	8.27	7.9	7.95	7.93	7.96	8.15
Phenols (mg/L)	mg/L	CONTRACT P-IN	0.00	0.00	ND/0.004	.050/ND	<0.001	<0.001	<0.001	<0.001	0.004	0.004	0.003	0.002	<0.001
Se (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	SM 4110	1.00			429.00	29	47	39	33	48	38	62	54	54
S (COND - CALC) (mg	mg/L	C SM2540	1.00				266	422	467	462	525	495	644	584	512
Toluene (µg/L)		EPA 351.2	0.10	0.80	ND/.002	ND/0.0005		<0.5			<0.5				<0.5
Toluene-d8 (%)		EPA 200.8	0.00					97			101				90
l Kjeldahl Nitrogen (mg/L)		C SM2540	2.00				2.53	3.09	0.72	1.13	1.6	1.57	3	0.784	0.864
otal P - Soluble (mg/L)		EPA 200.8	0.01				0.181	0.0645	0.027	0.028	0.21	0.155	0.729	0.092	0.143
Suspended Solids (mg/L)							139	203	14	37	12	17	27	21	16
Vinyl Chloride				600.00				<0.2			<0.2				<0.2
Zn (mg/L)				0.03	.037/.007	0.033/0.0075	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data															
Temperature							0.2	11.3	6.3	14.9	21.97	18.6	15.6	10.1	1.74
pH							7.94	7.71	8.58	8.22	8.23	8.61	8.1	8.62	8.42
Conductivity							403	641	686	682	763	719	960	863	712
ssolved Oxygen (mg/L)							10.34	11.6	14.93	14.65	6.04	3.66	6.41	7.76	11.2

										SWLTD1 - All Data, Limited Samples					
										March 17, 2020 to December 3, 2021					
32.34															
1533873.00	**1538400.00**	**1543598.00**	**1548372**	**1553600.00**	**1557477.00**	**1565641.00**	**1569101.00**	**1593960.00**	**1599821.00**						
SWLTD-1	**SWLTD-1**	**SWLTD-1**	**SWLTD-1**	**SWLTD-1**	**SWLTD1**	**SWLTD-1**	**SWLTD-1**	**SWLTD1**	**SWLTD-1**						
2020-12-09	**2021-01-14**	**2021-02-25**	**2021-03-30**	**2021-04-23**	**2021-05-14**	**2021-06-28**	**2021-07-15**	**2021-11-04**	**2021-12-03**						
										Mean	Standard Deviation	Positive SD	negative SD	Median	90th %
		125.00			118.00			110.00		109.17	12.25	121.42	96.91	108.50	121.50
		<0.4			<0.4			<0.4		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
		78.00			85.00			77.00		90.33	13.05	103.38	77.28	87.50	106.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
<0.01	<0.01	<0.01	0.03	0.02	0.03	0.02	0.08	<0.01	<0.01	0.07	0.08	0.15	-0.01	0.03	0.15
251	236	235	199	222	238	212	224	239	221	228.21	37.62	265.83	190.59	235.00	262.20
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00
0.03	0.03	0.08	0.04	0.02	0.03	0.04	0.05	0.05	0.04	0.043	0.016	0.059	0.026	0.040	0.062
0.07	0.08	0.07	0.06	0.07	0.08	0.08	0.07	0.09	0.07	0.07	0.01	0.09	0.06	0.07	0.09
		<0.5			<0.5			<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
120	113	116	102	103	121	91	106	128	120	105.42	16.41	121.83	89.02	107.00	120.20
3	2	2	1	<1	<1	1	<1	<1	1	3.13	2.13	5.27	1.00	3.00	6.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
50	61	88	66	72	79	114	73	56	51	69.16	20.87	90.02	48.29	69.00	93.60
0.0003	0.0004	0.0002	0.0007	0.0002	0.0003	<0.0002	<0.0002	0.0006	0.0004	0.00	0.00	0.00	0.00	0.00	0.00
23	5	14	54	17	14	<5	27	25	28	27.61	17.02	44.63	10.59	22.00	50.50
760	753	849	739	765	767	811	820	831	770	768.32	113.74	882.05	654.58	767.00	858.80
<0.001	0.002	<0.001	0.002	<0.001	0.001	<0.001	<0.001	0.002	0.002	0.00	0.00	0.00	0.00	0.00	0.00
0.002	0.002	0.001	0.004	0.002	0.002	0.002	0.004	0.003	0.003	0.0028	0.0012	0.0040	0.0016	0.0020	0.0042
		<4.0			<4.0			<4.0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
7	4.9	4.3	11	6.8	7.8	7.7	9.5	10.5	8.6	9.13	3.29	12.42	5.83	8.60	12.30
0.28	0.5	0.27	0.77	0.24	0.36	0.08	0.2	0.74	0.58	0.485	0.434	0.919	0.050	0.360	0.746
Y	Y	Y	Y	Y	Y	Y	y	y	Y	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
353	336	347	300	307	360	289	314	381	357	313.42	49.76	363.18	263.66	314.00	357.60
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
3	3	3	3	3	3	3	4	4	4	3.63	1.50	5.13	2.13	3.00	4.20
13	13	14	11	12	14	15	12	15	14	12.21	2.49	14.70	9.73	13.00	15.00
0.07	0.06	0.03	0.15	0.06	0.06	0.02	<0.01	0.08	0.06	0.08	0.06	0.14	0.02	0.07	0.14
25	34	49	34	35	49	76	48	31	28	41.42	15.93	57.35	25.49	39.00	66.60
0.076	0.071	0.145	0.204	<0.010	0.074	<0.010	0.022	0.013	0.124	0.131	0.173	0.304	-0.042	0.075	0.233
0.000466903	0.000871765	0.001221866	0.001871757	NC	0.008246702	NC	0.000684127	0.000377826	0.001033326	0.004	0.006	0.010	-0.002	0.001	0.010
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	#DIV/0!	#DIV/0!	#DIV/0!	0.15	0.15
11.5	6.81	5.92	10.1	7.39	4.97	2.8	15.8	13.7	14.1	7.24	4.24	11.47	3.00	7.03	13.78
0.098	0.082	0.072	0.166	0.05	0.1	0.171	0.102	0.214	0.124	0.178	0.165	0.34	0.01	0.12	0.28
<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00
8.21	8.18	8.19	7.74	8.22	8.2	8.33	7.73	7.83	7.92	8.04	0.19	8.24	7.85	7.96	8.27
<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	0.002	0.002	0.001	0.00	0.00	0.00	0.00	0.00	0.00
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
48	44	45	49	42	37	49	43	60	54	46.05	8.67	54.72	37.38	47.00	55.20
494	489	552	480	497	499	527	533	540	500	499.37	74.03	573.40	425.34	499.00	558.40
		<0.5			<0.5			<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
		101			96			89		95.67	5.20	100.87	90.46	96.50	101.00
1.16	0.651	0.807	2.04	1.72	1.36	0.92	1.05	1.5	1.06	1.45	0.74	2.19	0.71	1.16	2.62
0.09	0.031	0.046	0.1	0.013	0.075	0.147	0.105	0.13	0.078	0.13	0.16	0.28	-0.03	0.09	0.19
29	16	13	153	12	21	5	2	24	35	41.89	56.62	98.51	-14.72	21.00	141.80
		<0.2			<0.2			<0.2		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	#DIV/0!	#DIV/0!	#DIV/0!	0.01	0.01
0.3	0.12	0.8	6.9	11.9	22.08	27.8	21.7	6.6	2.6	10.61	8.82	19.43	1.78	10.10	21.99
7.87	NA [7]	7.99	7.81	7.91	8.44	8.28	7.86	8.33	---[2]	8.17	0.30	8.47	7.87	8.22	8.59
704	NA [7]	705	734	725	772	801	819	821	---[2]	735.88	115.91	851.80	619.97	725.00	837.80
13.2	14.71	11.8	10.81	16.03	12.83	4.09	8.3	11.16	12.23	10.62	3.66	14.28	6.96	11.20	14.75

N	N > Objective
6.00	
0.00	
6.00	
0.00	
12.00	
19.00	
1.00	
19.000	0.000
19.00	
0.00	
19.00	
15.00	
0.00	
19.00	0.00
16.00	
18.00	
19.00	
8.00	
19.0000	5.0000
0.00	
19.00	
19.000	7.000
0.00	
19.00	
0.00	
19.00	
19.00	
18.00	
19.00	0.00
16.000	
16.000	1.000
1.00	
19.00	7.00
19.00	10.00
2.00	
19.00	
7.00	
0.00	
19.00	0.00
19.00	
0.00	
6.00	
19.00	
19.00	
19.00	
0.00	
1.00	
19.00	
17.00	
17.00	
19.00	

Surface Water Station	SWMC1	LAB ID:		Reglated				SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Stream flow (L/sec) (Assumed rqual to SW1 w/o effl				Effluent				456.00	244.00	52.00					61.00
		Sample ID:		Parameter	PWQO (APV for Cl and Na)	Water Quality Guideline - Short/Long Term (mg/L)	Surface Water Quality Guideline - Short/Long				0.00				
Stream flow (L/sec)				mg/L											
								1428322.00	1431593.00		B19-26597-1	B19-27095-4	B19-27537-4	B19-27824-4	
								2019-05-23	2019-06-06	2019-8-8	43700.00	43704.00	43707.00	43711.00	2019-9-4
	Sample Date							2019-05-23	2019-06-06	2019-8-8	2019-08-23	2019-08-27	2019-08-30	2019-09-03	2019-9-4
Analyte	PARAMETER	PWQO	MRL												
2-dichloroethane-d4 (%)								102	104						
4-dichlorobenzene (µg/L)					4.00			<0.4	<0.4		< 0.5	< 0.5	< 0.5	< 0.5	
bromofluorobenzene (%)								95	120						
Ag (mg/L)	Silver	0.0001	0.0001					<0.0001	<0.0001						
Al (dissolved) (mg/L)	Al (dissolved)	0.075*	0.01					0.01	<0.01						
kalinity as CaCO3 (mg/	kalinity as CaCO3		5					188	190		192	202	184	170	
As (mg/L)	Arsenic	0.1	0.001					<0.001	<0.001						
B (mg/L)	Boron	0.2*	0.01		0.2*	29/1.5	ND/1.2	0.05	0.05		0.089	0.106	0.079	0.082	
Ba (mg/L)	Barium		0.01					0.05	0.05		0.061	0.072	0.062	0.062	
Benzene (µg/L)					100.00	ND/370	ND/40	<0.5	<0.5		< 0.5	< 0.5	< 0.5	< 0.5	
Ca (mg/L)	Calcium		1					82	74		64.7	71.3	62.4	62.5	
CBOD5 (mg/L)	emical Oxygen Demand		1	10.0				4	3		< 3	< 3	< 3	< 3	
Cd (mg/L)	Cadmium	0.0002	0.0001		0.0002	.001/.00009	calculation	<0.0001	<0.0001		< 0.000070	< 0.000070	< 0.000070	< 0.000070	
Cl (mg/L)	Chloride		1			640/120	600/150	16	20		11.2	13.9	36.5	17.8	
Co (mg/L)	Cobalt	0.0009	0.0002				0.110/0.004	0.0003	0.0003						
COD (mg/L)	ical Oxygen Demand		5					29	35		64	62	63	70	
Conductivity (µmho/cm)	onductivity (µS/cm)		5					445	426		463	465	490	449	
Cr (mg/L)	Chromium (total	0.0089**	0.001		0.0089	ND/.001		0.002	<0.001		0.003	0.004	0.004	0.003	
Cu (mg/L)	Copper	0.005	0.001	0.2		ND/.004	0.029/≤0.002	0.002	0.002		0.0032	0.0036	0.0041	0.0028	
Dichloromethane (µg/L)					100.00	ND/9811		<4.0	<4.0		< 5	< 5	< 5	< 5	
DOC (mg/L)	olved Organic Carbon		0.50					14.5	15.2		18.2	19.8	17.6	16.8	
Fe (mg/L)	Iron	0.3	0.03	1.0	0.300	ND/0.3	0.001/ND	0.43	0.42		1.75	2.37	1.88	1.58	
Filtration								Y	Y						
rdness as CaCO3 (mg	rdness as CaCO3		1					250	230		218	242	213	211	
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001		0.00003	< 0.00002	< 0.00002	< 0.00002	
K (mg/L)	Potassium		1					2	2		3.4	3.9	10.8	3.8	
Mg (mg/L)	Magnesium		1					11	11		13.7	15.4	13.9	13.3	
Mn (mg/L)	Manganese		0.01					0.06	0.08		0.167	0.173	0.124	0.103	
Na (mg/L)	Sodium		2		180.00			12	14		21.3	24.5	21.7	19.1	
N-NH3 (mg/L)	N-NH3 (Ammonia)		0.02	1.0				0.08	0.064		0.14	0.1	0.13	0.09	
(Unionized - calculated	un-ionized Amm	0.02			0.020										
N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10				0.6/0.2	<0.10	<0.10		<0.1	< 0.1	< 0.1	< 0.1	
N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	2.41	1.52		0.2	0.2	0.3	0.3	
P - Total (mg/L)	Total Phosphorus	0.03*	0.01	0.3	0.030			0.03	0.047		0.17	0.22	0.17	0.15	
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001	<0.001		0.0005	0.0007	0.0007	0.0006	
pH	pH (pH units)	6.5-8.5						8.21	8.36						
Phenols (mg/L)	Phenols	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	<0.001	<0.001		<0.002	< 0.002	< 0.002	< 0.002	
Se (mg/L)	Selenium	0.1	0.001					<0.001	<0.001						
SO4 (mg/L)	Sulphate		1				429.00	42	36		20	19	33	30	
S (COND - CALC) (mg	S (COND - CALC)		5					289	277		253	273	292	251	
Toluene (µg/L)					0.80	ND/.002	ND/0.0005	<0.5	<0.5		< 0.5	< 0.5	< 0.5	< 0.5	
Toluene-d8 (%)								95	103						
al Kjeldahl Nitrogen (ma	al Kjeldahl Nitrogen		0.10					1	1.07		1.1	1.1	0.9	1	
Total P - Soluble (mg/L)								0.01	0.0252						
l Suspended Solids (m	tal Suspended Solids		2	10.0				8	58		27	28	32	30	
Vinyl Chloride					600.00			<0.2	<0.2		< 0.2	< 0.2	< 0.2	< 0.2	
Zn (mg/L)	Zinc	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	0.01	<0.01	Field Measuren	0.005	0.014	0.011	0.006	Field Measuren
Field Data	**Field Data:**														
Temperature	Temperature (ºC)									26.1					20
pH	H (field) (pH unit	6.5-8.5						12.3	20	7.98					8.35
Conductivity	uctivity (field) (µS/cm)							7.3	8.32	527					439
Dissolved Oxygen	Dissolved Oxygen			4.00				382.3	503	6.27					5.84

SWMC1	LAB ID:		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
am flow (L/sec) (Assumed rqual to SW1 w/o effl				26.00	26.00	44.97	491.77	100.94	211.35	622.48	287.03	779.00	210.00	44.00	10.00
	Sample ID:					0.00	0.00	0.00	0.00	0.00	0.00				
			B19-28281-4	B19-28725-4	1459464.00	B19-33323-4	B19-33766-4	B19-34301-4	B19-34716-4	B19-35135-4	B19-35418-4	1464898.00	1471799.00	**1475058.00**	**1480014.00**
			2019-9-6	2019-10-10	2019-10-10	43753.00	43756.00	43760.00	43763.00	43767.00	43769.00	2019-11-06	2019-12-11	**SWMC1**	**SWMC1**
Sample Date			2019-9-6	2019-10-10	2019-10-10	2019-10-15	2019-10-18	2019-10-22	2019-10-25	2019-10-29	2019-10-31	2019-11-06	2019-12-11	**2020-01-10**	**2020-02-14**
PARAMETER	PWQO	MRL													
o)					99.2									98	
L)			< 0.5	< 0.5	<0.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5			<0.4	
%)					98									98	
Silver	0.0001	0.0001			<0.0001							<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved)	0.075*	0.01			<0.01							0.04	0.01	<0.01	<0.01
kalinity as CaCO3		5	182	184	203	189	150	187	190	178	196	216	205	240	251
Arsenic	0.1	0.001			<0.001							<0.001	<0.001	<0.001	<0.001
Boron	0.2*	0.01	0.062	0.068	0.07	0.074	0.069	0.064	0.062	0.051	0.067	0.06	0.05	0.05	0.07
Barium		0.01	0.063	0.067	0.06	0.071	0.088	0.067	0.087	0.09	0.081	0.07	0.06	0.07	0.08
			< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5			<0.5	
Calcium		1	66	69.4	78	65.6	102	81.6	111	109	106	109	86	109	109
emical Oxygen Demand		1	< 3	< 3	3	< 3	4	< 3	< 3	< 3	< 3	<1	3	3	4
Cadmium	0.0002	0.0001	< 0.000070	< 0.000070	<0.0001	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	<0.0001	<0.0001	<0.0001	<0.0001
Chloride		1	24.4	22.7	20	19.4	24.2	21.2	21.7	24.6	19.8	21	20	27	35
Cobalt	0.0009	0.0002			0.0015							0.0004	0.0005	0.0003	0.0007
ical Oxygen Demand		5	37	43	33	53	50	31	34	46	39	33	18	31	57
nductivity (µS/cm)		5	492	492	515	513	667	623	671	673	676	683	561	660	688
Chromium (total	0.0089**	0.001	0.004	0.005	0.005	0.005	0.003	0.002	0.002	0.002	0.002	<0.001	0.001	<0.001	0.001
Copper	0.005	0.001	0.0039	0.0042	0.004	0.0029	0.0037	0.0027	0.003	0.0038	0.004	0.002	0.003	0.002	0.003
)			< 5	< 5	<4.0	< 5	< 5	< 5	< 5	< 5	< 5			<4.0	
lved Organic Carbon		0.50	13.5	12.6	13.1	15.9	15.4	13.6	10.3	11.1	14.2	12.3	11	10.7	17.9
Iron	0.3	0.03	1.84	2.19	2.45	2.62	1.35	1.18	1	0.954	0.716	0.36	0.67	0.46	0.84
					Y							Y	Y	Y	Y
rdness as CaCO3		1	220	229	257	226	324	266	350	340	333	338	268	330	334
Mercury	0.0002	0.0001	< 0.00002	< 0.00002	<0.0001	0.00004	0.00009	< 0.00002	< 0.00002	0.00004	< 0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Potassium		1	3.9	7.6	4	4.8	8	4.5	4.6	4.9	4.1	4	3	3	3
Magnesium		1	13.5	13.5	15	15.1	16.7	15.1	17.7	16.5	16.5	16	13	14	15
Manganese		0.01	0.105	0.093	0.17	0.116	0.097	0.055	0.049	0.054	0.037	0.05	0.07	0.06	0.16
Sodium		2	16.8	17.4	20	19.2	14.7	15.8	15	14.5	14.5	14	14	16	26
N-NH3 (Ammonia)		0.02	0.09	0.07	0.119	0.11	0.14	0.18	0.16	0.14	0.17	0.041	<0.010	0.153	0.428
un-ionized Amm	0.02				0.005601224	0.0006	0.0004	0.0013	0.0004	0.0003	0.001	0.000671832	NC	0.00752593	0.006956869
N-NO2 (Nitrite)		0.10	< 0.1	< 0.1	<0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.10	0.8	2.7	1.15	0.4	14.4	5.2	6.2	11.2	6.4	8.89	3.25	3.19	2.35
Total Phosphorus	0.03*	0.01	0.14	0.18	0.141	0.1	0.12	0.08	0.05	0.07	0.07	0.039	0.087	0.044	0.122
Lead	0.025	0.001	0.0007	0.0007	<0.001	0.0008	0.0006	0.0005	0.0004	0.0003	0.0003	<0.001	<0.001	<0.001	<0.001
pH (pH units)	6.5-8.5				8.3							8.28	8.06	8.05	8.25
Phenols	0.001	0.001	< 0.002	< 0.002	<0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.002	<0.001	<0.001	<0.001	<0.001
Selenium	0.1	0.001			<0.001							<0.001	<0.001	<0.001	<0.001
Sulphate		1	38	47	44	38	114	87	100	94	95	87	57	72	68
S (COND - CALC)		5	278	303	335	281	435	361	412	421	404	444	365	429	447
			< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5			<0.5	
					94									107	
al Kjeldahl Nitrogen		0.10	0.9	1	1.19	0.9	1.7	1.1	1.2	1.5	1.3	1.05	1	1.32	2.7
)					0.028							0.018	0.033	0.0202	0.025
al Suspended Solids		2	36	40	94	48	32	23	25	15	16	14	30	6	65
			< 0.2	< 0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2			<0.2	
Zinc	0.03	0.01	0.009	0.01	0.01							<0.01	<0.01	0.01	0.02
Field Data:															
emperature (°C)														0.1	-0.6
H (field) (pH unit	6.5-8.5					8.1	8.8	10	8.2	9.5	11.9	5.9	0.23	8.8	8.33
uctivity (field) (µS/cm)						7.34	7.19	7.56	7.17	6.97	7.35	8.1	8.11	118	118
Dissolved Oxygen												675	92	12.5	6.9

SWMC1	LAB ID:		SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1						
am flow (L/sec) (Assumed rqual to SW1 w/o effl			190.00	1408.00	263.00	190.00	302.00	513.00	118.00	94.00	317.00	480.00	NA [7]	NA	236.00
	Sample ID:														
			1485310.00	1487983.00	1492672.00	1493685.00	1507642.00	1508117.00	1513026.00	1521854.00	1526415.00	1533868.00	1538395.00	1543596.00	1548366.00
			SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1	SWMC1
Sample Date			2020-03-17	2020-04-07	2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09	2021-01-14	2021-02-25	2021-03-30
PARAMETER	PWQO	MRL													
o)				108			107				86			126	
L)				<0.4			<0.4				<0.4			<0.4	
%)				105			90				108			88	
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved)	0.075*	0.01	0.02	0.01	0.02	0.05	0.5	0.26	0.18	0.41	<0.01	0.02	<0.01	<0.01	0.03
kalinity as CaCO3		5	163	167	203	187	128	189	192	239	239	233	206	224	168
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	0.2*	0.01	0.03	0.04	0.05	0.05	0.18	0.21	0.15	0.1	0.08	0.09	0.07	0.07	0.03
Barium		0.01	0.04	0.05	0.05	0.04	0.05	0.06	0.05	0.07	0.06	0.06	0.06	0.07	0.04
				<0.5			<0.5				<0.5			<0.5	
Calcium		1	70	76	79	72	58	88	64	92	106	109	93	105	80
emical Oxygen Demand		1	5	<1	<1	5	7	4	5	7	4	3	3	2	1
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride		1	14	20	17	16	14	13	16	20	24	21	21	37	17
Cobalt	0.0009	0.0002	0.0004	0.0008	0.0003	0.0004	0.001	0.0005	0.0005	0.0005	0.0004	0.0004	0.0005	0.0002	0.0004
ical Oxygen Demand		5	36	49	37	32	89	62	45	27	26	29	31	25	32
nductivity (µS/cm)		5	439	491	490	473	425	586	484	634	689	650	572	683	489
Chromium (total	0.0089**	0.001	0.001	0.002	<0.001	0.001	0.003	0.001	0.002	0.002	0.001	<0.001	0.002	<0.001	<0.001
Copper	0.005	0.001	0.003	0.004	0.002	0.002	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.003
)				<4.0			<4.0				<4.0			<4.0	
lved Organic Carbon		0.50	11.4	12.7	16	17.2	27.5	21.2	16.6	11.1	10.6	11	12.3	10.2	13.4
Iron	0.3	0.03	0.68	1.16	0.48	0.57	1.38	0.6	0.79	0.85	0.47	0.39	0.82	0.37	0.57
			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
rdness as CaCO3		1	208	231	243	221	186	286	209	291	331	334	290	328	241
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium		1	2	3	2	2	4	5	3	4	3	3	3	3	3
Magnesium		1	8	10	11	10	10	16	12	15	16	15	14	16	10
Manganese		0.01	0.07	0.11	0.1	0.13	0.12	0.08	0.08	0.11	0.06	0.09	0.1	0.07	0.06
Sodium		2	14	14	14	13	18	18	24	19	18	14	16	27	10
N-NH3 (Ammonia)		0.02	0.3	0.313	<0.010	0.034	0.153	0.161	0.1	0.024	0.105	0.179	0.239	0.358	0.111
un-ionized Amm	0.02		0.003136407	0.0002	NC	0.000215347	0.001216377	0.026614207	0.001687321	0.002353793	0.000360744	0.023069774	0.003560466	0.001131353	0.000137795
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.10		3.55	1.18	0.67	3.02	3.39	0.18	0.86	5.41	6.63	2.91	3.28	7.16
Total Phosphorus	0.03*	0.01	0.129	0.148	0.042	0.044	0.168	0.114	0.115	0.084	0.037	0.032	0.059	0.046	0.072
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)	6.5-8.5		7.99	7.97	8.13	8.19	7.84	7.95	8.06	8.14	8.19	8.25	8.26	8.24	7.71
Phenols	0.001	0.001	0.002	<0.001	<0.001	<0.001	0.003	0.005	0.004	0.004	<0.001	0.002	<0.001	<0.001	0.003
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate		1	40	44	44	38	58	88	39	70	83	73	58	68	45
S (COND - CALC)		5	285	319	318	307	276	381	315	412	448	422	372	444	318
				<0.5			<0.5				<0.5			<0.5	
				103			101				91			103	
al Kjeldahl Nitrogen		0.10	1.35	2.66	0.995	0.9	2.66	2.04	0.8	0.964	1.04	1.36	1.15	1.35	1.24
)			0.053	0.0122	0.011	0.014	0.04	0.037	0.051	0.085	0.012	0.014	0.018	0.012	0.028
al Suspended Solids		2	20	88	22	30	64	78	39	51	28	34	30	18	59
				<0.2			<0.2				<0.2			<0.2	
Zinc	0.03	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Field Data:															
emperature (ºC)			1.2	4.9	7.1	7.7	21.3	19.5	13.9	9.5	1.3	0	0.26	0.3	2.6
H (field) (pH unit	6.5-8.5		8.07	6.81	8.49	7.62	7.27	8.72	7.84	8.79	7.58	9.25	NA [7]	7.58	7.09
uctivity (field) (µS/cm)			419	485	489	457	412	552	480	623	623	617	NA [7]	584	455
Dissolved Oxygen			11.22	13.27	9.58	11.56	6.5	4.4	6.51	8.05	1095	13.05	14.94	12.39	12.13

SWMC1	LAB ID:									SWMC1 Group B - 2019-05-23 to December 3, 2021					
am flow (L/sec) (Assumed rqual to SW1 w/o efflu			509.00	296.00	195.00	827.00	313.00	1000.00	723.00						
	Sample ID:										2019-5-23 to 2021-12-03				
			1553594.00	**1557480.00**	**1565636.00**	**1569095.00**	**1587662**	**1593966**	1599816.00						
			SWMC1	**SWMC1**	**SWMC1**	**SWMC1**	**SWMC1**	**SWMC1**	SWMC1	BK - CY					
Sample Date			**2021-04-23**	**2021-05-14**	**2021-06-28**	**2021-07-15**	**2021-10-06**	**2021-11-04**	2021-12-03					Group B	Grp B
PARAMETER	PWQO	MRL								Mean	tandard Deviatio	+ve SD	-ve SD	Median	90th %
o)				114				87		103.12	11.91	115.03	91.21	103.00	115.20
L)				<0.4				<0.4		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
%)				80				85		96.70	11.94	108.64	84.76	96.50	109.20
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Al (dissolved)	0.075*	0.01	0.08	0.03	<0.01	0.09	<0.01	<0.01	<0.01	0.11	0.15	0.26	-0.04	0.04	0.34
kalinity as CaCO3		5	169	197	259	223	241	236	234	199.85	29.39	229.23	170.46	192.00	239.20
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00
Boron	0.2*	0.01	0.05	0.05	0.1	0.16	0.11	0.06	0.06	0.08	0.04	0.12	0.04	0.07	0.12
Barium		0.01	0.05	0.05	0.08	0.07	0.09	0.09	0.07	0.06	0.01	0.08	0.05	0.06	0.09
				<0.5				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Calcium		1	70	94	108	96	105	126	118	87.88	18.88	106.76	69.00	86.00	109.00
emical Oxygen Demand		1	<1	<1	4	<1	2	5	1	3.73	1.58	5.31	2.15	4.00	5.00
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Chloride		1	41	18	19	16	27	28	29	21.65	6.85	28.50	14.81	20.00	30.20
Cobalt	0.0009	0.0002	0.0002	0.0003	0.0002	0.0003	0.0003	0.0006	0.0005	0.0005	0.0003	0.0007	0.0002	0.0004	0.0007
ical Oxygen Demand		5	31	37	13	46	18	<5	33	40.16	15.90	56.06	24.26	35.50	62.30
nductivity (µS/cm)		5	604	505	670	637	706	750	730	573.31	100.69	674.00	472.62	572.00	688.20
Chromium (total	0.0089**	0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	0.001	0.0024	0.0013	0.0037	0.0011	0.0020	0.0043
Copper	0.005	0.001	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.0028	0.0008	0.0036	0.0019	0.0029	0.0040
)				<4.0				<4.0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
lved Organic Carbon		0.50	12.6	18	8.6	15.3	12.2	12.2	8.8	14.17	3.75	17.92	10.42	13.40	18.04
Iron	0.3	0.03	0.3	0.42	0.29	0.44	0.39	0.82	0.64	0.96	0.66	1.62	0.30	0.72	1.94
			Y	Y	Y	y	Y	y	Y	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
rdness as CaCO3		1	216	288	360	314	332	393	369	278.21	56.39	334.60	221.81	268.00	342.00
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00	0.00	0.00	0.00	0.00	0.00
Potassium		1	4	3	4	5	5	4	4	3.96	1.71	5.67	2.24	3.90	5.00
Magnesium		1	10	13	22	18	17	19	18	14.25	2.97	17.22	11.28	15.00	17.76
Manganese		0.01	0.05	0.06	0.03	0.08	0.03	0.07	0.06	0.09	0.04	0.12	0.05	0.08	0.14
Sodium		2	29	18	18	17	17	19	19	17.60	4.20	21.80	13.40	17.00	24.10
N-NH3 (Ammonia)		0.02	2.56	0.015	<0.010	0.093	0.114	0.098	0.064	0.21	0.41	0.62	-0.21	0.12	0.31
un-ionized Amm	0.02		0.001299672	0.001339024	NC	0.005481032	0.00028207	0.000158881	0.000585867	0.0035	0.0064	0.0099	-0.0029	0.0012	0.0071
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
N-NO3 (Nitrate)		0.10	2.57	1.75	4.74	8.08	5.32	9.85	9.13	3.97	3.49	7.45	0.48	3.11	8.96
Total Phosphorus	0.03*	0.01	0.04	0.031	0.039	0.067	0.044	0.057	0.039	0.088	0.052	0.140	0.036	0.070	0.168
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00
pH (pH units)	6.5-8.5		8.04	8.19	8.02	7.7	8.18	7.91	7.99	8.09	0.17	8.26	7.92	8.13	8.27
Phenols	0.001	0.001	<0.0010	<0.0010	<0.001	0.003	0.001	<0.001	0.001	0.00	0.00	0.00	0.00	0.003	0.004
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Sulphate		1	65	46	85	77	83	87	82	61.38	24.22	85.61	37.16	58.00	89.20
S (COND - CALC)		5	393	328	436	414	459	488	474	363.05	71.08	434.13	291.97	365.00	447.20
				<0.5				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
				109				83		98.90	8.01	106.91	90.89	102.00	107.20
al Kjeldahl Nitrogen		0.10	3.72	1.02	0.916	1.38	1.12	2	1.08	1.35	0.62	1.98	0.73	1.10	2.16
)			0.017	0.014	0.015	0.033	0.022	0.019	0.011	0.03	0.02	0.04	0.01	0.02	0.04
al Suspended Solids		2	18	28	6	40	10	36	42	35.08	21.34	56.42	13.73	30.00	64.20
				<0.2				<0.2		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
Zinc	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.01	0.01	0.02
Field Data:															
emperature (ºC)			4.6	12.9	23.4	19.5	14.2	5.3	1.8	9.04	8.68	17.71	0.36	6.20	20.91
H (field) (pH unit	6.5-8.5		6.63	8.63	7.77	8.22	6.99	7.11	---[2]	8.40	2.87	11.27	5.53	8.15	9.95
uctivity (field) (µS/cm)			539	500	677	641	702	751	---[2]	352.61	269.73	622.34	82.87	456.00	639.20
Dissolved Oxygen			13.9	13.74	9.15	7.8	11.66	12.02	12.84	106.55	254.37	360.92	-147.82	12.08	418.51

SWMC1	LAB ID:		
am flow (L/sec) (Assumed rqual to SW1 w/o effl			
	Sample ID:		
Sample Date			
PARAMETER	PWQO	MRL	N (above detection limit)
o)			10.00
L)			0.00
%)			10.00
Silver	0.0001	0.0001	0.00
Al (dissolved)	0.075*	0.01	16.00
kalinity as CaCO3		5	39.00
Arsenic	0.1	0.001	3.00
Boron	0.2*	0.01	39.00
Barium		0.01	39.00
			0.00
Calcium		1	39.00
emical Oxygen Demand		1	22.00
Cadmium	0.0002	0.0001	0.00
Chloride		1	39.00
Cobalt	0.0009	0.0002	27.0000
nical Oxygen Demand		5	38.00
nductivity (µS/cm)		5	39.00
Chromium (total	0.0089**	0.001	28.0000
Copper	0.005	0.001	39.0000
)			0.00
lved Organic Carbon		0.50	39.00
Iron	0.3	0.03	39.00
			0.00
rdness as CaCO3		1	39.00
Mercury	0.0002	0.0001	4.00
Potassium		1	39.00
Magnesium		1	39.00
Manganese		0.01	39.00
Sodium		2	39.00
N-NH3 (Ammonia)		0.02	36.00
un-ionized Amm	0.02		28.0000
N-NO2 (Nitrite)		0.10	0.00
N-NO3 (Nitrate)		0.10	38.00
Total Phosphorus	0.03*	0.01	39.000
Lead	0.025	0.001	12.00
pH (pH units)	6.5-8.5		27.00
Phenols	0.001	0.001	10.00
Selenium	0.1	0.001	0.00
Sulphate		1	39.00
S (COND - CALC)		5	39.00
			0.00
			10.00
al Kjeldahl Nitrogen		0.10	39.00
)			27.00
al Suspended Solids		2	39.00
			0.00
Zinc	0.03	0.01	12.00
Field Data:			
emperature (ºC)			24.00
H (field) (pH unit	6.5-8.5		32.00
uctivity (field) (µS/cm)			32.00
Dissolved Oxygen			28.00

Surface Water Station SWMC2															
							1147927	1173931	1198012	1214686	1226558	1239652	1256601	**1459463.00**	**1460893.00**
		LAB ID:					**SWMC2**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**		**SWMC2A**	**SWMC2A**	**SWMC2A**
	Date Sampled:			PWQO (APV for Cl and Na)	CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long	**2019-05-23**	**2019-06-06**	**2019-06-19**	**2019-07-12**	**2019-08-08**	**2019-9-4**	**2019-09-23**	**2019-10-10**	**2019-10-18**
	SWMC3 Measured Flow						253.00	125.00	141.00	731.00	10.00	27.00	14.00	21.00	184.00
	SWAF Measured Flow						71.00	21.00	32.00	3.90	4.30	3.70	14.00	3.10	5.10
	SWMC2 Estimated Flow						324.00	146.00	173.00	734.90	14.30	30.70	28.00	24.10	189.10
Analyte	PARAMETER	PWQO	MRL												
,2-dichloroethane-d4 (%)							90	110						98.4	
4-dichlorobenzene (µg/L)				4.00			<0.4	<0.4						<0.4	
bromofluorobenzene (%)							114	127						97	
Ag (mg/L)	Silver	0.0001	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	Al (dissolved)	0.075*	0.01				0.01	<0.01	<0.01	0.01	<0.01		<0.01	<0.01	0.04
kalinity as CaCO3 (mg/	kalinity as CaCO3		5				176	183	196	144	223		179	200	166
As (mg/L)	Arsenic	0.1	0.001				<0.001	<0.001	0.001	<0.001	0.001		0.001	<0.001	<0.001
B (mg/L)	Boron	0.2*	0.01	0.2*	29/1.5	ND/1.2	0.03	0.04	0.04	0.04	0.09		0.11	0.07	0.05
Ba (mg/L)	Barium		0.01				0.05	0.05	0.08	0.08	0.06		0.06	0.05	0.08
Benzene (µg/L)				100.00	ND/370	ND/40	<0.5	<0.5		67				<0.5	
Ca (mg/L)	Calcium		1				79	73	89		65		62	76	102
CBOD5 (mg/L)	mical Oxygen Demand		1				2	1	11	<1	5		1	3	9
Cd (mg/L)	Cadmium	0.0002	0.0001	0.0002	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Cl (mg/L)	Chloride		1		640/120	600/150	16	20	20	17	14		14	19	19
Co (mg/L)	Cobalt	0.0009	0.0002			0.110/0.004	0.0003	0.0002	0.0015	0.0005	0.0004		0.0005	0.0004	0.0005
COD (mg/L)	hical Oxygen Demand		5				35	34	31	22	42		48	29	36
Conductivity (µmho/cm)	nductivity (µS/cm)		5				426	405	520	442	472		428	505	679
Cr (mg/L)	Chromium (total	0.0089**	0.001	0.0089	ND/.001		0.002	<0.001	0.004	0.001	0.003		0.002	0.002	0.001
Cu (mg/L)	Copper	0.005	0.001		ND/.004	0.029/≤0.002	0.002	0.002	0.007	0.003	0.003		0.002	0.002	0.003
Dichloromethane (µg/L)				100.00	ND/9811		<4.0	<4.0						<4.0	
DOC (mg/L)	olved Organic Carbon		0.50				14.7	15.7	14.4	12.4	18.9		18.6	13.6	12.9
Fe (mg/L)	Iron	0.3	0.03	0.300	ND/0.3	0.001/ND	0.45	0.38	2.58	0.69	0.72		0.71	0.74	0.6
Filtration							Y	Y	Y	Y	Y		Y	Y	Y
ardness as CaCO3 (mg	ardness as CaCO3		1				238	223	272	200	216		208	247	321
Hg (mg/L)	Mercury	0.0002	0.0001	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
K (mg/L)	Potassium		1				2	2	3	4	3		4	4	5
Mg (mg/L)	Magnesium		1				10	10	12	8	13		13	14	16
Mn (mg/L)	Manganese		0.01				0.06	0.08	0.13	0.09	0.12		0.1	0.04	0.07
Na (mg/L)	Sodium		2	180.00			11	13	13	9	19		16	18	13
N-NH3 (mg/L)	-NH3 (Ammonia)		0.02				0.05	0.072	0.17	0.12	0.114		0.19	0.129	0.12
(Unionized - calculated	un-ionized Amm	0.02		0.020							0.004559942		0.008287566	0.006402535	0.002397016
N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10			0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10		124/3.0	32.8/3.0	2.39	1.53	2.64	8.31	0.27		0.23	1.08	11.8
P - Total (mg/L)	otal Phosphoru	0.03*	0.01	0.030			0.033	0.046	0.2	0.123	0.111		0.086	0.051	0.064
Pb (mg/L)	Lead	0.025	0.001	0.025	ND/.007	0.003/ND	<0.001	<0.001	0.002	<0.001	<0.001		<0.001	<0.001	<0.001
pH	pH (pH units)	6.5-8.5					8.25	8.38	8.11	8.09	8.49		8.06	8.55	7.9
Phenols (mg/L)	Phenols	0.001	0.001	0.0010	ND/0.004	.050/ND	<0.001	<0.001	<0.001	<0.001	<0.001		0.005	<0.001	<0.001
Se (mg/L)	Selenium	0.1	0.001				<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
SO4 (mg/L)	Sulphate		1			429.00	39	35	38	32	23		29	43	111
S (COND - CALC) (mg	S (COND - CALC)		5				277	263	338	287	307		278	328	441
Toluene (µg/L)				0.80	ND/.002	ND/0.0005	<0.5	<0.5						<0.5	
Toluene-d8 (%)							98	103						93	
al Kjeldahl Nitrogen (mg	al Kjeldahl Nitrogen		0.10				1.2	1.12	1.09	1.64	1.21		1.3	1.01	1.36
Total P - Soluble (mg/L)							0.009	0.0252	0.032	0.061	0.067		0.038	0.022	0.017
al Suspended Solids (mg	al Suspended Solids		2				12	15	204	57	21		25	12	31
Vinyl Chloride				600.00											
Zn (mg/L)	Zinc	0.03	0.01	0.03	.037/.007	0.033/0.0075	<0.01	<0.01	<0.01	<0.01	<0.01		0.01	<0.01	<0.01
Field Data	**Field Data:**														
Temperature							14.7	21	19.1	19.2	24.7	19.7	20.2		9
pH		6.5-8.5					8.41	8.29	7.67	7.91	7.88	8.19			8.08
Conductivity							383.4	439	546	241	538	422	instrument failure		661
Dissolved Oxygen (mg/L)							13.16	20.12	9.54	8.59	7.41	7.42	6.08		12.01

SWMC2														
			1464897.00	**1471803.00**	**1475061.00**	**1485312.00**	**1487986.00**	**1492674.00**	**1493687.00**	**1507644.00**	**1508119.00**	**1513028.00**	**1521856.00**	**1526417.00**	**1533869.00**
	LAB ID:		**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**	**SWMC2A**
Date Sampled:			**2019-11-06**	**2019-12-11**	**2020-01-10**	**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**
SWMC3 Measured Flow			513.00	373.00	104.10	1211.73	630.33	70.17	49.09	33.50	99.21	9.89	46.00	134.88	185.29
SWAF Measured Flow			18.00	44.00	17.00	99.41	63.39	11.48	10.84	2.67	8.30	13.64	14.46	17.91	10.83
SWMC2 Estimated Flow			531.00	417.00	121.10	1311.14	693.72	81.65	59.93	36.17	107.51	23.53	60.46	152.79	196.12
PARAMETER	PWQO	MRL													
)					97		103			109				87	
L)					<0.4		<0.4			<0.4				<0.4	
%)					101		111			90				111	
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved)	0.075*	0.01	0.04	0.02	0.01	0.02	0.01	0.02	0.03	0.61	0.26	0.13	0.25	<0.01	0.02
kalinity as CaCO3		5	202	198	231	156	174	190	185	120	174	185	223	234	230
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.001	<0.001	<0.001	<0.001
Boron	0.2*	0.01	0.06	0.04	0.05	0.02	0.04	0.05	0.05	0.2	0.21	0.14	0.1	0.09	0.06
Barium		0.01	0.07	0.06	0.06	0.04	0.05	0.05	0.04	0.06	0.06	0.05	0.07	0.06	0.06
					<0.5		<0.5			<0.5				<0.5	
Calcium		1	109	87	104	70	76	79	72	55	85	64	87	103	108
mical Oxygen Demand		1	2	4	3	5	3	<1	<1	5	3	4	5	4	2
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride		1	21	21	26	14	20	16	16	11	13	17	19	25	22
Cobalt	0.0009	0.0002	0.0004	0.0003	0.0003	0.0004	0.0004	0.0002	0.0003	0.0015	0.0005	0.0003	0.0004	0.0002	0.0004
ical Oxygen Demand		5	26	18	29	39	30	39	38	85	55	40	31	24	31
nductivity (µS/cm)		5	676	551	634	423	493	484	466	376	550	476	595	687	634
Chromium (total	0.0089**	0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	0.001	0.005	0.002	0.001	0.002	<0.001	<0.001
Copper	0.005	0.001	0.002	0.002	0.002	0.003	0.002	0.001	0.002	0.006	0.003	0.002	0.002	0.002	0.002
					<4.0		<4.0			<4.0				<4.0	
lved Organic Carbon		0.50	12.2	11.9	10.6	11.7	12.7	15.6	16.3	27	22.1	15.9	12.3	10	10.6
Iron	0.3	0.03	0.26	0.44	0.49	0.6	0.51	0.44	0.49	2.08	0.67	0.57	0.78	0.34	0.35
			Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
rdness as CaCO3		1	334	267	313	204	227	243	217	174	270	209	275	319	327
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium		1	3	3	3	2	3	2	2	5	4	3	5	3	2
Magnesium		1	15	12	13	7	9	11	9	9	14	12	14	15	14
Manganese		0.01	0.05	0.07	0.07	0.07	0.08	0.12	0.12	0.13	0.09	0.06	0.07	0.04	0.08
Sodium		2	13	12	14	12	14	12	12	16	12	22	16	16	13
-NH3 (Ammonia)		0.02	<0.010	0.241	0.111	0.163	0.561	0.032	0.05	0.18	0.202	0.09	<0.010	0.11	0.173
un-ionized Amm	0.02		NA	0.005383951	0.002660121	0.001783548	0.0022	0.002748191	0.002510357	0.000917674	0.04390282	0.003773821	N/A	0.00231292	0.000655406
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.10	9.24	3.71	2.79	3.33	3.52	1.27	0.55	2.35	3.49	0.2	0.8	5.8	6.36
otal Phosphoru	0.03*	0.01	0.034	0.056	0.046	0.077	0.051	0.036	0.037	0.228	0.1	0.084	0.075	0.021	0.025
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)	6.5-8.5		8.34	8.03	7.96	7.99	7.9	8.17	8.22	7.85	8.02	8.07	8.13	8.24	8.29
Phenols	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	0.005	0.005	0.004	<0.001	<0.001
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate		1	83	58	64	35	43	41	38	50	80	40	62	83	71
S (COND - CALC)		5	439	358	412	275	320	315	303	244	358	309	387	447	412
					<0.5		<0.5			<0.5				<0.5	
					110		106			102				90	
al Kjeldahl Nitrogen		0.10	1.29	0.9	1.53	1.49	2.49	1.05	1.22	3.06	1.91	0.9	0.932	1	1.29
			0.019	0.03	0.019	0.013	0.0105	0.009	0.013	0.04	0.037	0.039	0.07	0.012	0.009
al Suspended Solids		2	13	13	8	28	18	13	15	510	46	17	27	8	16
Zinc	0.03	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
Field Data:															
			6.7	0.24	-0.1	1.2	5.1	4.8	6.8	22.44	19.4	14.4	9.7	1.7	0
	6.5-8.5		8.06	8.44	8.48	8.09	7.51	8.89	8.57	7.04	8.87	8.23	8.87	8.36	7.67
			666	538	618	414	470	490	497	387	526	474	570	622	588
.)			11.63	meter frozen	10.58	11.65	13.84	12.06	15.85	5.74	5.28	7.92	8.23	12.11	13.39

SWMC2													SWMC2 - Backgroun		
			1538397.00	**1548368.00**	**1553596.00**	1557479.00	1565638.00	1569097.00	**1587664**	**1593962**	1599818				
	LAB ID:		**SWMC2A**	**SWMC2A**	**SWMC2A**	SWMC2A	SWMC2A	SWMC2A	**SWMC2A**	**SWMC2A**	SWMC2A				
	Date Sampled:		**2021-01-14**	**2021-03-30**	**2021-04-23**	**2021-05-14**	**2021-06-28**	**2021-07-15**	**2021-10-05**	**2021-11-04**	2021-12-03		BI - CM		
	SWMC3 Measured Flow		**78.00**	**909.00**	262.00	99.00	62.00	NA	179.00	278.00	381.00				
	SWAF Measured Flow		**12.00**	**94.00**	30.00	12.00	6.00	94.00	NA	NA	NA				
	SWMC2 Estimated Flow		**90.00**	**1003.00**	292.00	111.00	68.00	94.00	179.00	278.00	381.00				
PARAMETER	PWQO	MRL				**2021-05-14**	**2021-06-28**	**2021-07-15**	**2021-10-05**	**2021-11-04**	2021-12-03		Mean	Standard Deviation	Positive SD
)						122				116			103.60	11.69	115.29
L)						<0.4				<0.4			#DIV/0!	#DIV/0!	#DIV/0!
%)						81				73			100.56	17.19	117.75
Silver	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!
Al (dissolved)	0.075*	0.01	<0.01	0.03	0.07	0.03	0.03	0.15	<0.01	<0.01	<0.01		0.09	0.14	0.23
kalinity as CaCO3		5	200	161	165	193	231	190	233	230	222		193.13	29.27	222.41
Arsenic	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.00	0.00	0.00
Boron	0.2*	0.01	0.09	0.04	0.05	0.04	0.05	0.15	0.09	0.06	0.04		0.073	0.048	0.121
Barium		0.01	0.06	0.04	0.05	0.05	0.09	0.06	0.09	0.08	0.07		0.06	0.01	0.07
						<0.5				<0.5			67.00	#DIV/0!	#DIV/0!
Calcium		1	93	79	70	95	108	94	106	123	117		87.24	17.87	105.11
mical Oxygen Demand		1	3	2	2	3	2	<1	3	<1	<1		3.63	2.32	5.94
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!
Chloride		1	21	17	43	18	22	17	27	28	29		20.07	6.23	26.29
Cobalt	0.0009	0.0002	0.0004	0.0004	<0.0002	0.0002	0.0002	0.0003	0.0003	0.0002	0.0004		0.0004	0.0003	0.0007
ical Oxygen Demand		5	26	32	32	38	21	58	26	<5	36		35.55	13.22	48.78
nductivity (µS/cm)		5	566	479	601	496	633	589	705	736	707		547.80	103.10	650.90
Chromium (total	0.0089**	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	0.001		0.0018	0.0012	0.0029
Copper	0.005	0.001	0.002	0.003	0.002	0.002	0.002	0.003	0.002	0.002	0.002		0.0025	0.0012	0.0037
						<4.0				<4.0			#DIV/0!	#DIV/0!	#DIV/0!
lved Organic Carbon		0.50	12.8	14.1	12.6	18.2	9.9	18	12	12.5	9.1		14.31	3.88	18.19
Iron	0.3	0.03	0.69	0.47	0.25	0.4	0.23	0.44	0.41	0.3	0.46		0.618	0.494	1.112
			Y	Y	Y	Y	Y	y	Y	y	Y		#DIV/0!	#DIV/0!	#DIV/0!
rdness as CaCO3		1	286	234	216	287	344	292	331	377	358		267.63	54.39	322.03
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!
Potassium		1	2	2	4	2	3	4	5	3	3		3.17	1.02	4.19
Magnesium		1	13	9	10	12	18	14	16	17	16		12.50	2.84	15.34
Manganese		0.01	0.1	0.05	0.05	0.08	0.02	0.09	0.03	0.04	0.06		0.08	0.03	0.11
Sodium		2	15	9	29	16	14	13	17	17	16		14.73	3.90	18.64
-NH3 (Ammonia)		0.02	0.239	0.141	2.52	0.032	<0.010	0.116	0.048	0.105	0.059		0.227	0.470	0.697
un-ionized Amm	0.02		0.003118216	0.000823155	0.00522508	0.004024843	NC	0.009569904	0.001230897	0.001975178	0.000572466		0.005	0.009	0.014
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		#DIV/0!	#DIV/0!	#DIV/0!
N-NO3 (Nitrate)		0.10	3.01	7.28	2.51	1.76	4.94	8.33	6.2	8.82	9.94		4.148	3.288	7.436
otal Phosphoru	0.03*	0.01	0.048	0.055	0.042	0.033	0.037	0.058	0.044	0.027	0.03	28.000	0.065	0.048	0.113
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.00	0.00	0.00
pH (pH units)	6.5-8.5		8.21	7.72		8.19	8.1	7.68	8.16	7.96	8.03		8.11	0.20	8.31
Phenols	0.001	0.001	<0.001	0.002	<0.0010	<0.0010	<0.001	0.002	<0.004	<0.001	<0.001		0.0039	0.0013	0.0052
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!
Sulphate		1	59	43	65	45	84	74	78	86	76		56.93	21.74	78.67
S (COND - CALC)		5		311	391	322	411	383	458	478	460		355.59	68.20	423.79
						<0.5				<0.5			#DIV/0!	#DIV/0!	#DIV/0!
			368			108				101			127.90	84.60	212.50
al Kjeldahl Nitrogen		0.10	0.959	1.12	4.08	1.14	1.03	1.64	1.24	1.43	1.25		1.43	0.68	2.11
			0.018	0.028	0.016	0.014	0.016	0.034	0.026	0.028	0.01		0.03	0.02	0.04
l Suspended Solids		2	12	47	15	17	9		13	6	22		43.10	96.85	139.95
						<0.2				<0.2			#DIV/0!	#DIV/0!	#DIV/0!
Zinc	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Field Data:															
			0.03	3	5.5	13.4	24.6	21.3	16.2	6.5	1.4		11.06	8.54	19.61
	6.5-8.5		NA [7]	7.75	7.21	8.78	8.45	8.32	7.95	8.14	---[2]		8.15	0.48	8.63
			NA [7]	431	538	489	641	568	689	730	---[2]		525.05	110.15	635.20
.)			14.79	12.14	14.05	11.95	8.39	9.2	10.46	12.4	11.18		10.94	3.29	14.23

SWMC2			d Group B - 2019-5-23 to 2021-12-3					
	LAB ID:							
Date Sampled:								
SWMC3 Measured Flow								Water Quality Objective / Guideline
SWAF Measured Flow								
SWMC2 Estimated Flow								
PARAMETER	PWQO	MRL	negative SD	SWMC2 Grp B Median	SWMC2 Grp A 90th %	N	Count > Obj	
)			91.91	103.00	117.20	9.00		
L)			#DIV/0!	#NUM!	#NUM!	0.00		
%)			83.36	101.00	116.60	9.00		
Silver	0.0001	0.0001	#DIV/0!	#NUM!	#NUM!	0.00		
Al (dissolved)	0.075*	0.01	-0.05	0.03	0.25	20.00		
kalinity as CaCO3		5	163.86	191.50	231.00	30.00		
Arsenic	0.1	0.001	0.00	0.00	0.00	6.00		
Boron	0.2*	0.01	0.025	0.050	0.141	30.000	0.000	1.20
Barium		0.01	0.05	0.06	0.08	30.00		
			#DIV/0!	67.00	67.00	1.00		
Calcium		1	69.37	87.00	108.20	29.00		
mical Oxygen Demand		1	1.31	3.00	5.00	24.00		
Cadmium	0.0002	0.0001	#DIV/0!	#NUM!	#NUM!	0.00		
Chloride		1	13.84	19.00	27.10	30.00	0.00	120.00
Cobalt	0.0009	0.0002	0.0001	0.0004	0.0005	29.0000		
ical Oxygen Demand		5	22.33	32.00	49.40	29.00		
nductivity (µS/cm)		5	444.70	535.00	688.80	30.00		
Chromium (total	0.0089**	0.001	0.0006	0.0010	0.0033	18.0000		
Copper	0.005	0.001	0.0013	0.0020	0.0030	30.0000	7.0000	0.002
			#DIV/0!	#NUM!	#NUM!	0.00		
lved Organic Carbon		0.50	10.43	12.85	18.63	30.00		
Iron	0.3	0.03	0.124	0.480	0.744	30.000	20.000	0.300
			#DIV/0!	#NUM!	#NUM!	0.00		
rdness as CaCO3		1	213.24	268.50	335.00	30.00		
Mercury	0.0002	0.0001	#DIV/0!	#NUM!	#NUM!	0.00		
Potassium		1	2.15	3.00	5.00	30.00		
Magnesium		1	9.66	13.00	16.00	30.00		
Manganese		0.01	0.05	0.07	0.12	30.00		
Sodium		2	10.83	14.00	18.10	30.00	0.00	180.00
-NH3 (Ammonia)		0.02	-0.242	0.120	0.240	27.000		NA
un-ionized Amm	0.02		-0.004	0.003	0.008	23.000	12.000	0.020
N-NO2 (Nitrite)		0.10	#DIV/0!	#NUM!	#NUM!	0.00		
N-NO3 (Nitrate)		0.10	0.861	3.170	8.862	30.000	9.000	3.000
otal Phosphoru	0.03*	0.01	0.017	0.050	0.112	30.000	19.000	0.03
Lead	0.025	0.001	0.00	0.00	0.00	2.00		
pH (pH units)	6.5-8.5		7.90	8.10	8.35	29.00		
Phenols	0.001	0.001	0.0025	0.0040	0.0050	7.0000		
Selenium	0.1	0.001	#DIV/0!	#NUM!	#NUM!	0.00		
Sulphate		1	35.20	54.00	83.10	30.00	0.00	429.00
S (COND - CALC)		5	287.39	338.00	449.20	29.00		
			#DIV/0!	#NUM!	#NUM!	0.00		
			43.30	102.50	135.80	10.00		
al Kjeldahl Nitrogen		0.10	0.75	1.23	1.97	30.00		
			0.01	0.02	0.04	30.00		
al Suspended Solids		2	-53.74	16.00	49.00	29.00		
			#DIV/0!	#NUM!	#NUM!	0.00		
Zinc	0.03	0.01						
Field Data:								
			2.52	9.35	21.41	30.00		
	6.5-8.5		7.67	8.19	8.82	27.00		
			414.90	538.00	663.00	27.00		
)			7.65	11.63	14.20	29.00		

Surface Water Station SWMC3															
SWMC3 Stream Flow (L/sec)							253.00	125.00	141.00	731.00	10.00	27.00	14.00	21.00	184.00
Effluent Discharge (L/sec)							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							1428331.00	1431583.00	1434214.00	1440940.00	1446255.00		1455462.00	1459457.00	1460888.00
							SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3
				PWQO (APV	CCME Surface Water Quality Guideline - Short/Long	Environment BC Surface Water Quality Guideline - Short/Long	2019-05-23	2019-06-06	2019-06-19	2019-07-12	2019-08-08	2019-9-4	2019-09-23	2019-10-10	2019-10-18
Analyte	Units	nalytical Metho	MRL	for Cl and Na)	Term (mg/L)	Term (mg/L)									
2-dichloroethane-d4 (	%	EPA 8260	0.00				100	102						95.3	
-dichlorobenzene (µg	ug/L	EPA 8260	0.40	4.00			<0.4	<0.4						<0.4	
romofluorobenzene (	%	EPA 8260	0.00				93	117						98	
Ag (mg/L)	mg/L	EPA 200.8	0.00				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	EPA 200.8	0.01				0.02	<0.01	<0.01	0.02	<0.01		<0.01	<0.01	0.09
alinity as CaCO3 (mg	mg/L	2320,2510,4500	5.00				210	219	228	147	195		186	207	172
As (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
B (mg/L)	mg/L	EPA 200.8	0.01	0.2*	29/1.5	ND/1.2	0.02	0.01	0.02	0.03	0.04		0.04	0.03	0.03
Ba (mg/L)	mg/L	EPA 200.8	0.01				0.06	0.07	0.08	0.09	0.08		0.08	0.07	0.05
Benzene (µg/L)	ug/L	EPA 8260	0.50	100.00	ND/370	ND/40	<0.5	<0.5						<0.5	
Ca (mg/L)	mg/L	SM3120B-3500	1.00				98	93	107	71	81		82	101	117
CBOD5 (mg/L)	mg/L	SM 5210B	1.00				2	5	3	<1	2		<1	5	3
Cd (mg/L)	mg/L	EPA 200.8	0.00	0.00	.001/.00009	calculation	<0.0001	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	SM 4110	1.00		640/120	600/150	24	29	28	19	35		34	35	23
Co (mg/L)	mg/L	EPA 200.8	0.00			0.110/0.004	0.0003	<0.0002	<0.0002	0.0004	<0.0002		0.0004	<0.0002	0.0006
COD (mg/L)	mg/L	C SM5220D	5.00				15	14	7	36	8		21	11	35
Conductivity (µmho/cm	uS/cm	C SM2510B	5.00				500	520	629	473	578		564	621	728
Cr (mg/L)	mg/L	EPA 200.8	0.00	0.01	ND/.001		0.001	<0.001	<0.001	<0.001	0.001		<0.001	<0.001	<0.001
Cu (mg/L)	mg/L	EPA 200.8	0.00		ND/.004	0.029/≤0.002	0.002	0.001	0.001	0.003	0.002		0.002	0.001	0.003
ichloromethane (µg/L	ug/L	EPA 8260	4.00	100.00	ND/9811		<4.0	<4.0						<4.0	
DOC (mg/L)	mg/L	ONTRACT-E-IN	0.50				8.1	7.9	7.6	11.5	6.5		6.8	5.8	10.6
Fe (mg/L)	mg/L	EPA 200.8	0.03	0.30	ND/0.3	0.001/ND	0.32	0.25	0.18	0.52	0.15		0.46	0.11	0.22
Filtration		EPA 200.8					Y	Y	Y	Y	Y		Y	Y	Y
dness as CaCO3 (mg	mg/L	C SM2340B	1.00				290	278	317	210	252		258	314	358
Hg (mg/L)	mg/L	EPA 200.8	0.00	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	SM3120B-3500	1.00				2	2	2	4	3		4	4	5
Mg (mg/L)	mg/L	SM3120B-3500	1.00				11	11	12	8	12		13	15	16
Mn (mg/L)	mg/L	EPA 200.8	0.01				0.04	0.04	0.02	0.07	0.03		0.11	0.01	0.04
Na (mg/L)	mg/L	SM3120B-3500	2.00	180.00			12	14	12	9	21		17	18	9
N-NH3 (mg/L)	mg/L	UBCONTRACT-	0.01				0.01	0.033	0.06	0.09	0.038		0.08	0.02	0.04
Unionized - calculated) (mg/L)				0.02							0.001188571		0.004723209	0.001068785	0.000266406
N-NO2 (mg/L)	mg/L	SM 4110	0.10			0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (mg/L)	mg/L	SM 4110	0.10		124/3.0	32.8/3.0	2.74	2.03	3.8	9.24	1.48		0.12	1.27	12.4
P - Total (mg/L)	mg/L	EPA 200.8	0.00	0.03			0.016	0.019	0.024	0.124	0.043		0.078	0.016	0.042
Pb (mg/L)	mg/L	EPA 200.8	0.00	0.03	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
pH		SM2320,2510,4500	1.00				8.32	8.27	8.17	8.2	8.49		8.24	8.41	7.88
Phenols (mg/L)	mg/L	UBCONTRACT-	0.00	0.00	ND/0.004	.050/ND	<0.001	<0.001	<0.001	<0.001	<0.001		0.006	<0.001	<0.001
Se (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	SM 4110	1.00			429.00	46	42	48	34	55		56	70	123
S (COND - CALC) (mg	mg/L	C SM2540	1.00				325	338	409	307	376		367	404	473
Toluene (µg/L)	ug/L	EPA 8260	0.50	0.80	ND/.002	ND/0.0005	<0.5	<0.5						<0.5	
Toluene-d8 (%)	%	EPA 8260	0.00				97	102						94	
l Kjeldahl Nitrogen (m	mg/L	UBCONTRACT-	0.15				0.7	0.84	0.91	1.48	0.93		0.7	0.52	1.19
otal P - Soluble (mg/L	mg/L	EPA 200.8	0.00				0.007	0.0097	0.013	0.066	0.036		0.021	0.009	0.018
Suspended Solids (n	mg/L	C SM2540	2.00				3	3	18	20	6		14	3	10
Vinyl Chloride	ug/L	EPA 8260	0.20	600.00			<0.2	<0.2						<0.2	
Zn (mg/L)	mg/L	EPA 200.8	0.01	0.03	.037/.007	0.033/0.0075	<0.01	0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01
												Field Measurements and Flow only			
Field Data															
Temperature							13.5	12.8	17.3	18.3		17.95	18.9		9.5
pH							8.44	7.16	7.11	7.92		7.61	meter failure		7.58
Conductivity							442.1	596	639	496		499	meter failure		716
ssolved Oxygen (mg/L)							13.25	12.06	6.51	7.07		7.92	6.6		10.15

513.00	**373.00**	**104.10**	**0.00**	**1211.73**	**630.33**	**70.17**	**49.09**	**33.50**	**99.21**	**9.89**	**46.00**	**134.88**	**185.29**	**78.00**	**101.00**	**909.00**
0.00	0.00															
1464888.00	**1471806.00**	**1475064.00**	**1480018.00**	**1485320.00**	**1487993.00**	**1492680.00**	**1493692.00**	**1507651.00**	**1508126.00**	**1513034.00**	**1521862.00**	**1526423.00**	**1533877.00**	**1538404.00**	**1543602.00**	**1548376.00**
SWMC3	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**
2019-11-06	**2019-12-11**	**2020-01-10**	**2020-02-14**	**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**	**2021-01-14**	**2021-02-25**	**2021-03-30**
		83			106			108				89			123	
		<0.4			<0.4			<0.4				<0.4			<0.4	
		102			103			90				106			73	
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
0.05	0.05	0.77	0.01	0.03	0.02	0.02	0.01	<0.01	0.02	<0.01	0.01	0.02	0.03	0.01	<0.01	0.04
206	222	243	241	175	185	221	227	170	210	229	255	255	238	223	220	185
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
0.03	0.04	0.02	0.02	0.01	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02
0.08	0.07	0.07	0.08	0.04	0.05	0.06	0.06	0.06	0.08	0.07	0.08	0.07	0.07	0.07	0.07	0.05
		<0.5			<0.5			<0.5				<0.5			<0.5	
122	102	117	110	73	86	96	89	74	119	92	112	121	116	110	110	87
1	4	3	6	7	2	2	3	7	3	3	6	3	4	2	2	1
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
25	26	32	32	18	27	27	28	31	28	31	33	32	26	28	32	21
0.0005	0.0004	0.0003	0.0005	0.0003	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0004	0.0002	<0.0002	0.0002
25	13	15	15	17	15	20	16	18	31	18	10	12	18	10	14	22
705	631	692	657	447	555	570	570	513	725	631	715	756	679	645	657	523
<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	<0.001	0.002	<0.001	0.001	0.002	0.001	0.001	<0.001	0.002
		<4.0			<4.0			<4.0				<4.0			<4.0	
9.8	8	6.8	7.7	8.2	7.2	7.6	7.1	8.7	10	6.8	6.5	6.7	6.6	6.7	5.2	8.4
0.2	0.22	0.22	0.56	0.32	0.23	0.37	0.32	0.18	0.13	0.1	0.06	0.19	0.22	0.21	0.2	0.22
Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
366	308	346	328	211	252	289	263	226	363	287	337	368	347	332	332	258
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
3	3	2	2	2	3	2	2	2	4	3	4	3	2	2	2	2
15	13	13	13	7	9	12	10	10	16	14	14	16	14	14	14	10
0.04	0.04	0.04	0.07	0.04	0.04	0.05	0.05	0.05	0.03	0.04	0.01	0.01	0.04	0.05	0.04	0.03
12	12	15	17	14	16	16	15	19	17	22	17	16	13	16	18	9
0.036	0.015	0.049	0.118	0.071	0.569	<0.010	<0.010	<0.010	0.035	0.06	<0.010	<0.010	<0.010	0.023	0.05	<0.010
1.6817E-05	0.000152953	0.000474334	0.000233062	0.000492167	0.0037	NC	NC	NC	0.003938733	0.00380613	N/A	N/A	N/A	0.000359228	0.000954832	NC
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
9.69	4.75	3.41	1.93	2.89	3.52	1.45	1.03	0.23	4.04	0.47	1.49	6.68	6.67	3.35	3	6.3
0.025	0.034	0.02	0.054	0.084	0.038	0.026	0.033	0.08	0.047	0.053	0.014	0.009	0.012	0.02	0.024	0.036
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
8.36	8.16	7.98	8.38	8.06	8.14	8.3	8.36	8.18	8.21	8.21	8.25	8.28	8.37	8.29	8.3	7.88
<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.003	0.004	0.003	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
87	75	79	66	36	46	48	47	49	120	76	84	99	75	70	70	44
458	410	450	427	291	361	370	370	333	471	410	465	491	441	419	427	340
		<0.5			<0.5			<0.5				<0.5			<0.5	
		108			103			101				92			101	
0.95	0.7	0.989	1.01	1.39	2.49	0.743	0.664	0.767	1.04	<0.8	0.559	0.677	1.17	0.722	0.838	0.796
0.015	0.018	0.082	0.011	0.01	0.011	0.008	0.008	0.05	0.024	0.036	0.013	0.006	0.009	0.01	0.011	0.02
7	5	<2	20	22	8	10	12	11	10	7	<2	6	68	3	3	17
		<0.2			<0.2			<0.2				<0.2			<0.2	
<0.01	<0.01	<0.01	0.02	<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
6.7	0.35	0	-0.1	1.3	7.1	6.9	9.9	22.15	19.7	15.3	10	3.51	0.9	0.01	0.8	6
6.52	8.09	8.08	7.39	7.89	7.65	8.51	8.25	8.62	8.52	8.39	8.92	9.09	7.89	NA [7]	8.35	8.04
703	611	678	29	410	539	579	550	493	697	616	684	679	630	NA [7]	532	456
10.91	11.69	12.76	14.83	11.94	13.36	11.83	15.45	6.9	6.7	9.4	9.91	12.89	14.3	15.82	13.96	11.89

							SWMC3 - All Data, Limited Samples						
262.00	**99.00**	**62.00**	**179.00**	**278.00**	**381.00**								
1553604.00	**1557472.00**	**1565634.00**	**1587660**	**1593969.00**	**1599825.00**								
SWMC3	**SWMC3**	**SWMC5**	**SWMC5**	**SWMC3**	**SWMC3**						SWMC3	SWMC3	
2021-04-23	**2021-05-14**	**2021-06-28**	**2021-10-05**	**2021-11-05**	**2021-12-03**			Standard			All Data	All Data	
							Mean	Deviation	Positive SD	negative SD	Median	90th %	N
	120			100			102.63	12.45	115.08	90.18	101.00	120.30	10.00
	<0.4			<0.4			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
	85			84			95.10	12.74	107.84	82.36	95.50	107.10	10.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
0.06	0.02	0.04	<0.01	0.01	0.01		0.06	0.16	0.22	-0.10	0.02	0.06	22.00
184	214	280	251	243	234		215.32	29.91	245.24	185.41	220.00	251.00	31.00
<0.001	<0.001	0.001	<0.001	<0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	2.00
0.05	0.03	0.92	0.73	0.03	0.02		0.08	0.20	0.28	-0.12	0.03	0.04	31.00
0.05	0.07	0.12	0.1	0.09	0.08		0.07	0.02	0.09	0.06	0.07	0.09	31.00
	<0.5			<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
78	110	110	104	137	124		101.58	17.06	118.64	84.52	104.00	121.00	31.00
2	2	3	3	2	1		3.17	1.69	4.86	1.48	3.00	6.00	29.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
50	28	130	99	34	35		34.84	22.43	57.27	12.41	29.00	35.00	31.00
<0.0002	<0.0002	0.0015	0.0013	0.0002	<0.0002		0.00	0.00	0.00	0.00	0.00	0.00	17.00
31	12	36	44	<5	25		19.47	9.43	28.90	10.03	16.50	35.10	30.00
638	577	1470	1280	805	725		670.29	208.79	879.08	461.50	631.00	756.00	31.00
<0.001	<0.001	0.003	0.003	<0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.002	0.001	0.003	0.003	0.002	0.002		0.00	0.00	0.00	0.00	0.00	0.00	28.00
	<4.0			<4.0			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
8.6	8.4	16.7	19.8	9.7	6.8		8.48	2.99	11.47	5.49	7.70	10.60	31.00
0.11	0.21	0.43	0.68	0.14	0.13		0.25	0.15	0.40	0.11	0.22	0.46	31.00
Y	Y	Y	Y	y	Y		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
236	332	419	363	416	371		310.55	56.44	366.99	254.11	317.00	368.00	31.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
5	2	43	30	4	3		5.03	8.62	13.65	-3.59	3.00	5.00	31.00
10	14	35	25	18	15		13.84	5.16	19.00	8.67	13.00	16.00	31.00
0.03	0.04	0.03	0.03	0.02	0.01		0.04	0.02	0.06	0.02	0.04	0.05	31.00
31	19	154	99	15	15		22.87	28.88	51.75	-6.01	16.00	22.00	31.00
2.8	<0.010	0.041	0.106	<0.010	<0.010		0.21	0.61	0.81	-0.40	0.05	0.12	21.00
0.080572957	NC	0.000109802	0.000210097	N/A	NC		0.01	0.02	0.03	-0.01	0.00	0.00	17.00
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
2.06	1.76	47.9	34.7	10.5	10.5		6.50	10.02	16.51	-3.52	3.35	10.50	31.00
0.083	0.019	0.109	0.131	0.017	0.017		0.04	0.03	0.08	0.01	0.03	0.08	31.00
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
8.07	8.36	7.9	8.04	7.98	8.19		8.20	0.16	8.36	8.04	8.21	8.37	31.00
<0.0010	<0.0010	<0.001	0.003	0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	8.00
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
61	56	90	96	95	68		68.10	23.17	91.27	44.92	68.00	96.00	31.00
415	375	956	832	523	471		435.65	135.77	571.41	299.88	410.00	491.00	31.00
	<0.5			<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
	114			85			99.70	8.22	107.92	91.48	101.00	108.60	10.00
8.01	0.798	2.46	2.78	0.994	0.447		1.28	1.39	2.67	-0.12	0.88	2.46	30.00
0.036	0.011	24	0.089	0.012	0.012		0.80	4.31	5.10	-3.51	0.01	0.07	31.00
9	13	0.07	30		2		12.15	13.07	25.21	-0.92	9.50	20.60	28.00
	<0.2			<0.2			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01	0.01	0.02	0.01	0.01	0.02	3.00
8.2	16.32	25.3	15.4	4.9	0.7		9.65	7.65	17.30	2.01	8.85	18.98	30.00
8.27	8.58	8.33	8.18	8.16	---[2]		8.06	0.57	8.63	7.48	8.16	8.60	27.00
556	566	678	750	805	---[2]		578.86	147.92	726.77	430.94	596.00	708.20	27.00
14.42	13.42	8.88	10.04	11.92	18.16		11.50	3.05	14.55	8.44	11.91	14.89	30.00

ce Water Station SWMC3															
						Environment									
		SWMC3 Stream Flow (L/sec)			CCME Surface	BC Surface	253.00	125.00	141.00	731.00	10.00	27.00	14.00	21.00	184.00
		Effluent Discharge (L/sec)			Water Quality	Water Quality	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							1428331.00	1431583.00	1434214.00	1440940.00	1446255.00		1455462.00	1459457.00	1460888.00
g digitally signed PDF version of the report for official results.							SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3	SWMC3
				PWQO (APV	Guideline -	Guideline -	2019-05-23	2019-06-06	2019-06-19	2019-07-12	2019-08-08	2019-9-4	2019-09-23	2019-10-10	2019-10-18
Analyte	Units	nalytical Metho	MRL	for Cl and Na)	Short/Long Term (mg/L)	Short/Long Term (mg/L)									
2-dichloroethane-d4 (	%	EPA 8260	0.00				100	102						95.3	
-dichlorobenzene (µg	ug/L	EPA 8260	0.40	4.00			<0.4	<0.4						<0.4	
romofluorobenzene (	%	EPA 8260	0.00				93	117						98	
Ag (mg/L)	mg/L	EPA 200.8	0.00				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	EPA 200.8	0.01				0.02	<0.01	<0.01	0.02	<0.01		<0.01	<0.01	0.09
alinity as CaCO3 (mg	mg/L	2320,2510,4500	5.00				210	219	228	147	195		186	207	172
As (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
B (mg/L)	mg/L	EPA 200.8	0.01	0.2*	29/1.5	ND/1.2	0.02	0.01	0.02	0.03	0.04		0.04	0.03	0.03
Ba (mg/L)	mg/L	EPA 200.8	0.01				0.06	0.07	0.08	0.09	0.08		0.08	0.07	0.05
Benzene (µg/L)	ug/L	EPA 8260	0.50	100.00	ND/370	ND/40	<0.5	<0.5						<0.5	
Ca (mg/L)	mg/L	SM3120B-3500	1.00				98	93	107	71	81		82	101	117
CBOD5 (mg/L)	mg/L	SM 5210B	1.00				2	5	3	<1	2		<1	5	3
Cd (mg/L)	mg/L	EPA 200.8	0.00	0.00	.001/.00009	calculation	<0.0001	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	SM 4110	1.00		640/120	600/150	24	29	28	19	35		34	35	23
Co (mg/L)	mg/L	EPA 200.8	0.00			0.110/0.004	0.0003	<0.0002	<0.0002	0.0004	<0.0002		0.0004	<0.0002	0.0006
COD (mg/L)	mg/L	C SM5220D	5.00				15	14	7	36	8		21	11	35
Conductivity (µmho/cm	uS/cm	C SM2510B	5.00				500	520	629	473	578		564	621	728
Cr (mg/L)	mg/L	EPA 200.8	0.00	0.01	ND/.001		0.001	<0.001	<0.001	<0.001	0.001		<0.001	<0.001	<0.001
Cu (mg/L)	mg/L	EPA 200.8	0.00		ND/.004	0.029/≤0.002	0.002	0.001	0.001	0.003	0.002		0.002	0.001	0.003
ichloromethane (µg/L	ug/L	EPA 8260	4.00	100.00	ND/9811		<4.0	<4.0						<4.0	
DOC (mg/L)	mg/L	ONTRACT-E-IN	0.50				8.1	7.9	7.6	11.5	6.5		6.8	5.8	10.6
Fe (mg/L)	mg/L	EPA 200.8	0.03	0.30	ND/0.3	0.001/ND	0.32	0.25	0.18	0.52	0.15		0.46	0.11	0.22
Filtration		EPA 200.8					Y	Y	Y	Y	Y		Y	Y	Y
dness as CaCO3 (mg	mg/L	C SM2340B	1.00				290	278	317	210	252		258	314	358
Hg (mg/L)	mg/L	EPA 200.8	0.00	0.00	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	SM3120B-3500	1.00				2	2	2	4	3		4	4	5
Mg (mg/L)	mg/L	SM3120B-3500	1.00				11	11	12	8	12		13	15	16
Mn (mg/L)	mg/L	EPA 200.8	0.01				0.04	0.04	0.02	0.07	0.03		0.11	0.01	0.04
Na (mg/L)	mg/L	SM3120B-3500	2.00	180.00			12	14	12	9	21		17	18	9
N-NH3 (mg/L)	mg/L	UBCONTRACT-	0.01				0.01	0.033	0.06	0.09	0.038		0.08	0.02	0.04
Unionized - calculated) (mg/L)				0.02							0.001188571		0.004723209	0.001068785	0.000266406
N-NO2 (mg/L)	mg/L	SM 4110	0.10			0.6/0.2	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (mg/L)	mg/L	SM 4110	0.10		124/3.0	32.8/3.0	2.74	2.03	3.8	9.24	1.48		0.12	1.27	12.4
P - Total (mg/L)	mg/L	EPA 200.8	0.00	0.03			0.016	0.019	0.024	0.124	0.043		0.078	0.016	0.042
Pb (mg/L)	mg/L	EPA 200.8	0.00	0.03	ND/.007	0.003/ND	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
pH		SM2320,2510,4500	1.00				8.32	8.27	8.17	8.2	8.49		8.24	8.41	7.88
Phenols (mg/L)	mg/L	UBCONTRACT-	0.00	0.00	ND/0.004	.050/ND	<0.001	<0.001	<0.001	<0.001	<0.001		0.006	<0.001	<0.001
Se (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	SM 4110	1.00			429.00	46	42	48	34	55		56	70	123
S (COND - CALC) (m	mg/L	C SM2540	1.00				325	338	409	307	376		367	404	473
Toluene (µg/L)	ug/L	EPA 8260	0.50	0.80	ND/.002	ND/0.0005	<0.5	<0.5						<0.5	
Toluene-d8 (%)	%	EPA 8260	0.00				97	102						94	
l Kjeldahl Nitrogen (m	mg/L	UBCONTRACT-	0.15				0.7	0.84	0.91	1.48	0.93		0.7	0.52	1.19
otal P - Soluble (mg/L	mg/L	EPA 200.8	0.00				0.007	0.0097	0.013	0.066	0.036		0.021	0.009	0.018
Suspended Solids (r	mg/L	C SM2540	2.00				3	3	18	20	6		14	3	10
Vinyl Chloride	ug/L	EPA 8260	0.20	600.00			<0.2	<0.2						<0.2	
Zn (mg/L)	mg/L	EPA 200.8	0.01	0.03	.037/.007	0.033/0.0075	<0.01	0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01
												Field Measurements and Flow only			
Field Data															
Temperature							13.5	12.8	17.3	18.3		17.95	18.9		9.5
pH							8.44	7.16	7.11	7.92		7.61	meter failure		7.58
Conductivity							442.1	596	639	496		499	meter failure		716
ssolved Oxygen (mg/L)							13.25	12.06	6.51	7.07		7.92	6.6		10.15

513.00	**373.00**	**104.10**	**0.00**	**1211.73**	**630.33**	**70.17**	**49.09**	**33.50**	**99.21**	**9.89**	**46.00**	**134.88**	**185.29**	**78.00**	**101.00**	**909.00**
0.00	0.00															
1464888.00	**1471806.00**	**1475064.00**	**1480018.00**	**1485320.00**	**1487993.00**	**1492680.00**	**1493692.00**	**1507651.00**	**1508126.00**	**1513034.00**	**1521862.00**	**1526423.00**	**1533877.00**	**1538404.00**	**1543602.00**	**1548376.00**
SWMC3	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**	**SWMC3**
2019-11-06	**2019-12-11**	**2020-01-10**	**2020-02-14**	**2020-03-17**	**2020-04-07**	**2020-05-08**	**2020-05-14**	**2020-07-30**	**2020-08-04**	**2020-08-26**	**2020-10-13**	**2020-11-03**	**2020-12-09**	**2021-01-14**	**2021-02-25**	**2021-03-30**
		83			106			108				89			123	
		<0.4			<0.4			<0.4				<0.4			<0.4	
		102			103			90				106			73	
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
0.05	0.05	0.77	0.01	0.03	0.02	0.02	0.01	<0.01	0.02	<0.01	0.01	0.02	0.03	0.01	<0.01	0.04
206	222	243	241	175	185	221	227	170	210	229	255	255	238	223	220	185
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
0.03	0.04	0.02	0.02	0.01	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02
0.08	0.07	0.07	0.08	0.04	0.05	0.06	0.06	0.06	0.08	0.07	0.08	0.07	0.07	0.07	0.07	0.05
		<0.5			<0.5			<0.5				<0.5			<0.5	
122	102	117	110	73	86	96	89	74	119	92	112	121	116	110	110	87
1	4	3	6	7	2	2	3	7	3	3	6	3	4	2	2	1
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
25	26	32	32	18	27	27	28	31	28	31	33	32	26	28	32	21
0.0005	0.0004	0.0003	0.0005	0.0003	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0004	0.0002	<0.0002	0.0002
25	13	15	15	17	15	20	16	18	31	18	10	12	18	10	14	22
705	631	692	657	447	555	570	570	513	725	631	715	756	679	645	657	523
<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	<0.001	0.002	<0.001	0.001	0.002	0.001	0.001	<0.001	0.002
		<4.0			<4.0			<4.0				<4.0			<4.0	
9.8	8	6.8	7.7	8.2	7.2	7.6	7.1	8.7	10	6.8	6.5	6.7	6.6	6.7	5.2	8.4
0.2	0.22	0.22	0.56	0.32	0.23	0.37	0.32	0.18	0.13	0.1	0.06	0.19	0.22	0.21	0.2	0.22
Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
366	308	346	328	211	252	289	263	226	363	287	337	368	347	332	332	258
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
3	3	2	2	2	3	2	2	2	4	3	4	3	2	2	2	2
15	13	13	13	7	9	12	10	10	16	14	14	16	14	14	14	10
0.04	0.04	0.04	0.07	0.04	0.04	0.05	0.05	0.05	0.03	0.04	0.01	0.01	0.04	0.05	0.04	0.03
12	12	15	17	14	16	16	15	19	17	22	17	16	13	16	18	9
0.036	0.015	0.049	0.118	0.071	0.569	<0.010	<0.010	<0.010	0.035	0.06	<0.010	<0.010	<0.010	0.023	0.05	<0.010
1.6817E-05	0.000152953	0.000474334	0.000233062	0.000492167	0.0037	NC	NC	NC	0.003938733	0.00380613	N/A	N/A	N/A	0.000359228	0.000954832	NC
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
9.69	4.75	3.41	1.93	2.89	3.52	1.45	1.03	0.23	4.04	0.47	1.49	6.68	6.67	3.35	3	6.3
0.025	0.034	0.02	0.054	0.084	0.038	0.026	0.033	0.08	0.047	0.053	0.014	0.009	0.012	0.02	0.024	0.036
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
8.36	8.16	7.98	8.38	8.06	8.14	8.3	8.36	8.18	8.21	8.21	8.25	8.28	8.37	8.29	8.3	7.88
<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.003	0.004	0.003	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
87	75	79	66	36	46	48	47	49	120	76	84	99	75	70	70	44
458	410	450	427	291	361	370	370	333	471	410	465	491	441	419	427	340
		<0.5			<0.5			<0.5				<0.5			<0.5	
		108			103			101				92			101	
0.95	0.7	0.989	1.01	1.39	2.49	0.743	0.664	0.767	1.04	<0.8	0.559	0.677	1.17	0.722	0.838	0.796
0.015	0.018	0.082	0.011	0.01	0.011	0.008	0.008	0.05	0.024	0.036	0.013	0.006	0.009	0.01	0.011	0.02
7	5	<2	20	22	8	10	12	11	10	7	<2	6	68	3	3	17
		<0.2			<0.2			<0.2				<0.2			<0.2	
<0.01	<0.01	<0.01	0.02	<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
6.7	0.35	0	-0.1	1.3	7.1	6.9	9.9	22.15	19.7	15.3	10	3.51	0.9	0.01	0.8	6
6.52	8.09	8.08	7.39	7.89	7.65	8.51	8.25	8.62	8.52	8.39	8.92	9.09	7.89	NA [7]	8.35	8.04
703	611	678	29	410	539	579	550	493	697	616	684	679	630	NA [7]	532	456
10.91	11.69	12.76	14.83	11.94	13.36	11.83	15.45	6.9	6.7	9.4	9.91	12.89	14.3	15.82	13.96	11.89

							SWMC3 - All Data, Limited Samples						
262.00	**99.00**	**62.00**	**179.00**	**278.00**	**381.00**								
1553604.00	**1557472.00**	**1565634.00**	**1587660**	**1593969.00**	**1599825.00**								
SWMC3	**SWMC3**	**SWMC5**	**SWMC5**	**SWMC3**	**SWMC3**						SWMC3	SWMC3	
2021-04-23	**2021-05-14**	**2021-06-28**	**2021-10-05**	**2021-11-05**	**2021-12-03**						All Data	All Data	
							Mean	andard Deviatio	Positive SD	negative SD	Median	90th %	N
	120			100			102.63	12.45	115.08	90.18	101.00	120.30	10.00
	<0.4			<0.4			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
	85			84			95.10	12.74	107.84	82.36	95.50	107.10	10.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
0.06	0.02	0.04	<0.01	0.01	0.01		0.06	0.16	0.22	-0.10	0.02	0.06	22.00
184	214	280	251	243	234		215.32	29.91	245.24	185.41	220.00	251.00	31.00
<0.001	<0.001	0.001	<0.001	<0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	2.00
0.05	0.03	0.92	0.73	0.03	0.02		0.08	0.20	0.28	-0.12	0.03	0.04	31.00
0.05	0.07	0.12	0.1	0.09	0.08		0.07	0.02	0.09	0.06	0.07	0.09	31.00
	<0.5			<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
78	110	110	104	137	124		101.58	17.06	118.64	84.52	104.00	121.00	31.00
2	2	3	3	2	1		3.17	1.69	4.86	1.48	3.00	6.00	29.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
50	28	130	99	34	35		34.84	22.43	57.27	12.41	29.00	35.00	31.00
<0.0002	<0.0002	0.0015	0.0013	0.0002	<0.0002		0.00	0.00	0.00	0.00	0.00	0.00	17.00
31	12	36	44	<5	25		19.47	9.43	28.90	10.03	16.50	35.10	30.00
638	577	1470	1280	805	725		670.29	208.79	879.08	461.50	631.00	756.00	31.00
<0.001	<0.001	0.003	0.003	<0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.002	0.001	0.003	0.003	0.002	0.002		0.00	0.00	0.00	0.00	0.00	0.00	28.00
	<4.0			<4.0			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
8.6	8.4	16.7	19.8	9.7	6.8		8.48	2.99	11.47	5.49	7.70	10.60	31.00
0.11	0.21	0.43	0.68	0.14	0.13		0.25	0.15	0.40	0.11	0.22	0.46	31.00
Y	Y	Y	Y	y	Y		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
236	332	419	363	416	371		310.55	56.44	366.99	254.11	317.00	368.00	31.00
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
5	2	43	30	4	3		5.03	8.62	13.65	-3.59	3.00	5.00	31.00
10	14	35	25	18	15		13.84	5.16	19.00	8.67	13.00	16.00	31.00
0.03	0.04	0.03	0.03	0.02	0.01		0.04	0.02	0.06	0.02	0.04	0.05	31.00
31	19	154	99	15	15		22.87	28.88	51.75	-6.01	16.00	22.00	31.00
2.8	<0.010	0.041	0.106	<0.010	<0.010		0.21	0.61	0.81	-0.40	0.05	0.12	21.00
0.080572957	NC	0.000109802	0.000210097	N/A	NC		0.01	0.02	0.03	-0.01	0.00	0.00	17.00
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
2.06	1.76	47.9	34.7	10.5	10.5		6.50	10.02	16.51	-3.52	3.35	10.50	31.00
0.083	0.019	0.109	0.131	0.017	0.017		0.04	0.03	0.08	0.01	0.03	0.08	31.00
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
8.07	8.36	7.9	8.04	7.98	8.19		8.20	0.16	8.36	8.04	8.21	8.37	31.00
<0.0010	<0.0010	<0.001	0.003	0.001	<0.001		0.00	0.00	0.00	0.00	0.00	0.00	8.00
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
61	56	90	96	95	68		68.10	23.17	91.27	44.92	68.00	96.00	31.00
415	375	956	832	523	471		435.65	135.77	571.41	299.88	410.00	491.00	31.00
	<0.5			<0.5			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
	114			85			99.70	8.22	107.92	91.48	101.00	108.60	10.00
8.01	0.798	2.46	2.78	0.994	0.447		1.28	1.39	2.67	-0.12	0.88	2.46	30.00
0.036	0.011	24	0.089	0.012	0.012		0.80	4.31	5.10	-3.51	0.01	0.07	31.00
9	13	0.07	30		2		12.15	13.07	25.21	-0.92	9.50	20.60	28.00
	<0.2			<0.2			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.01	0.01	0.02	0.01	0.01	0.02	3.00
8.2	16.32	25.3	15.4	4.9	0.7		9.65	7.65	17.30	2.01	8.85	18.98	30.00
8.27	8.58	8.33	8.18	8.16	---[2]		8.06	0.57	8.63	7.48	8.16	8.60	27.00
556	566	678	750	805	---[2]		578.86	147.92	726.77	430.94	596.00	708.20	27.00
14.42	13.42	8.88	10.04	11.92	18.16		11.50	3.05	14.55	8.44	11.91	14.89	30.00

Surface Water Station SWMC5					CCME Surface Water Quality Guideline - Short/Long Term (mg/L)	Environment BC Surface Water Quality Guideline - Short/Long Term (mg/L)								
		Lab ID					1492670	1493683	1507640	1508115	1513024	1521852	1526413	1533865
		Station ID					SWMC5	SWMC5	SWMC5	SWMC5	SWMC5	SWMC5	SWMC5	SWMC5
		Date					2020-05-08	2020-05-14	2020-07-30	2020-08-04	2020-08-26	2020-10-13	2020-11-03	2020-12-09
Analyte	**Units**	**Analytical Method**	**MRL**	PWQO (APV for Cl and Na)										
,2-dichloroethane-d4 (%)									106				89	
4-dichlorobenzene (µg/L)				4.00					<0.4				<0.4	
bromofluorobenzene (%)									90				102.3	
Ag (mg/L)	mg/L	EPA 200.8	0.00				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L)	mg/L	EPA 200.8	0.01				0.12	0.17	0.45	0.24	0.11	0.34	0.02	0.04
kalinity as CaCO3 (mg/	mg/L	2320,2510,4500	5.00				228	250	184	217	244	293	265	256
As (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	0.002	0.002	0.002	<0.001	<0.001	<0.001
B (mg/L)	mg/L	EPA 200.8	0.01	0.2*	29/1.5	ND/1.2	0.92	0.96	0.56	0.54	0.67	0.76	0.73	0.57
Ba (mg/L)	mg/L	EPA 200.8	0.01				0.08	0.07	0.08	0.08	0.09	0.08	0.08	0.08
Benzene (µg/L)				100.00	ND/370	ND/40			<0.5				<0.5	
Ca (mg/L)	mg/L	SM3120B-3500	1.00				75	70	71	87	82	94	105	115
CBOD5 (mg/L)	mg/L	SM 5210B	1.00				1	3	6	2	5	7	5	5
Cd (mg/L)	mg/L	EPA 200.8	0.00	0.00020	.001/.00009	calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	mg/L	SM 4110	1.00		640/120	600/150	137	134	94	93	104	126	111	124
Co (mg/L)	mg/L	EPA 200.8	0.0002			0.110/0.004	0.0013	0.0014	0.0018	0.0014	0.0011	0.0013	0.0012	0.0011
COD (mg/L)	mg/L	C SM5220D	5.00				69	66	70	72	76	44	44	50
Conductivity (µmho/cm)	uS/cm	2320,2510,4500	5.00				1430	1460	1050	1110	1230	1370	1380	1320
Cr (mg/L)	mg/L	EPA 200.8	0.0010	0.0089	ND/.001		0.003	0.003	0.004	0.003	0.003	0.003	0.002	0.003
Cu (mg/L)	mg/L	EPA 200.8	0.0010		ND/.004	0.029/≤0.002	0.002	0.003	0.006	0.007	0.003	0.003	0.002	0.003
Dichloromethane (µg/L)				100.00	ND/9811				<4.0				<4.0	
DOC (mg/L)	mg/L	SM 5310B	0.50				26.7	26.2	25.5	25.5	21.4	17.1	18	18
Fe (mg/L)	mg/L	EPA 200.8	0.03	0.30	ND/0.3	0.001/ND	0.36	0.31	1.41	0.97	0.79	0.56	0.47	0.42
Filtration		EPA 200.8					Y	Y	Y	Y	Y	Y	Y	Y
ardness as CaCO3 (mg/	mg/L	C SM2340B	1.00				303	274	256	308	299	342	369	398
Hg (mg/L)	mg/L	EPA 200.8	0.00	0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	mg/L	SM3120B-3500	1.00				47	42	29	28	32	33	35	32
Mg (mg/L)	mg/L	SM3120B-3500	1.00				28	24	19	22	23	26	26	27
Mn (mg/L)	mg/L	EPA 200.8	0.01				0.06	0.06	0.1	0.11	0.05	0.04	0.04	0.06
Na (mg/L)	mg/L	SM3120B-3500	2.00	180.00			160	153	99	110	126	129	127	104
N-NH3 (mg/L)	mg/L	EPA 350.1	0.01				<0.010	0.027	1.5	0.12	0.13	0.013	0.121	0.143
(Unionized - calculated) (mg/L)				0.02000			NC	2.71212E-05	0.001032844	0.02480231	3.52822E-05	0.000648301	0.000116519	1.3102E-05
N-NO2 (mg/L)	mg/L	SM 4110	0.10			0.6/0.2	<0.10	<0.10	0.13	<0.10	0.14	<0.10	<0.50	<0.10
N-NO3 (mg/L)	mg/L	SM4500-NO3-	0.10		124/3.0	32.8/3.0	45.1	46.1	24.4	25.8	27.8	36.9	44	45.5
P - Total (mg/L)	mg/L	EPA 200.8	0.002	0.030			0.069	0.052	0.351	0.238	0.252	0.096	0.088	0.075
Pb (mg/L)	mg/L	EPA 200.8	0.0010	0.0250	ND/.007	0.003/ND	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	0.002
pH		SM2320,2510,4500	1.00				8.33	8.32	7.92	7.99	8.07	8.23	8.2	8.3
Phenols (mg/L)	mg/L	CONTRACT P-IN	0.0010	0.0010	ND/0.004	.050/ND	<0.001	<0.004	0.008	0.007	0.005	<0.004	<0.001	0.003
Se (mg/L)	mg/L	EPA 200.8	0.00				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SO4 (mg/L)	mg/L	SM 4110	1.00			429.00	98	102	102	117	117	109	109	110
S (COND - CALC) (mg	mg/L	C SM2540	1.00				930	949	682	722	800	890	897	858
Toluene (µg/L)		EPA 351.2	0.10	0.80	ND/.002	ND/0.0005			<0.5				<0.5	
Toluene-d8 (%)		EPA 200.8	0.00						103				103	
al Kjeldahl Nitrogen (mg/L)		C SM2540	2.00				3.08	3.63	5.57	3.46	2.8	2.6	2.17	2.91
Total P - Soluble (mg/L)		EPA 200.8	0.01				0.027	0.032	0.15	0.08	0.164	0.102	0.045	0.048
al Suspended Solids (mg/L)							20	42	91	96	46	39	22	35
Vinyl Chloride				600.00					<0.2				<0.2	
Zn (mg/L)				0.03	.037/.007	0.033/0.0075	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01
Field Data														
Temperature							9.1	8.8	20.49	20.1	16	9.9	1.48	0.6
pH							8.52	6.78	6.23	8.82	5.97	8.46	7.02	6.03
Conductivity							1462	1388	990	1236	1170	1304	1232	1251
Dissolved Oxygen (mg/L)							9.78	15.33	6.64	4.41	7.98	8.62	12.48	13.49

										SWMC5	All Data: 2020-05-08 to Dec. 3, 2021				
1538393	1543594	1548364	1553592	1557482	1565634	1569093	1587660	1593959	1599814	Mean	Standard	Positive SD	negative SD	Median	90th %
SWMC5	SWMC5	SWMC5	SWMC5	SWMCS	SWMC5	SWMC5	SWMC5	SWMC5	SWMC5						
2021-01-14	2021-02-25	2021-03-30	2021-04-23	2021-05-14	2021-06-28	2021-07-15	2021-10-05	2021-11-04	2021-12-03						
	125			119				112		110.20	13.85	124.05	96.35	112.00	122.60
	<0.4			<0.4				<0.4		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
	86			84				71		86.66	11.28	97.94	75.38	86.00	97.38
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
0.06	0.09	0.04	0.08	0.12	0.04	0.09	<0.01	0.04	0.02	0.12	0.12	0.24	0.00	0.09	0.28
195	209	181	175	241	280	223	251	255	248	233.06	34.08	267.13	198.98	242.50	269.50
<0.001	0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00
1.1	1.4	0.13	0.06	1.5	0.92	0.51	0.73	0.72	0.31	0.73	0.38	1.11	0.35	0.73	1.19
0.14	0.13	0.05	0.05	0.11	0.12	0.08	0.1	0.09	0.07	0.09	0.02	0.11	0.06	0.08	0.12
	<0.5			<0.5				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
97	84	82	71	97	110	90	104	125	112	92.83	16.53	109.36	76.30	92.00	112.90
4	2	2	<1	1	3	<1	3	<1	<1	3.50	1.87	5.37	1.63	3.00	5.70
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
180	230	49	45	190	130	115	99	110	64	118.61	46.85	165.46	71.76	113.00	183.00
0.0017	0.0014	0.0005	0.0002	0.0022	0.0015	0.0008	0.0013	0.0012	0.0011	0.0013	0.0005	0.0017	0.0008	0.0013	0.0017
60	63	32	57	74	36	29	44	23	55	53.56	16.57	70.12	36.99	56.00	72.60
1790	1940	685	622	1890	1470	967	1280	1390	969	1297.39	363.90	1661.28	933.49	1345.00	1820.00
0.005	0.004	<0.001	<0.001	0.006	0.003	0.002	0.003	0.003	0.003	0.0033	0.0010	0.0043	0.0023	0.0030	0.0045
0.002	0.001	0.003	0.002	0.003	0.003	0.004	0.003	0.002	0.003	0.0031	0.0014	0.0045	0.0016	0.0030	0.0046
	<4.0			<4.0				<4.0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
25	24.6	15.6	13.1	35	16.7	17.9	19.8	20.3	13.3	21.09	5.63	26.73	15.46	20.05	26.35
0.78	0.33	0.49	0.32	0.38	0.43	0.54	0.68	0.33	1.08	0.59	0.31	0.90	0.28	0.48	1.00
Y	Y	Y	Y	Y	Y	y	Y	y	Y	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
395	366	258	223	395	419	311	363	436	374	338.28	61.72	400.00	276.56	352.50	404.30
<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
63	68	8	4	74	43	19	30	36	16	35.50	18.92	54.42	16.58	32.50	64.50
37	38	13	11	37	35	21	25	30	23	25.83	7.65	33.48	18.18	25.50	37.00
0.08	0.04	0.05	0.04	0.04	0.03	0.06	0.03	0.03	0.08	0.06	0.02	0.08	0.03	0.05	0.09
188	223	39	31	250	154	72	99	127	64	125.28	57.83	183.11	67.45	126.50	198.50
0.201	2.36	0.388	1.98	0.04	0.041	0.128	0.106	0.095	0.089	0.44	0.74	1.18	-0.30	0.12	1.69
0.001987738	0.000741863	0.000163342	0.000897759	0.006030949	0.000109802	0.009752474	0.000210097	0.002596305	0.000828262	0.00294	0.00619	0.00914	-0.00325	0.00074	0.00752
<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	0.14	0.01	0.14	0.13	0.14	0.14
80.6	85.1	12.7	2.52	89.5	47.9	26.1	34.7	43	20.9	41.03	23.81	64.84	17.23	39.95	81.95
0.116	0.109	0.101	0.059	0.091	0.109	0.109	0.131	0.084	0.108	0.124	0.077	0.202	0.047	0.105	0.242
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.0006	0.0019	0.0008	0.0010	0.0018
8.1	8.11	7.76	8.05	8.09	7.9	7.74	8.04	7.95	7.99	8.06	0.17	8.23	7.89	8.06	8.31
0.003	<0.001	0.003	<0.0010	<0.010	<0.001	0.004	0.003	0.002	0.001	0.0039	0.0022	0.0061	0.0017	0.0030	0.0071
<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
112	130	54	64	110	90	80	96	110	90	100.00	18.98	118.98	81.02	105.50	117.00
1160	1260	445	404	1230	956	629	832	904	630	843.22	236.35	1079.57	606.88	874.00	1181.00
	<0.5			<0.5				<0.5		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
	101			112				109		105.60	4.67	110.27	100.93	103.00	110.80
3.14	5.33	1.8	3.22	3.32	2.46	2.16	2.78	2.62	1.72	3.04	1.03	4.07	2.02	2.86	4.14
0.041	0.041	0.071	0.027	0.053	0.07	0.055	0.089	0.066	0.053	0.07	0.04	0.11	0.03	0.05	0.12
39	21	34	19	38	24	54	30	13	72	40.83	23.84	64.67	16.99	36.50	77.70
	<0.2			<0.2				<0.2		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!
0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.01	0.01	0.02
-0.29	-0.07	2.6	3.5	12.84	22.1	19.8	13.4	6.1	2	9.36	7.86	17.22	1.50	8.95	20.22
NA [7]	6.59	6.62	6.62	8.89	6.77	8.33	6.92	8.32	---[2]	7.31	1.05	8.35	6.26	6.85	8.67
NA [7]	1618	589	562	1816	1441	960	1269	1383	---[2]	1229.44	330.59	1560.03	898.85	1260.00	1540.00
14.95	22.00	12.31	13.42	9.31	6.28	6.20	9.32	12.31	17.02	11.21	4.46	15.67	6.75	11.05	15.84

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Surface Water Station SWT1	Measured / Estimated Flow (L/sec)			Reglated Effluent				2.30	2.10		17.00	4.60		
								0.00	0.00	0.00	0.00	0.00		
		LAB ID:		Parameter				1428324.00	1431588.00		1464893.00	1471809.00	**1485314.00**	**1487987.00**
		Station		mg/L				SWT1	SWT1		SWT1	SWT1	**SWT1**	**SWT1**
		Date Sampled:						2019-05-23	2019-06-06	43712.00	2019-11-06	2019-12-11	**2020-03-17**	**2020-04-07**
Analyte	PARAMETER	PWQO	MRL		**PWQO (APV**	**CCME Surface**	**Environment BC**							
-dichloroethane-d4 (%)								97.00	96.00					103.00
-dichlorobenzene (µg/L)								<0.4	<0.4					<0.4
romofluorobenzene (%)					4			93.00	112.00					106.00
Ag (mg/L)	Silver	0.0001	0.0001					<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Al (dissolved) (mg/L	Al (dissolved)	0.075*	0.01					<0.01	<0.01		<0.01	0.02	0.02	<0.01
alinity as CaCO3 (m	kalinity as CaCO3		5					387.00	359.00		296.00	254.00	201.00	261.00
As (mg/L)	Arsenic	0.1	0.001					0.00	0.00		<0.001	<0.001	<0.001	<0.001
B (mg/L)	Boron	0.2*	0.01					0.13	0.14		0.13	0.09	0.04	0.08
Ba (mg/L)	Barium		0.01		0.2*	29/1.5	ND/1.2	0.05	0.05		0.06	0.06	0.03	0.05
Benzene (µg/L)								<0.5	<0.5					<0.5
Ca (mg/L)	Calcium		1		100	ND/370	ND/40	148.00	133.00		151.00	122.00	72.00	130.00
CBOD5 (mg/L)	mical Oxygen Demand		1	10.0				3.00	8.00		1.00	5.00	42.00	3.00
Cd (mg/L)	Cadmium	0.0002	0.0001					<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Cl (mg/L)	Chloride		1		0.0002	.001/.00009	calculation	147.00	201.00		72.00	23.00	105.00	75.00
Co (mg/L)	Cobalt	0.0009	0.0002			640/120	600/150	<0.0002	<0.0002		<0.0002	0.0003	0.0007	<0.0002
COD (mg/L)	ical Oxygen Demand		5				0.110/0.004	36.00	31.00		40.00	50.00	115.00	46.00
onductivity (µmho/cn	nductivity (µS/cm)		5					1330.00	1430.00		1240.00	1160.00	827.00	1040.00
Cr (mg/L)	Chromium (total	0.0089**	0.001					0.00	<0.001		<0.001	0.00	<0.001	<0.001
Cu (mg/L)	Copper	0.005	0.001	0.2	0.0089	ND/.001		0.0020	0.0020		0.0030	0.0060	0.0030	0.0030
ichloromethane (µg/L)						ND/.004	0.029/≤0.002	<4.0	<4.0					<4.0
DOC (mg/L)	olved Organic Carbon		0.50		100	ND/9811		13.00	11.80		19.10	17.70	19.60	19.90
Fe (mg/L)	Iron	0.3	0.03	1.0	0.3	ND/0.3	0.001/ND	0.07	0.12		0.12	0.40	0.24	0.16
Filtration								Y	Y		Y	Y	Y	
dness as CaCO3 (m	rdness as CaCO3		1					534.00	509.00		521.00	424.00	229.00	436.00
Hg (mg/L)	Mercury	0.0002	0.0001		0.0002	ND/.000026	ND/calculation	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
K (mg/L)	Potassium		1					9.00	9.00		8.00	7.00	8.00	5.00
Mg (mg/L)	Magnesium		1					40.00	43.00		35.00	29.00	12.00	27.00
Mn (mg/L)	Manganese		0.01					0.02	0.12		0.01	0.03	0.30	0.03
Na (mg/L)	Sodium		2		180			107.00	140.00		63.00	72.00	69.00	55.00
N-NH3 (mg/L)	-NH3 (Ammonia)		0.02	1.0				0.04	0.04		<0.010	0.16	5.71	0.30
Unionized - calculate	un-ionized Amm	0.02			0.0200						NA	0.0048	0.0298	0.0004
N-NO2 (mg/L)	N-NO2 (Nitrite)		0.10				0.6/0.2	<0.10	<0.10		<0.10	<0.10	<0.10	<0.10
N-NO3 (mg/L)	N-NO3 (Nitrate)		0.10			124/3.0	32.8/3.0	3.38	0.34		8.09	4.22	0.42	4.10
P - Total (mg/L)	otal Phosphoru	0.03*	0.01	0.3	0.030			0.302	0.352		0.123	0.295	2.080	0.197
Pb (mg/L)	Lead	0.025	0.001		0.025	ND/.007	0.003/ND	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001
pH	pH (pH units)	6.5-8.5						8.22	8.11		8.27	7.79	7.65	7.85
Phenols (mg/L)	Phenols	0.001	0.001	0.005	0.0010	ND/0.004	.050/ND	0.003	<0.001		<0.001	0.007	0.010	<0.001
Se (mg/L)	Selenium	0.1	0.001					<0.001	<0.001		0.00	<0.001	<0.001	<0.001
SO4 (mg/L)	Sulphate		1				429	182.00	183.00		213.00	36.00	50.00	162.00
S (COND - CALC) (m	S (COND - CALC)		5					864.00	930.00		806.00	754.00	538.00	676.00
Toluene (µg/L)					0.8	ND/.002	ND/0.0005	<0.5	<0.5					<0.5
Toluene-d8 (%)								95.00	105.00					104.00
Kjeldahl Nitrogen (ra	l Kjeldahl Nitrogen		0.10					1.60	1.74		1.62	2.00	13.80	2.93
otal P - Soluble (mg/L)								0.22	0.27		0.12	12.00	1.48	0.20
Suspended Solids (a	l Suspended Solids		2	10.0	600			14.00	44.00		3.00	0.13	30.00	19.00
								<0.2	<0.2					<0.2
Zn (mg/L)	Zinc	0.03	0.01	0.2	0.03	.037/.007	0.033/0.0075	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01
Field Data	Field Data:													
Temperature	Temperature (ºC)							13.70	21.70	23.50	6.20	0.23	0.80	5.80
pH	H (field) (pH unit	6.5-8.5						7.63	7.89	7.82	7.46	8.58	7.78	7.03
Conductivity	uctivity (field) (µS/cm)							1158.00	1602.00	767.00	1202.00	1106.00	788.00	990.00
ssolved Oxygen (mg	issolved Oxygen			4.00				8.73	20.28	5.10	10.68	meter frozen	4.08	11.62

Measured / Estimated Flow (L/sec)							
	LAB ID:		**1533871.00**	**1548370.00**	**1553598.00**	**1569099.00**	**1599820.00**
	Station		**SWT1**	**SWT1**	**SWT1**	**SWT1**	**SWT1**
Date Sampled:			**2020-12-09**	**2021-03-30**	**2021-04-23**	**2021-07-15**	**2021-12-03**
PARAMETER	PWQO	MRL					
%)							
g/L)							
(%)							
Silver	0.0001	0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Al (dissolved)	0.075*	0.01	<0.01	0.04		0.04	0.26
kalinity as CaCO3		5	365.00	275.00		327.00	269.00
Arsenic	0.1	0.001	<0.001	0.00	0.002	0.001	0.00
Boron	0.2*	0.01	0.14	0.10	0.09	0.16	0.13
Barium		0.01	0.06	0.04	0.05	0.06	0.05
Calcium		1	171.00	121.00	131.00	100.00	137.00
mical Oxygen Demand		1	3.00	2.00	<1	<1	<1
Cadmium	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride		1	79.00	67.0000	107.00	59.00	51.00
Cobalt	0.0009	0.0002	0.0002	<0.0002	<0.0002	0.0003	0.00
ical Oxygen Demand		5	61.00	52.0000	57.00	18.00	72.00
nductivity (µS/cm)		5	1270.00	969.00	1200.00	889.0000	995.00
Chromium (total	0.0089**	0.001	<0.001	<0.001	<0.001	0.001	0.00
Copper	0.005	0.001	0.0020	0.003	0.002	0.01	0.00
-)							
lved Organic Carbon		0.50	20.30	22.30	22.90	13.60	23.30
Iron	0.3	0.03	0.22	0.15	0.23	0.4700	0.60
			Y	Y	Y	y	Y
rdness as CaCO3		1	588.00	409.00	447.00	349.00	470.00
Mercury	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Potassium		1	6.00	5.000	6.00	8.00	7.00
Magnesium		1	39.00	26.00	29.00	24.00	31.00
Manganese		0.01	0.03	0.01	0.03	0.13	0.08
Sodium		2	62.00	49.00	69.00	51.00	47.00
-NH3 (Ammonia)		0.02	<0.010	0.22	0.07	0.05	0.4990
un-ionized Amm	0.02		N/A	0.00089	0.00067	0.001	0.00201
N-NO2 (Nitrite)		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.10	5.86	5.11	1.89	5.6100	5.25
otal Phosphoru	0.03*	0.01	0.198	0.30	0.71	0.22	0.405
Lead	0.025	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
pH (pH units)	6.5-8.5		8.12	7.61	8.11	7.46	7.66
Phenols	0.001	0.001	0.004	0.004	<0.0010	0.002	0.00
Selenium	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate		1	218.00	129.00	148.00	95.00	174.00
S (COND - CALC)		5	826.00	630.00	780.00	578.00	647.00
al Kjeldahl Nitrogen		0.10	1.95	1.80	2.28	1.78	2.18
L)			0.16	0.29	0.67	0.16	0.35
al Suspended Solids		2	20.00	10.00	6.00	11.00	25.00
Zinc	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Field Data:							
emperature (°C)			0.50	3.50	7.80	20.90	1.00
H (field) (pH unit	6.5-8.5		7.61	7.57	7.82	7.72	---[2]
uctivity (field) (µS/cm)			1173.00	827.00	1039.00	863.00	---[2]
issolved Oxygen			10.53	7.43	16.68	3.00	8.08

Measured / Estimated Flow (L/sec)				SWT1 - All Data, Limited Samples						
	LAB ID:									
	Station									
	Date Sampled:									
PARAMETER	PWQO	MRL		Mean	andard Deviatic	Positive SD	negative SD	Median	90th %	N
%)				98.67	3.79	102.45	94.88	97.00	101.80	3.00
g/L)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
(%)				103.67	9.71	113.38	93.95	106.00	110.80	3.00
Silver	0.0001	0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Al (dissolved)	0.075*	0.01		0.05	0.07	0.12	-0.02	0.03	0.07	32.00
kalinity as CaCO3		5		286.18	65.93	352.11	220.25	288.00	360.20	39.00
Arsenic	0.1	0.001		0.00	0.00	0.00	0.00	0.00	0.00	19.00
Boron	0.2*	0.01		0.11	0.04	0.15	0.08	0.12	0.15	40.00
Barium		0.01		0.05	0.01	0.06	0.04	0.05	0.07	40.00
				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Calcium		1		119.79	31.29	151.09	88.50	122.00	153.40	39.00
mical Oxygen Demand		1		4.03	6.84	10.87	-2.81	3.00	6.20	35.00
Cadmium	0.0002	0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Chloride		1		85.78	46.59	132.37	39.18	78.00	159.50	40.00
Cobalt	0.0009	0.0002		0.0005	0.0003	0.0008	0.0002	0.0004	0.0007	31.0000
ical Oxygen Demand		5		55.85	21.47	77.32	34.38	54.50	80.30	40.00
nductivity (µS/cm)		5		1046.00	276.60	1322.60	769.40	1035.00	1336.00	40.00
Chromium (total	0.0089**	0.001		0.00	0.00	0.01	0.00	0.00	0.01	31.00
Copper	0.005	0.001		0.0032	0.0012	0.0044	0.0019	0.0030	0.0050	39.0000
-)				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
olved Organic Carbon		0.50		18.50	4.04	22.54	14.46	19.60	22.90	11.00
Iron	0.3	0.03		0.74	1.14	1.88	-0.40	0.41	1.40	40.00
				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
rdness as CaCO3		1		418.28	114.08	532.36	304.20	418.00	540.00	39.00
Mercury	0.0002	0.0001		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Potassium		1		9.56	8.86	18.43	0.70	8.00	12.60	39.00
Magnesium		1		28.97	9.44	38.42	19.53	29.00	40.00	39.00
Manganese		0.01		0.07	0.09	0.16	-0.01	0.03	0.13	11.00
Sodium		2		65.36	30.89	96.25	34.47	58.00	111.40	39.00
-NH3 (Ammonia)		0.02		0.81	2.36	3.16	-1.55	0.20	1.07	38.00
un-ionized Amm	0.02			0.0092	0.0207	0.0299	-0.0115	0.0021	0.0154	35.0000
N-NO2 (Nitrite)		0.10		0.17	0.05	0.22	0.12	0.14	0.21	3.00
N-NO3 (Nitrate)		0.10		2.61	2.13	4.74	0.48	2.24	5.65	39.00
otal Phosphoru	0.03*	0.01		0.765	1.445	2.211	-0.680	0.365	1.393	40.000
Lead	0.025	0.001		0.00	0.00	0.00	0.00	0.00	0.00	4.00
pH (pH units)	6.5-8.5			8.00	0.26	8.26	7.73	8.00	8.28	40.00
Phenols	0.001	0.001		0.004	0.003	0.007	0.001	0.004	0.007	10.000
Selenium	0.1	0.001		0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	1.00
Sulphate		1		131.33	81.98	213.30	49.35	124.00	186.00	40.00
S (COND - CALC)		5		682.40	187.63	870.03	494.77	673.00	868.00	40.00
				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
				101.33	5.51	106.84	95.83	104.00	104.80	3.00
al Kjeldahl Nitrogen		0.10		2.60	3.13	5.73	-0.54	1.89	2.98	40.00
L)				1.45	3.52	4.97	-2.07	0.27	1.48	11.00
al Suspended Solids		2		37.20	59.88	97.08	-22.67	19.00	60.50	40.00
				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	0.00
Zinc	0.03	0.01		0.01	0.00	0.02	0.01	0.01	0.02	5.00
Field Data:										
emperature (ºC)				10.61	8.33	18.93	2.28	9.10	20.65	42.00
H (field) (pH unit	6.5-8.5			7.65	0.46	8.11	7.19	7.62	8.14	39.00
uctivity (field) (µS/cm)				991.48	312.93	1304.40	678.55	1020.00	1246.00	40.00
Dissolved Oxygen				8.31	4.48	12.79	3.84	8.09	13.32	39.00