



Nyrstar Myra Falls Mine

Annual Water Quality Report 2018

Submitted as required under Effluent Permit PE-06858 for the BC MoE

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Prepared by Nicole Pesonen

Reviewed by Christine Peters, MEng, Peng & Yaming Chen, PhD, PGeo



EXECUTIVE SUMMARY

Myra Falls is a 550,000 tonne per year base metal mine located at the south end of Buttle Lake on Vancouver Island, 90 km southwest of the city of Campbell River. The mining and milling operation produces zinc, copper and lead concentrates with silver and gold credits. Myra Falls is a wholly owned subsidiary of Nyrstar, a European-based company with corporate offices in Zurich, Switzerland.

This annual report details the environmental monitoring activities at Myra Falls for 2018 carried out under Effluent Permit PE-06858 and is in accordance with the annual reporting requirements of the Ministry of Environment.

Monthly sampling produced variable results with zinc and copper concentrations periodically higher at the furthest downstream sampling site within Myra Valley when compared to those sites upstream and closer to mining impacts. Initial assessments have identified the potential for contaminated ground water plumes to affect surface water quality in the receiving environment (Robertson GeoConsultants, 2018).

In 2018 projects that could impact water management at Myra Falls, including the completion of the planned 2017 lift of the Lynx TDF, the installation of an emergency spillway on the Lynx TDF, and the installation of the Lynx Shallow Seepage Interception System.

The Lynx TDF lift to elevation 362.5 MASL was completed, increased flood storage capacity to accommodate the new larger environmental design flood (EDF) volume, and an emergency spillway for flood events larger than the EDF.

Myra Falls completed installation and preliminary testing of the Lynx Shallow Seepage Interception System (Lynx SIS) in June of 2018, comprised of a fence of 5 pump back wells designed to capture contaminated ground water. It is anticipated that downstream of the mine operation will show improvements in Myra Creek water quality. Areas adjacent to the well fence are expected to show near-term improvements, with improvements in downstream water quality in the longer-term. Preliminary analysis is currently ongoing. (Robertson GeoConsultants, 2018)



TABLE OF CONTENTS

NYRSTAR MYRA FALLS MINE.....	1
ANNUAL WATER QUALITY REPORT 2018	1
EXECUTIVE SUMMARY	2
INTRODUCTION.....	6
SCOPE OF REPORT.....	6
NYRSTAR MYRA FALLS OVERVIEW	6
REGIONAL ENVIRONMENTAL/ECOLOGICAL CONDITIONS	7
LOCATION AND TOPOGRAPHY	7
MYRA CREEK DRAINAGE SYSTEM	8
CLIMATE	10
2018 WEATHER	11
TAILINGS DISPOSAL FACILITIES.....	13
LIME ADDITION WATER TREATMENT SYSTEM	13
WATER QUALITY MONITORING.....	15
SAMPLING METHODOLOGY	21
SURFACE GRAB SAMPLES	21
DEPTH PROFILE SAMPLES (BUTTLE LAKE).....	21
WATER TREATMENT MONITORING AND PERFORMANCE.....	21
EFFLUENT AND RECEIVING ENVIRONMENT RESULTS BY PARAMETER OF CONCERN	23
ZINC 26	
MONTHLY / QUARTERLY ZINC	26
COPPER.....	31
MONTHLY / QUARTERLY COPPER.....	31
DAILY COMPOSITE MONITORING	34
DAILY/WEEKLY COMPOSITE COPPER	35
DISSOLVED ALUMINUM	39
DISSOLVED CADMIUM	40
OTHER PARAMETERS.....	42
TOTAL SUSPENDED SOLIDS & FLOW MONITORING	43
MYRA CREEK FLOW MONITORING	44
SEWAGE TREATMENT PLANTS.....	45
BUTTLE LAKE	46
TOTAL ZINC	47
TOTAL COPPER	49
DISSOLVED CADMIUM	51
GROUNDWATER AND SEEP MONITORING	53
QUALITY ASSURANCE / QUALITY CONTROL.....	67
FIELD AND TRIP BLANKS	67
FIELD DUPLICATES	68
EVENTS OUTSIDE OF NORMAL OPERATIONAL PARAMETERS.....	71
CLOSURE.....	72



FIGURES

FIGURE 1: REGIONAL LOCATION OF MYRA FALLS MINE.....	7
FIGURE 2: SITE PLAN	9
FIGURE 3: ANNUAL PRECIPITATION 2018.....	10
FIGURE 4: MONTHLY RAINFALL FOR 10 YEARS WITH 40-YEAR AVERAGE	12
FIGURE 5: 2018 CUMULATIVE PRECIPITATION	13
FIGURE 6: TREATMENT PONDS CONFIGURATION	14
FIGURE 7: DAILY ZINC CONCENTRATIONS WITH PRECIPITATION.....	29
FIGURE 8: 10-YEAR ZINC CONCENTRATIONS IN RECEIVING ENVIRONMENT	30
FIGURE 9: 10 YEAR TOTAL COPPER CONCENTRATIONS IN THE RECEIVING ENVIRONMENT - 2018.....	34
FIGURE 10: DAILY COPPER CONCENTRATIONS 2018.....	36
FIGURE 11: TOTAL LEAD WEEKLY RESULTS	37
FIGURE 12: 10 YEAR CADMIUM CONCENTRATIONS	42
FIGURE 13: MYRA CREEK AND EFFLUENT FLOWS WITH PRECIPITATION.....	44
FIGURE 14: TOTAL ZINC AT HENSHAW 2018.....	48
FIGURE 15: KARST LOCATION - BUTTLE LAKE 2007 – 2017.....	49
FIGURE 16: TOTAL COPPER CONCENTRATIONS AT HENSHAW CREEK IN BUTTLE LAKE 2009-2018.....	50
FIGURE 17: TOTAL COPPER CONCENTRATIONS AT KARST CREEK IN BUTTLE LAKE 2009-2018.	51
FIGURE 18: TOTAL CADMIUM CONCENTRATIONS IN BUTTLE LAKE AT HENSHAW 2009-2018.	52
FIGURE 19: TOTAL CADMIUM CONCENTRATIONS IN BUTTLE LAKE AT KARST 2009-2018.....	53
FIGURE 20: OLD TDF OUTER DRAIN WELLS A	59
FIGURE 21: OLD TDF OUTER DRAIN WELLS B	60
FIGURE 22: SUPERPOND AREA WELLS A.....	62
FIGURE 23: SUPERPOND AREA WELLS B.....	63
FIGURE 24: DOWNSTREAM WELLS A.....	65
FIGURE 25: DOWNSTREAM WELLS B.....	66



TABLES

TABLE 1: MONITORING LOCATIONS JANUARY 1 – JULY 5, 2018.....	16
TABLE 2: MONITORING REQUIREMENTS JULY 5 - DECEMBER 2018.....	17
TABLE 3: PE-06858 - SECTION 3 SAMPLING REQUIREMENTS JANUARY 1 – JULY 5, 2018	19
TABLE 4: MONITORING REQUIREMENTS FROM JULY 5, 2018 PERMIT AMENDMENT	20
TABLE 5: SUPERPOND WATER TREATMENT SYSTEM MAJOR SOURCE VOLUMES BY MONTH.....	22
TABLE 6: EFFLUENT FLOW VOLUMES BY MONTH.....	23
TABLE 7: PERMITTED EFFLUENT CONCENTRATIONS	24
TABLE 8: INFLUENT SAMPLE CHEMISTRY - KEY VARIABLES.....	26
TABLE 9: TOTAL ZINC MONTHLY GRAB SAMPLES, 2018	26
TABLE 10: DISSOLVED ZINC MONTHLY GRAB SAMPLES 2018.....	27
TABLE 11: AVERAGE MONTHLY TOTAL ZINC CONCENTRATIONS 2008 - 2018.....	28
TABLE 12: MONTHLY / QUARTERLY GRAB SAMPLE TOTAL COPPER CONCENTRATIONS, 2018.....	32
TABLE 13: AVERAGE MONTHLY COPPER CONCENTRATIONS 2008 - 2018	33
TABLE 14: MONTHLY / QUARTERLY GRAB SAMPLE DISSOLVED COPPER CONCENTRATIONS, 2018.....	33
TABLE 15: MONTHLY / QUARTERLY GRAB SAMPLE TOTAL LEAD CONCENTRATIONS, 2018.....	38
TABLE 16: MONTHLY / QUARTERLY GRAB SAMPLE DISSOLVED LEAD CONCENTRATIONS, 2018.....	39
TABLE 17: DISSOLVED ALUMINUM CONCENTRATIONS IN MONTHLY GRAB SAMPLES 2018.....	40
TABLE 18: SUMMARY OF DISSOLVED CADMIUM IN GRAB SAMPLES 2018	41
TABLE 19: QUARTERLY EFFLUENT GRAB SAMPLE RESULTS 2018	42
TABLE 20: HIGH FLOW TSS SAMPLING	43
TABLE 21: GRAB SAMPLE RESULTS FOR SEWAGE TREATMENT PLANTS.....	45
TABLE 22: TOTAL ZINC CONCENTRATIONS IN DEPTH PROFILES	47
TABLE 23: TOTAL COPPER CONCENTRATIONS IN DEPTH PROFILES	49
TABLE 24: DISSOLVED CADMIUM CONCENTRATIONS IN DEPTH PROFILE.....	52
TABLE 25: GROUNDWATER SEEP SYSTEMS	55
TABLE 26: WAREHOUSE SEEP RESULTS 2014 - 2018	56
TABLE 27: PUMPHOUSE 4 SEEP B (LOWER)	56
TABLE 28: PUMPHOUSE 4 SEEP A (UPPER)	57
TABLE 29: CAR BRIDGE / 25 SUMP SEEPS	58
TABLE 30: SUMMARY OF EVENTS OUTSIDE NORMAL OPERATIONAL PARAMETERS IN 2018.....	71

Appendices

Appendix A: Creek Stage and Flow Data
Appendix B: Weather Data
Appendix C: Laboratory Reports
Appendix D: Daily Data – pH, Flow, Composites Tabulated Water Quality Data
Appendix E: Buttle Lake Water Quality
Appendix F: Groundwater Results
Appendix G: QA/QC Sampling
Appendix H: Sampling Station Maps



Introduction

Scope of Report

The following report details the environmental monitoring activities pertaining to the effluent permit PE-06858 issued under the Environmental Protection Act and administered by the British Columbia Ministry of Environment (BC MoE) at the Myra Falls Mine for calendar year 2018. The report includes a review and interpretive report as required under PE-06858 Section 4.3, a summary of unusual events occurring on site in 2018, a discussion on the changes in the environment resulting from mining activity; and a projection of significant activities planned for 2019.

Glenn Smith
General Manager

250-287-9271 (3279)
Glenn.Smith@nyrstar.com

Jacques Leclerc
Health, Safety, Environment and Communities
Manager

250-287-9271 (3272)
Jacques.Leclerc@Nyrstar.com

Nyrstar Myra Falls Overview

Nyrstar is an integrated mining and metals business based in Europe with corporate offices in Zurich, Switzerland, with market leading positions in zinc and lead, and growing positions in other base and precious metals. The company has mining, smelting, and other operations located in Europe, the Americas, China and Australia. Nyrstar is listed on NYSE Euronext Brussels under the symbol NYR. Nyrstar Myra Falls (NMF) is a wholly-owned subsidiary of Nyrstar.

Myra Falls is a 550,000 tonne per year base metal mine located at the south end of Buttle Lake on Vancouver Island within the Strathcona Provincial Park Class 'B' boundary (Figure 1), 90 km southwest of the city of Campbell River. The mining and milling operation produces zinc, copper and lead concentrates with silver and gold credits. Ore concentrate is trucked to a port terminal in Campbell River where it is shipped to refining smelters around the world. The mine has been operating since 1966; In June of 2015 the mine suspended its mining and milling operations. The Nyrstar Board of Directors conditionally approved the restart plan on May 04, 2017 and additional permit applications in support of the restart plan include updates to the Mines Act Permit M-26, updates to the Air Permit PA-02408, updates to PE-06858 and a letter of authorization from BC Parks to expand and replace surface infrastructure impacted by the restart projects.



The 3,328 ha area of Strathcona-Westmin 'Class B' Provincial Park is held as crown grants, mining leases and claims, issued under the Mines Act by the Ministry of Energy, Mines, and Petroleum Resources (MEMPR).

The mine property is comprised of 5 Crown-granted mining leases, 23 Crown-granted mineral rights and 44 mining claims, all wholly owned by Nyrstar Myra Falls Ltd.

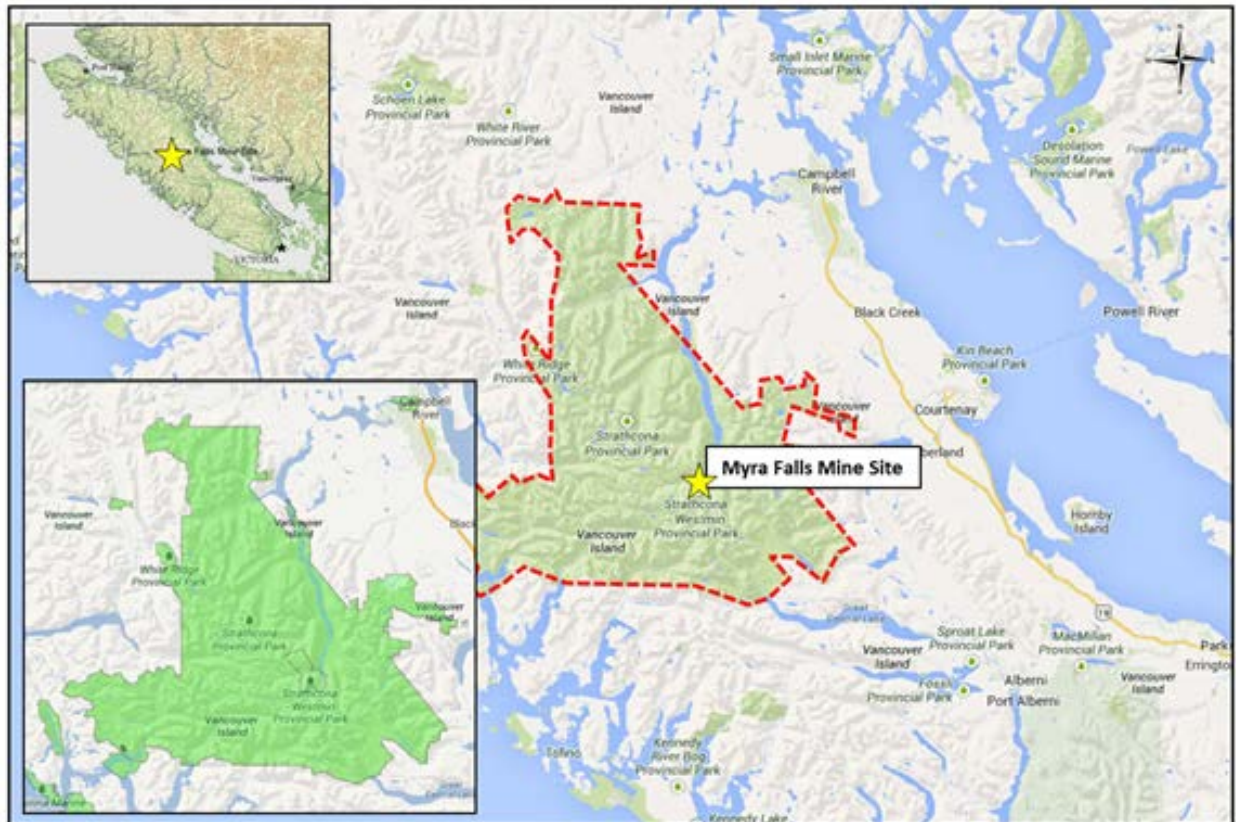


Figure 1: Regional Location of Myra Falls Mine

Regional Environmental/Ecological Conditions

Location and Topography

The footprint of the Nyrstar Myra Falls mine site straddles the Myra Valley and the lower reaches of Myra Creek (Figure 2). Myra Creek flows from west to east through a steep-sided hanging valley and discharges over Myra Falls into Buttle Lake.

The slopes of Myra Valley climb steeply with an average gradient of 1.5H:1V. To the south, the slope rises to 1814 meters above sea level (MASL) at the summit of Mount Myra from the average valley bottom elevation of 307 MASL. Topography in the area



exerts a strong influence on air mass movement and wind directions. Winds blow predominantly along the axis of the Myra Valley. At night, air masses are drawn down the mountains, continue along the valley floor and out over Buttle Lake. During the day, winds up cast along the mountainsides with air masses typically moving up the valley. Wind velocities at Nyrstar Myra Falls are generally low, typical of sites in protected valleys.

Myra Creek Drainage System

Myra Creek has a total length of 16 km and drains an area of 72 km² into Buttle Lake. Myra Creek and its tributaries are characterized by steep, cascading mountain streams bounded by rock. The creek descends in elevation from 1,814 m to 221 m at Buttle Lake. Its three major tributaries are Tennent Creek, Arnica Creek and Webster Creek.

Myra Falls has three major clean water diversion ditches diverting water from upslope areas to Arnica Creek, Cascade Creek and Myra Creek from the north side of the site. The Arnica Diversion Ditch (ADD) captures three small streams, two of which are ephemeral. This ditch is directed to Arnica Creek and diverts non-contact water around the Lynx Mine, the Upper Lynx Open Pit, WRD2, WRD3, and WRD4. It is upslope of the Upper Lynx Diversion Ditch. The Upper Lynx Diversion Ditch (ULDD) captures three small streams, one of which is ephemeral. It diverts water from the Upper Lynx Open Pit, Lynx Mine, WRD2, WRD3, and the Lynx Tailings Disposal Facility (Lynx TDF). This ditch flows into the Cascade Creek. Lower Lynx Diversion Ditch (LLDD) routes Cascade Creek and several small ephemeral springs around the Myra Tailings Disposal Facility (Old TDF) and conveys this flow to Myra Creek. The LLDD was upgraded in 2015 and 2016 to convey the updated Inflow Design Flood (IDF) for the Old TDF. Construction on the Diversion Ditch Spring Drain (DDSD) was completed in conjunction with the LLDD upgrade; this underdrain system conveys water that flows below the LLDD into operational area in a controlled manner, thereby reducing sediment loading and erosion of the tailings facility during periods of high flows.

Myra Creek flow is monitored at the "Car Bridge" with a pressure transducer and data logger system. The system logs creek-stage measurements at 15 minute intervals. Stage measurements are converted to flow using a stage-discharge curve calculation. Calculated Myra Creek flows for 2018 are included in Appendix A. The stage-discharge curve for Myra Creek may require an update as several larger events have occurred that have changed the cross section of the creek since the curve was developed. This work will include a calibration of the installed equipment and a verification of the flow curve under several flow regimes completed over several seasons to ensure all normal flow regimes are encountered. Should the flow curve change, this information will be included in future reports to the interested regulators and consultants.

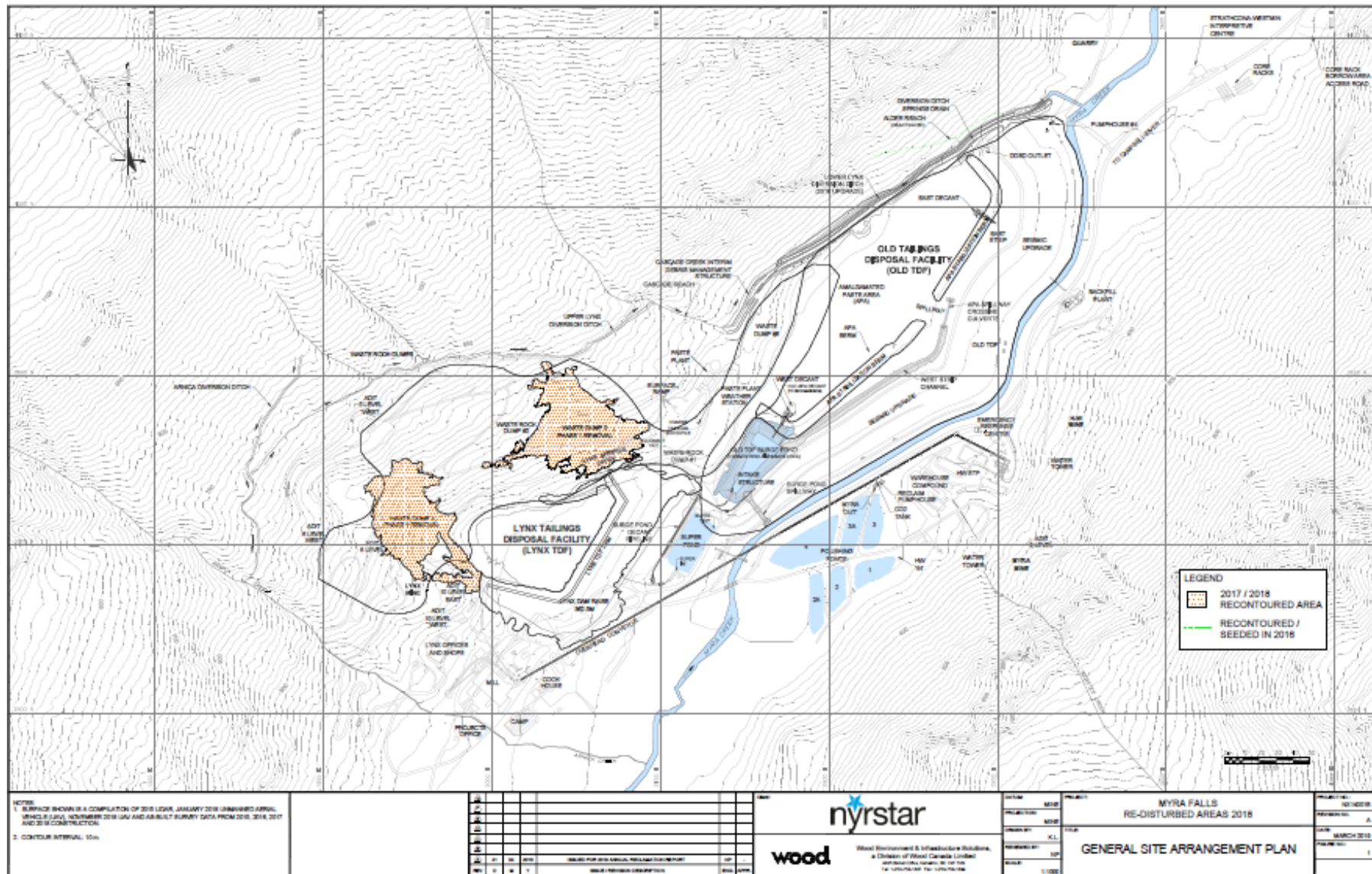


Figure 2: Site Plan

Climate

The climate in the Myra Valley and surrounding areas is classified as Marine West Coast as per the Köppen Climate Classification System. Weather patterns are typical of other coastal regions of British Columbia. Frequent fronts from the Pacific Ocean and Gulf of Alaska combine with orographic influences to produce abundant precipitation. Prevailing westerly winds and the moderating influence of the Pacific Ocean result in generally mild winters and warm summers, producing a relatively narrow annual temperature range. Freezing conditions can be expected to occur anytime from October through May. Records indicate that the site should average 160 frost-free days per year.

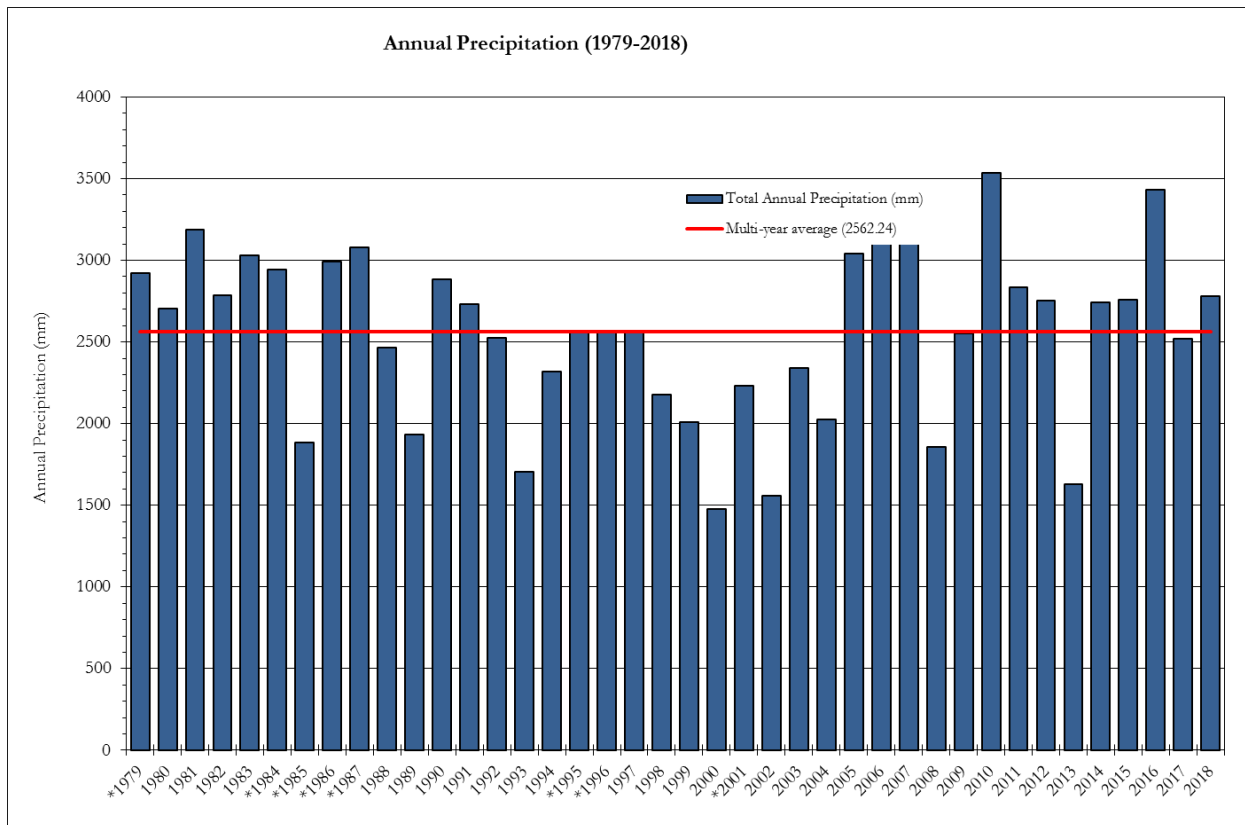


Figure 3: Annual Precipitation 2018¹

Myra Falls has been operating an Environment Canada weather station since 1979. The weather station was located outside the Old Powerhouse at approximately 360 MASL. This previous station was removed when the Old Powerhouse was demolished. The automated weather station/data logger that was installed in 2012 is used as the primary station for weather measurements, including precipitation data and storm event logging, as the monitoring equipment records data with greater frequency and precision. The

¹ *YYYY – This notation indicates that some of the data was lost for the site weather station during that year and the data has been patched by using the average precipitation for that month from the existing record.



automated weather station is located adjacent to the Paste Plant at approximately 371 MASL. Figure 3 shows annual precipitation data for Myra Falls as recorded by the Environment Canada weather station 1979-2011 and Myra Falls automated weather station 2012-2018.

Total precipitation as measured in 2018 was 2782.3 mm, 220.1mm above the 40 year average of 2562.24 mm with 26% of the total rainfall occurring in the month of December, 22% in January, and 15% in November.

2018 Weather

Relative to previous years' weather, Myra Falls received normal overall precipitation for the annual and quarterly statistics; however individual months were highly variable, with recorded rainfall in either the highest or lowest quartile for each of the monthly data sets for every month except November. December 2018 was the wettest December measured from the start of monitoring in 1979.

The first quarter of 2018 received within average rainfall amounts, however January was higher than average, in the upper quartile of the 40 year data range for the month, while both February and March were below average in the lowest quartile of data for the same data set.

Quarter two measured average rainfall, with April and June both higher than average in the highest quartile; May was very dry, with only 2.1 mm more rainfall measured than the lowest rainfall recorded in the 40 year record.

The third quarter was higher than average, however this was driven by a wet September, which was in the fourth quartile of the data set for the month; July and August were very dry and were in the lowest quartile of their respective data sets.

As is the typical seasonal norm, the fourth quarter recorded significantly higher precipitation than the rest of 2018 and accounted for 45.9% of the annual rainfall. December alone accounted for 26% of the annual precipitation and received almost double the average precipitation. October was well below average and fell within the lowest quartile, and November was just below average monthly precipitation for the full record. Figure 4 depicts the monthly weather as compared to the 40 year average and the previous 10 years of recorded precipitation.

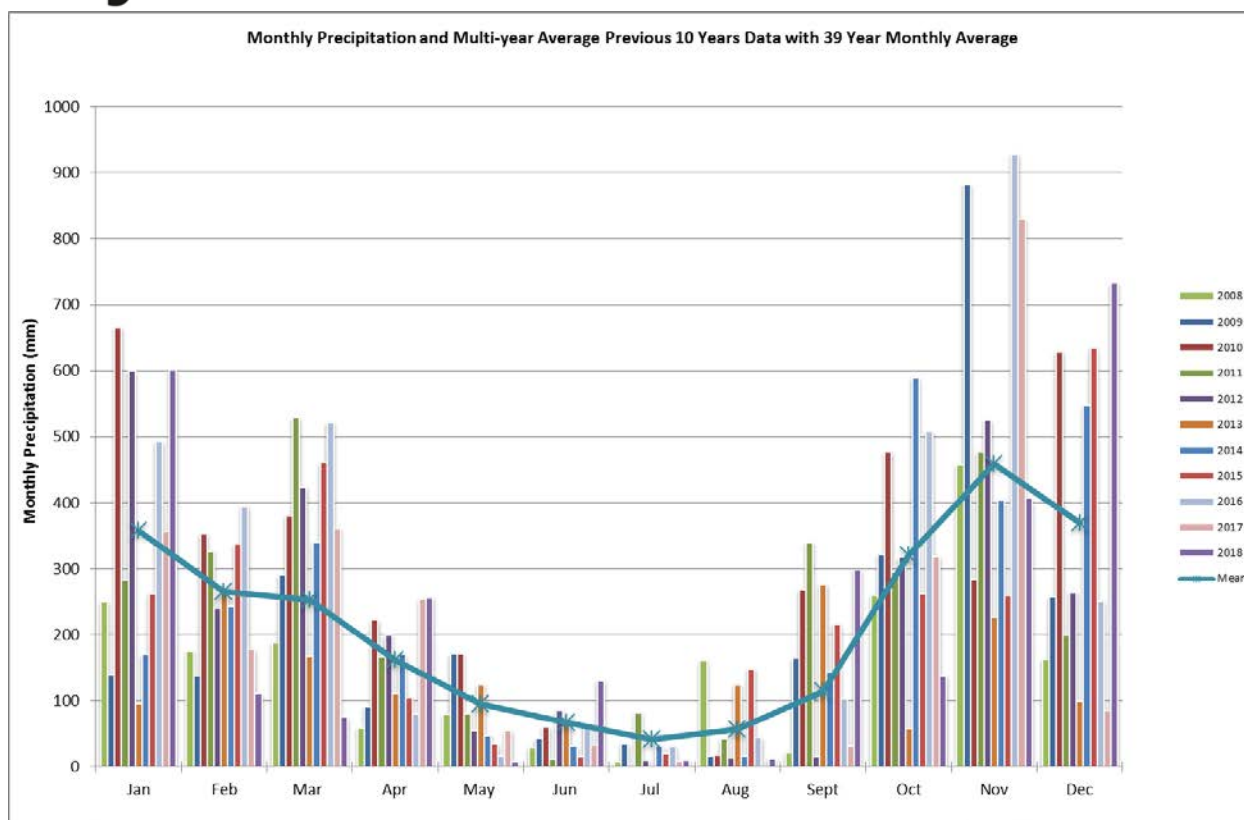


Figure 4: Monthly Rainfall for 10 Years with 40-year average

The highest single day of precipitation occurred on January 17th, with 89.8 mm measured over 24 hours accounting for 15% of the month's total precipitation. It is noted that the daily rainfall does not accurately reflect the peak storm events, as it is measured from midnight to midnight; the highest intensity 24-hour rainfall recorded in 2018 occurred overnight December 13th - 14th, and peaked at 120.9 mm / 24-hour, which is less than the 2 year annual exceedance probability event threshold of 128 mm (Amec Foster Wheeler, July 2012). This is the first year in several that Myra Falls did not have an event over the normal typical annual storm event; however there were seven (7) hourly rainfall events with more than 10 mm/hr, which is considered very high for the area. These events have been linked to high flows through the water treatment system that were unusual for storms of the size recorded at the time.

Figure 5 depicts the cumulative precipitation by day in 2018. Tabulated data from 1979 to date and the detailed daily weather summary for 2018 are included in Appendix B.

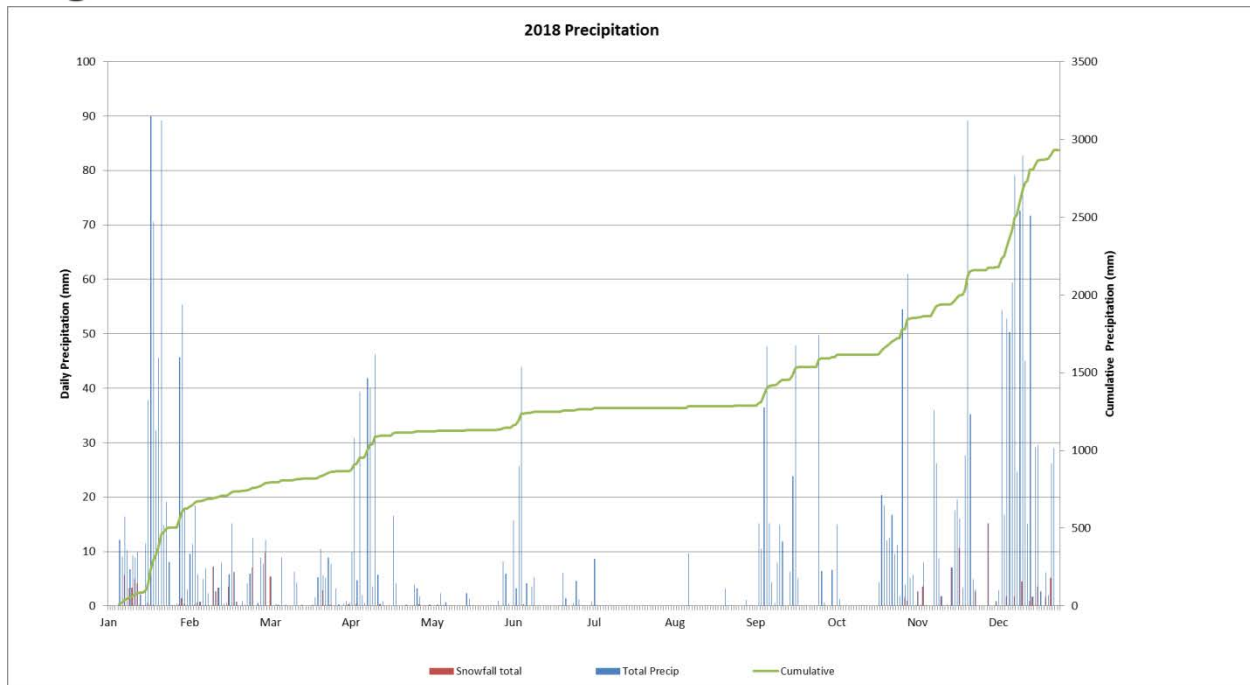


Figure 5: 2018 Cumulative Precipitation

Tailings Disposal Facilities

From 1967 - 1984 tailings were deposited sub-aqueously into the south end of Buttle Lake. Since 1984 the mine has utilized a surface tailings disposal facility (TDF) for its tailings impoundment, starting with the Myra Tailings Disposal Facility (now referred to as the Old TDF), which was filled to completion in 2011. In 2008, a newly constructed Lynx TDF became the main depositional facility for tailings, replacing the Old TDF which is now at full capacity. At final design elevation, the Lynx TDF has storage capacity for approximately 8 years of production at planned mining rates with a final proposed design height of approximately 57 m. The TDF has been designed to store the 1:200 Annual Exceedance Probability (AEP) event 24-hour Environmental Design Flood (EDF) of 303,000 m³, with flood waters in excess of that volume directed out of the facility through the Emergency Spillway to Myra Creek. At final elevation the facility will provide storage for approximately 1.5 Mt of pasted tailings, or approximately 8 years of surface deposition requirements.

Lime Addition Water Treatment System

The water treatment system at Myra Falls collects and treats contaminated groundwater, surface runoff, mill effluent, tailings decant water, mine water and sewage treatment plant effluent. Contaminated water is directed to the primary reaction pond, (Superpond) where the pH is increased to a target pH of 10.2, (effective range between 10 and 10.5 pH) through the addition of lime slurry (Ca(OH)₂). The elevated pH causes metals to become insoluble and precipitate out of solution primarily as metal hydroxide



sludge. The Superpond discharges into the Myra Polishing Ponds System, consisting of a series of 6 settling ponds that allow any remaining suspended solids to settle out of solution (Figure 6).

With the exception of Myra 3, which only decants to Myra Out, there are two potential discharge points for each settling pond. By adding or removing check boards, decant outflows can be increased, decreased, or ponds isolated completely in response to changing operational or environmental circumstances. A CO₂ sparger located immediately downstream of pond confluence adjusts the treated effluent's pH back down within permitted limits, and is monitored continuously to maintain a target pH of 8.5 (effective operating range between 8.3 and 8.7 pH). The treated water is then discharged to Myra Creek via a 30" Parshall flume equipped with an ultrasonic device that continuously monitors flow rates.

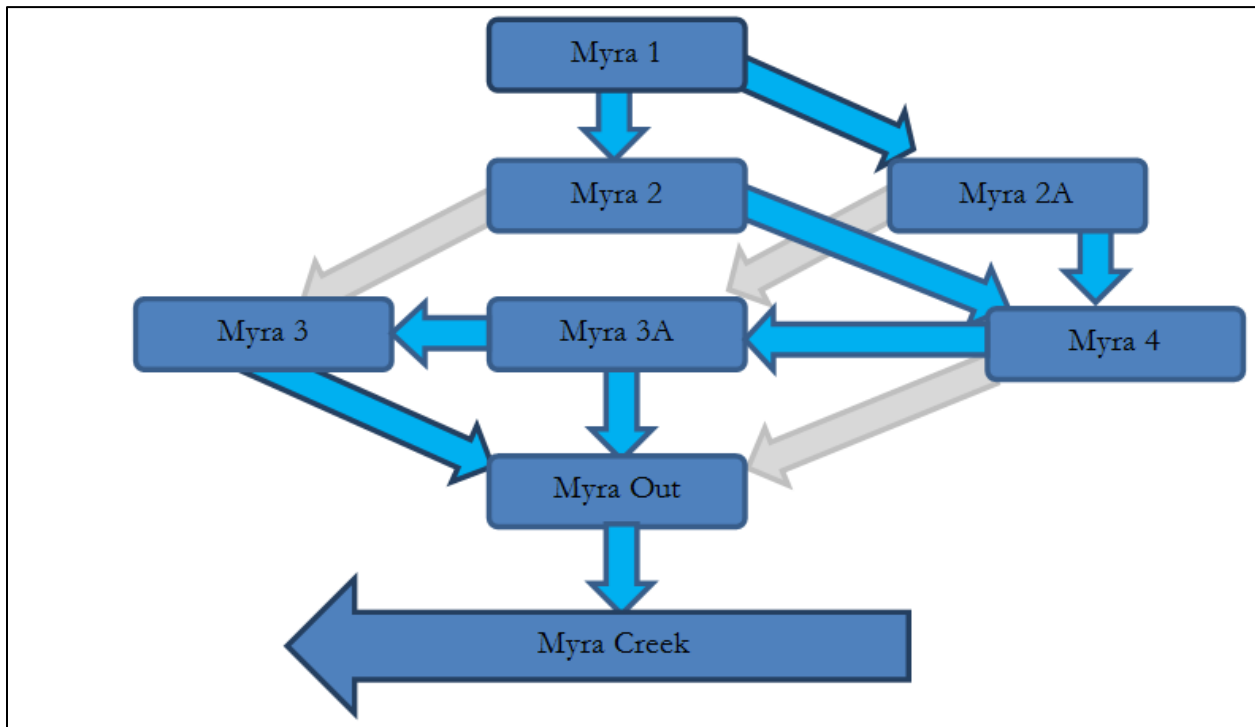


Figure 6: Treatment Ponds Configuration

Treatment ponds must be regularly cleaned out or dredged of solids to maintain capacity and operational effectiveness. The Superpond is equipped with an automated traversing barge and pump system which pumps sediment laden water to the active Tailings Disposal Facility (Lynx TDF) thereby slowing the rate of sludge build up in the Superpond and operating to maintain treatment capacity and residence time.



The pipe that passively transports water from the Superpond to the Myra One Pond was replaced in two sections in the summers of 2017 and 2018, as it contained large amounts of scale buildup and was not allowing for sufficient passive flow through the pipe. Effluent from Superpond often had to be actively pumped into Pond 1 during precipitation events to augment the passive decant flows. The pipe has now been completely replaced and passive flow has been increased, reducing the reliance on mechanised water movement from the pond.

During the 2018 pipe replacement, Myra Ponds 1 and 2 had to be kept at a low level for geotechnical stability, so inflows were actively pumped to Myra Pond 2A through the emergency over flow pipe which was relocated from Myra 1 Pond for this purpose. This change in flow routing resulted in Myra 2A Pond becoming the first of the secondary settling ponds in place of Myra 1 Pond, which resulted in higher than normal levels of sludge deposition in this pond. The emergency overflow pipe for Superpond is still routed to Pond 2A, resulting in less settling time for flows from this pipe in the Myra Pond System; the majority of the flows are directed via the normal decant to Myra 1 Pond and have the full settling capacity of the system as it was originally set up. While water was routed around Myra Ponds 1 and 2, the sludge that had accumulated in the ponds since the last dredge campaign in 2015 was removed via a long-reach backhoe and haul truck. Sludge that accumulated in Myra 2 A during the change is being removed via a floating dredge pump installed in the pond in late 2018.

A third stage of this project will be completed in 2019 to fully restore the full passive flow for this system. Works to be completed include the relocation of the Emergency Decant Pipe back to Myra 1 Pond to ensure the maximum settling time for flows from this pipe and the removal of sludge and lime scale build-up behind the concrete weir in the Superpond that limits flow entering the decant pipe. While these final works are not yet completed, pumping is still required during high precipitation events to augment passive flows from the Superpond. This work is scheduled for the summer of 2019.

Water Quality Monitoring

The water quality monitoring program at Myra Falls is outlined in the Effluent Permit PE-06858 Section 3; monitoring locations are described in Tables 1, and 2; sampling frequencies are detailed in Tables 3 and 4. Results of this monitoring program are discussed in the following sections.

A permit amendment was received July 5th, 2018 that changed some of the monitoring requirements. This has resulted in additional sampling locations and changes to some



of the methodologies used, mid-way through the year. These changes are discussed in the following section on sampling methodology, and depicted in the tables below.

Table 1: Monitoring Locations January 1 – July 5, 2018

Site Name / SNR	Monitoring Purpose
Tailings Impoundment Supernatant SRN: E207740	Monitored for quality to determine compliance with effluent limits as per PE-06858. This water is currently routed to treatment and is not decanted directly from site as it did not comply with permitted effluent chemistry without treatment.
Myra Ponds MP-EFF SRN: E100666	Monitored for quality to ensure treatment system is operating within expected parameters and to determine compliance with effluent limits as per PE-06858. This water is monitored at the decant location to Myra Creek.
Price Pond #2 (east side) PRICE SRN: E100662	Monitored for quality to determine compliance with effluent limits as per PE-06858. This facility is an exfiltration basin, discharging to ground and does not allow surface flow out of the facility as designed.
Myra Creek, MC-M1 SRN: 0124784	This location serves as the upstream reference site to determine the relative impacts on Myra Creek by the Myra Falls Operations. The hardness as measured at M-1 Monitoring Location is used to determine the hardness based WQG for all Myra Creek Monitoring Sites.
Myra Creek, MC-M2 SRN: 0124785	This location is the furthest downstream monitoring location in Myra Creek and is downstream of all mine-related inputs. This site is also downstream of the clean-fill quarries used by the mine as reclamation cover materials.
Myra Creek below Pumphouse #4 MC-TP4 SRN: E206805	Located immediately downstream of Pumphouse 4, downstream of the seepage collection system, upstream of the Lower Lynx Diversion Ditch. This site monitors the immediate impacts of the mine to Myra Creek.



Table 2: Monitoring Requirements July 5 - December 2018

Site Name / SNR	Monitoring Purpose
Tailings Impoundment Decant Effluent TDF-EFF SRN: E207740	Monitored for quality to determine compliance with effluent limits as per PE-06858. This water is currently routed to treatment as the decant structure to allow flows to creek has not yet been constructed.
Outlet at Superpond Inlet Ditch (eastern mine footprint) TDF Dissipater Outlet E311488	Monitored for quality to determine the concentrations of influent to the treatment system. Aids in assessing the effectiveness of treatment, characterizing the incoming contaminants from the Eastern portion of the surface footprint of the mine, as well as the Lynx Spring Drain and the Myra Tailings Dam (Old TDF) Underdrain system.
Outlet at Superpond Inlet Ditch (western mine footprint) Mill Run – Off Collection Ditch E311028	Monitored for quality to determine the concentrations of influent to the treatment system. Aids in assessing the effectiveness of treatment, characterizing the incoming contaminants from the Western portion of the surface footprint of the mine, as well as the Mill Effluent and the Outflow from the sewage treatment systems.
Mine contact water effluent outfall MP-EFF E100666	Monitored for quality to ensure treatment system is operating within expected parameters and to determine compliance with effluent limits as per PE-06858. This water is monitored at the decant location to Myra Creek.
Price Pond, below Portal #13 PR-13L E100662	Monitored for quality to determine compliance with effluent limits as per PE-06858. This facility is an exfiltration basin, discharging to ground and does not allow surface flow out of the facility as designed.
Sewage effluent from HW treatment plant HW STP E311008	Monitored to ensure compliance with permit limits and effectiveness of treatment.
Sewage effluent from Myra treatment plant Myra STP E311009	Monitored to ensure compliance with permit limits and effectiveness of treatment
Myra Creek, 30 m upstream from Tennent Hydro Plant MC-M1 EMS-0124784	This location serves as the upstream reference site to determine the relative impacts on Myra Creek by the Myra Falls Operations. The hardness as measured at MC-M1 Monitoring Location is used to determine the hardness based WQG for all Myra Creek Monitoring Sites.
Myra Creek, 1.3 km downstream from Lower Lynx Diversion Ditch MC-M2 EMS-0124785	This location is the furthest downstream monitoring location in Myra Creek and is downstream of all mine-related inputs. This site is also downstream of the clean-fill quarries used by the mine as reclamation cover materials.



Site Name / SNR	Monitoring Purpose
Myra Creek, below Pumphouse #4 MC-TP4D/M EMS- E206805	Located immediately downstream of Pumphouse 4, downstream of the seepage collection system, upstream of the Lower Lynx Diversion Ditch. This site monitors the immediate impacts of the mine to Myra Creek.
Mid lake off Henshaw Creek depths @ 0 m, 10 m, 20 m, 40 m, 60 m and 100 m HENSHAW EMS-0130082	Buttle Lake approximately 2.8 km downstream of the base of Myra Falls This site monitors the water quality impacts of the mine to Buttle Lake both at surface and at depth.
Mid lake off Karst Creek depths @ 0 m, 10 m, 20 m, 40 m, 60 m and 100 m KARST EMS-0130090	Buttle Lake approximately 8.5 km downstream of the base of Myra Falls. This site monitors the water quality impacts of the mine to Buttle Lake both at surface and at depth.
Buttle Lake off Gold River Bridge depth @ surface BL-GOLD EMS-0130080	This is the sample site located furthest downstream from the mine and the location is also referred to as Buttle Narrows. It is sampled at the same time as the Myra Creek samples.



Table 3: PE-06858 - Section 3 Sampling Requirements January 1 – July 5, 2018

Site Parameter	Myra Creek, M-1	Myra Creek, M-2	Myra Creek below Pumphouse #4
pH	Q-G	M-G	D-C
temperature		M	
total zinc	Q-G	M-G	D-C
dissolved zinc	Q-G	M-G	M-G
total aluminium	Q-G	Q-G	Q-G
dissolved aluminium	Q-G	Q-G	Q-G
total cadmium		M-G	M-G
dissolved cadmium		M-G	M-G
total copper	Q-G	M-G	D-C
dissolved copper	Q-G	M-G	M-G
total iron	Q-G	Q-G	Q-G
dissolved iron	Q-G	Q-G	Q-G
total lead	Q-G	M-G	M-G
dissolved lead	Q-G	M-G	M-G
total phosphorus		M-G	
total diss. Phosphorus		M-G	
Nitrogen (as ammonia)		M-G	
Nitrate/nitrite		M-G	
sulphate		M-G	
Site Parameter	Tailings Impoundment Supernatant	Myra Ponds	Price Pond (east side)
Flow		D	
pH	Q-G	Co-R	M-G
total suspended solids	Q-G	M-G	
total zinc	Q-G	D-C	M-G
dissolved zinc	Q-G	M-G	
total copper	Q-G	D-C	M-G
dissolved copper	Q-G	W-G	
total cadmium	Q-G	Q-G	
dissolved cadmium	Q-G	Q-G	
total lead	Q-G	W-G	
dissolved lead	Q-G	M-G	
sulphate	Q-G	Q-G	
total nitrogen	Q-G	Q-G	
total phosphorus	Q-G	Q-G	
toxicity (96 hr LC ₅₀)		Q-G	



Table 4: Monitoring Requirements from July 5, 2018 Permit Amendment

Table 1: Monitoring Requirements from July 6, 2020 to Permit Amendment						
Sampling Point Description	Tailings Impoundment Decant Effluent	Outlet at Superpond Inlet Ditch (eastern mine footprint)	Outlet at Superpond Inlet Ditch (western mine footprint)	Mine contact water effluent outfall	Price Pond, below Portal #13	Sewage effluent from two treatment plants
Physical Parameters and Frequency						
Flow	D when discharging	-		Co	-	
Analytical Parameters and Frequency						
pH	Co-R	Q-G	Q-G	Co-R	M-G	-
TSS	M-G	Q-G	Q-G	M-G	-	BA-G
Total Zinc	D-G	Q-G	Q-G	D-C	M-G	-
Dissolved Zinc	M-G	Q-G	Q-G	M-G	-	
Total Copper	D-G (LDL)	Q-G	Q-G	D-C (LDL)	M-G	-
Dissolved Copper	D-G (LDL)	Q-G	Q-G	D-C (LDL)	-	
Total Cadmium	Q-G				-	
Dissolved Cadmium	Q-G				-	
Total Lead	W-G	Q-G	Q-G	W-G	-	
Dissolved Lead	M-G	Q-G	Q-G	M-G	-	
Sulphate	Q-G				-	
Total Nitrogen	Q-G				-	
Total Phosphorus	Q-G				-	
Bioassay Parameters and Frequency						
Toxicity Test ³	Q-G	-		Q-G	-	
5 day Biochemical Oxygen Demand	-					BA-G
Sampling Point Description	Myra Creek, 30 m upstream from Hydro Plant		Myra Creek, 75 m downstream from Line Bridge crossing		Myra Creek, below Pumphouse #4	
Analytical Parameters and Frequency						
pH	Q-G		M-G		D-C	
Temperature	-		M		-	
Total Zinc	Q-G		M-G		D-C	
Dissolved Zinc	Q-G		M-G		M-G	
Total and Dissolved Aluminium	Q-G					
Total and Dissolved Cadmium	-		M-G		M-G	
Total and Dissolved Copper	Q-G		M-G		D-C (LDL)	
Total and Dissolved Iron	Q-G					
Total and Dissolved Lead	Q-G		M-G		M-G	
Total and Dissolved Phosphorus	-		M-G		-	
Nitrogen (as Ammonia)	-		M-G		-	
Nitrate/Nitrite	-		M-G		-	
Sulphate	-		M-G		-	

Surface Grab Samples

Grab samples are collected weekly, monthly and quarterly as required by PE-06858. The samples are sent off-site for analyses of total suspended solids (TSS), total and dissolved metals by ICP-MS, sulfate, nitrogen, phosphorus and acute toxicity (96-hr rainbow trout LC₅₀).

Depth Profile Samples (Buttle Lake)

Every second month, a depth profile for two separate sites on Buttle Lake is developed by collecting grab samples at various depth intervals with a Van Dorn or Kemmerer Sampler. The sampling depth for these locations was changed in the July 5, 2018 amendment. The Henshaw Location is approximately 2.8 km downstream of the base of Myra Falls and prior to the permit amendment was sampled at 0 (surface), 10, 20, 40 and 60 meter depths. The Karst Location is approximately 8.5 km downstream from the base of Myra Falls and prior to the permit amendment was sampled at depths of 0, 20, 40, 60, and 100 meters. Both sites are now sampled at depths 0, 10, 20, 40, 60, and 100 meters. This change resulted in two occurrences during the dry months when the Kemmerer sampler hitting the bottom of the lake at the Henshaw location due to insufficient depth to obtain the 100 m sample.

In addition to water chemistry, surface samples of phytoplankton and chlorophyll-a, and a 25 m vertical tow to sample zooplankton are also collected as part of the Buttle Lake sampling program. Field physical parameters (temperature, pH, specific conductivity, and dissolved oxygen) are taken at 5 m intervals from surface to depths of 50 meters using a hydrolab and a secchi disk is deployed to determine clarity at each location.

Water Treatment Monitoring and Performance

Flows through the water treatment system come from multiple sources, including surface run-off, groundwater recovery systems, underground mine dewatering systems and process water from the mill, amongst other inputs. Table 5 outlines the major inflows through the effluent system as well as lime use per month, and Table 6 depicts the volume of water released to the receiving environment monthly. The total volume of contact water treated through the Superpond system was 13,673,057.10 m³, utilizing an estimated 1366.5 tonnes of lime for water treatment.

A reclaim pump is located just upstream from the final effluent discharge point to collect treated water for use in processing or dust suppression to reduce the site requirement for fresh water from Tennent, Arnica and Myra Creeks. Demands for recycled process water increased in 2018 relative to 2017 primarily due to its use in cleaning the mill and



in operational testing; 118,370.85 m³ or 0.87% of total yearly treated volume was reclaimed for use.

Effluent flow is monitored continuously by a 30" Parshall flume with an ultrasonic flow measuring device, located approximately 5 m downstream from the reclaim pumps. The flow rate is recorded every minute in the mill historian, and this information is used to calculate the daily flow. During the year a total volume of 13,554,686.25 m³ of effluent was discharged to Myra Creek as measured at the Parshall Flume. The annual average daily flow was 37,460.43 m³/day, within the authorized rate of annual average discharge of 48,000 m³/day.

Flows to the treatment system from groundwater capture systems are logged by flow meters connected to the pumping systems. The Old TDF underdrain system is logged in the historian at the mill, whereas the Lynx SIS pumps are logged on loggers connected to the pumps, but manually downloaded. Table 5 shows the flows as measured from each of these systems, as well as the volume recycled from the treatment system for use in the mill and for dust suppression. In December 2018, the batteries on the Lynx SIS pumps loggers failed, so only partial data from this system is available for December. In 2018, the Old TDF underdrain contributed approximately 43% of the water treated in the system, ranging from 21% of the total flow in wet season, to 55% of the total flow in dry season. The Lynx SIS contributed 12% of the total flow between January and November when the measurement record is available, ranging from 6% to 18% of the monthly total flows through the effluent system.

Table 5: Superpond Water Treatment System Major Source Volumes by Month

	Lynx SIS (m³)	Total TDF Drain (m³)	Total Treated (m³)	Total Recycled (m³)	Lime Used (tonnes)
January	155,355.08	517,942.24	1,353,020.30	2,810.67	79.78
February	129,331.53	427,290.69	1,010,284.01	78,647.66	218.77
March	119,070.12	366,878.77	661,682.95	28.39	114.81
April	161,312.20	228,535.96	1,088,064.48	162.62	87.24
May	152,874.04	474,888.00	1,206,708.44	-	129.69
June	157,328.57	581,462.41	1,144,330.82	2,009.99	43.06
July	65,224.95	449,472.64	1,011,108.00	1,258.60	87.21
August	118,679.88	434,249.04	849,729.07	330.08	87.10
September	130,259.82	516,679.38	964,184.85	8,179.19	127.56
October	132,479.68	570,194.81	1,166,554.37	15,081.20	87.05
November	99,641.47	621,646.69	1,441,498.52	4,538.46	173.87
December	9,316.74	635,867.02	1,775,891.29	5,324.00	130.36
Annual	1,430,874.09	5,825,107.64	13,673,057.10	118,370.85	1,366.50



Flows from the Price 13 Level Portal are directed to an exfiltration basin referred to as Price Pond. This flow is measured periodically to ensure compliance via a manual measurement taken by measuring the time it takes to fill a container of known volume and calculating the flow rate using the average time of three or more tests. Flows to the Price Pond are authorized at an average annual rate of 3,450 m³/day; measured flows at this location were below the permitted flow rate for this location averaging at 364.62 m³/day. It is estimated that a total of 133,085.02 m³ was discharged to the Price Pond in 2018.

Table 6: Effluent Flow Volumes by Month

	Total to Myra Creek (m³)	Average Daily Effluent Myra (m³)	Total from Price (m³)	Average Daily Effluent Price (m³)
January	1,350,209.64	43,645.82	29,322.81	945.90
February	931,636.36	36,081.57	14,811.43	528.98
March	661,654.57	21,344.61	10,957.99	353.48
April	1,087,901.85	36,268.82	11,351.82	378.39
May	1,206,708.44	38,926.08	10,572.63	341.05
June	1,142,320.83	38,144.36	8,927.67	297.59
July	1,009,849.40	32,616.39	7,827.76	252.51
August	849,398.99	27,410.62	6,646.15	214.39
September	956,005.67	32,139.50	6,556.49	218.55
October	1,151,473.17	37,630.79	8,762.49	282.66
November	1,436,960.06	48,049.95	5,439.66	181.32
December	1,770,567.29	59,196.38	11,908.11	384.13
Annual	13,554,686.25	37,460.43	133,085.02	364.62

Effluent and Receiving Environment Results by Parameter of Concern

The following section provides analyses of results, in particular comparing the receiving environment water quality to the BC Water Quality Guidelines for Freshwater Aquatic Life (WQGs) for the following parameters: total zinc, total copper, dissolved aluminum, total and dissolved iron, total cadmium, dissolved sulfate and nutrients. In instances where a receiving environment sample result has exceeded the applicable guideline in Myra Creek or Buttle Lake, 10-year time-lapse graphs have been provided to demonstrate the changes in parameter concentration over time. Where possible given the scale of the chart, the maximum (acute) and 30-day average (chronic) guidelines are shown as dashed lines on the charts. Cells containing red text indicate an exceeded 30-day mean (chronic) water quality guideline; cells highlighted in pink indicate an exceeded maximum (acute) total water quality guideline, and numbers highlighted in



bold are below the laboratory published Reliable Detection Limit (RDL), but entered as RDL for calculation purposes.

Most of the water quality grab samples have been taken at a frequency of less than 5 times in 30 days, and therefore a comparison to the 30-day average (chronic) water quality guideline is not directly applicable. However, the chronic guideline has been included in the charts for reference. Effluent concentration limits are outlined in PE-06858 by authorized discharge location and are summarized in Table 7.

Parameters not discussed in the summary report are detailed in the Appendices.

Table 7: Permitted Effluent Concentrations

Site Parameter	Tailings Impoundment Supernatant	Myra Ponds	Price Pond (east side)
pH ²		6.5-10 pH Units	6.5-8.5 pH Units
Total suspended solids <110,000 m ³ /day	20	25 mg/L	25mg/L
Total suspended solids >110 000 m ³ / day		50 mg/L	
Total Zinc	0.5 mg/L	1.0 mg/L	1.0 mg/L
Dissolved Zinc	0.25mg/L	0.5 mg/L	0.5 mg/L
Total Copper	0.30mg/L	0.6 mg/L	0.6 mg/L
Dissolved Copper	0.10 mg/L	0.2 mg/L	0.2 mg/L
Dissolved Cadmium	0.003 mg/L	0.005 mg/L	0.005 mg/L
Dissolved Lead	0.030 mg/L	0.05 mg/L	0.05 mg/L
Toxicity (96 hr LC ₅₀)		100%	

For all parameters with hardness-based water quality guidelines discussed in this report, the water quality guidelines were calculated as follows:

- BL-Gold hardness was used for BL-Gold, as well as Karst and Henshaw all depths
- MC-M1 hardness was used for all Myra Creek sampling locations; this sample site is only sampled quarterly, so the average hardness for this location is used in months where a direct measurement is not available.³

Prior to the permit amendment, the Tailings Supernatant from the Old TDF was sampled primarily as an influent source to the Superpond Lime Addition Water Treatment System, even though the permit allowed direct release of this water to the creek when it met permit conditions. Following construction that allowed a large portion

² pH data is included in Appendix D

³ In addition to upstream hardness, Myra Falls calculates the hardness based guidelines for each site using the site-specific hardness for comparative purposes. These are included in the calculation tables as illustration, the determination as to compliance with the guideline is based on MC-M1.



of the Old TDF supernatant to be captured as clean flows that occasionally meet the permit limits, this sampling site is sampled as a potential Effluent as TDF-Effluent (E207740) or TDF-EFF, and a new site was added to capture the water treatment influent at TDF-Dissipater Outlet (E311488) or Dissipater.

The TDF-Effluent location monitors the quality of the flows entering the TDF that may be released to the receiving environment without treatment when permit limits are met, while the TDF-Dissipater Outlet location is intended to capture the contact water from the West side of the site, including contact flows from the surge pond, the Old TDF underdrain system, and the Lynx TDF Spring Drain. All flows from the Old TDF are currently treated for pH and metals concentration through the Superpond and are not discharged to the receiving environment as the infrastructure required to allow this to occur has not yet been constructed and is still undergoing permitting under the BC Ministry of Energy, Mines, and Petroleum Resources (BC EMPR).

In addition to the Effluent from the surge pond, Myra Falls has a second influent monitoring location that was added in the July 5, 2018 amendment. This location known as Mill Run – Off Collection Ditch (E311028) is collected from the surface ditch that collects effluent from the on-site mill facility and the contact water surface run-off from Eastern side of the property. Mill Run-off Collection Ditch and TDF-Dissipater sample sites are intended to characterize Superpond influent to verify the system is functioning as intended, as well as to ensure that the influent water quality is well understood for long-term water treatment needs.

Prior to the July 5, 2018 permit amendment samples were not directly collected to characterize influent. The inflows are now regularly monitored on a quarterly basis at two locations as described above. There were six (6) samples collected at the Dissipater, and two (2) samples collected at the Mill Ditch location in 2018. Full sampling results are included in Appendix C, while a summary of key parameters is included in Table 8.

In general, these influent flows have highly variable concentrations, depending on a number of factors, including but not limited to: weather conditions at the time of sampling, mill operational status, areas underground actively being dewatered, status of the Lynx SIS pumping wells, status of sump pumps, and other similar variables.

The Dissipater influent tends to contain primarily metals in the dissolved fraction, while the Mill Ditch tends to show a lower proportion of dissolved metals. As further samples are collected from these locations, the differences in the two (2) influent source qualities may become better understood.



Table 8: Influent Sample Chemistry - Key Variables

Station	Sample Date	SO4	Zn (d)	Zn (t)	Cd (d)	Cd (t)	Cu (d)	Cu (t)
DISSIPATER	11/01/2018	303	8.68	9.40	0.03320	0.03400	0.92900	1.03000
DISSIPATER	17/01/2018	343	14.40	17.30	0.07450	0.08020	2.07000	2.49000
DISSIPATER	27/04/2018	263	6.17	6.41	0.01570	0.01630	0.47900	0.56100
DISSIPATER	04/05/2018	262	6.02	5.41	0.01490	0.01340	0.48600	0.46500
DISSIPATER	08/08/2018		5.79	5.61	0.01540	0.01500	0.60200	0.57800
DISSIPATER	07/11/2018	209	5.16	5.45	0.01960	0.02010	0.58600	0.67900
MILL DITCH	08/08/2018		0.37	8.00	0.00005	0.02170	0.00506	0.67700
MILL DITCH	07/11/2018	157	12.90	51.80	0.04490	0.19200	0.08630	3.56000
Average		256	7.44	13.67	0.02728	0.04909	0.65542	1.25500

Zinc

Monthly / Quarterly Zinc

Total zinc concentrations in monthly and quarterly surface grab samples for all sampling sites are summarized in Table 9. Water quality guidelines for zinc are hardness based, and are determined by calculation.

Table 9: Total Zinc Monthly Grab Samples, 2018

Total Zinc (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.14500			0.06700	0.06740	0.09360	0.00637
February	0.00100		0.03430			0.11000	0.10300	0.13100	0.01010
March		37.40000	0.03510			0.08160	0.07310	0.09490	0.01200
April			0.04570			0.08340	0.07850	0.09830	0.00665
May	0.00082		0.04980			0.01600	0.01630	0.10700	0.00580
June		31.90000	0.07910			0.00987	0.01050	0.05290	0.00447
July		DRY	0.18300			0.03680	0.03310	0.16100	0.00322
August	0.00010	DRY	0.32500	8.00000	5.61000	0.09320	0.07000	0.18200	0.00303
September		DRY	0.33000			0.13200	0.08950	0.08300	0.00251
October		DRY	0.19700			0.04510	0.04910	0.21400	0.00530
November	0.00073	0.03060	0.36300	51.80	5.45	0.06110	0.06390	0.20500	0.00358
December		0.35300	0.206			0.04400	0.06060	0.26000	0.00650

Mean	0.0007	17.4209	0.1661	29.90	5.53	0.0650	0.0596	0.1402	0.0058
Minimum	0.0001	0.0306	0.0343	8.00	5.45	0.0099	0.0105	0.0529	0.0025
Maximum	0.0010	37.4000	0.3630	51.80	5.61	0.1320	0.1030	0.2600	0.0120
Median	0.0008	16.1265	0.1640	29.90	5.53	0.0641	0.0657	0.1190	0.0056
Stdev	0.0004	20.0212	0.1222	30.97	0.11	0.0369	0.0280	0.0634	0.0029
n	4	4	12	2	2	12	12	12	12
Permit Limit		0.5	1	n/a	n/a			1	
BC WQG max	0.0330					0.033	0.033		0.033
BC WQG 30 day	0.0075					0.0075	0.0075		0.0075

All monthly grab samples collected from the Myra Pond Effluent or Price Pond were within the permit limits for total and dissolved zinc in 2018. The TDF Effluent sampling



location was moved in the permit amendment in July 2018, and samples collected prior to this date were taken from the contact water portion of this flow; the contact water stream from the Old TDF is now sampled at the TDF Dissipater.

The TDF Effluent decant has not yet been constructed so all flows from this location are routed to treatment at this stage; however the water that would report to this decant has been sampled when flowing. TDF-Eff met the discharge limits for total zinc in November and December; however it exceeded the permitted dissolved zinc limit in December and would not have been able to be discharged at this time had the decant structure been in place.

Table 10: Dissolved Zinc Monthly Grab Samples 2018

Dissolved Zinc (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.01690			0.05860	0.06340	0.09490	0.00540
February	0.00990		0.00204			0.09500	0.09740	0.12800	0.00619
March		34.40000	0.00187			0.07670	0.07530	0.09950	0.00782
April			0.00294			0.08050	0.07690	0.09440	0.00601
May	0.00042		0.00449			0.01580	0.01600	0.08500	0.00487
June		32.70000	0.01270			0.00952	0.00892	0.00010	0.00454
July		DRY	0.05250			0.03080	0.03100	0.16800	0.00320
August	0.00010	DRY	0.02540	0.37000	5.79000	0.05970	0.05380	0.19100	0.00183
September		DRY	0.04220			0.08940	0.07480	0.08130	0.00149
October		DRY	0.01740			0.03410	0.03740	0.15100	0.00330
November	0.00054	0.03280	0.06200	12.90000	5.16000	0.06610	0.05410	0.21300	0.00339
December		0.28100	0.01070			0.03900	0.05010	0.23200	0.00550

Mean	0.0027	16.8535	0.0209	6.64	5.48	0.0546	0.0533	0.1282	0.0045
Minimum	0.0001	0.0328	0.0019	0.37	5.16	0.0095	0.0089	0.0001	0.0015
Maximum	0.0099	34.4000	0.0620	12.90	5.79	0.0950	0.0974	0.2320	0.0078
Median	0.0005	16.4905	0.0148	6.64	5.48	0.0592	0.0540	0.1138	0.0047
Stdev	0.0048	19.2923	0.0206	8.86	0.45	0.0285	0.0264	0.0658	0.0019
n	4	4	12	2	2	12	12	12	12
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Permit Limit	n/a	0.3	0.5	n/a	n/a	n/a	n/a	0.5	n/a

Total zinc in Myra Creek at site MC-TP4 and MC-M2 exceeded the 30-day average water quality guideline for all months in 2018 and the Maximum Hardness based water quality guideline in all months except May and June for both locations.

When compared to the average monthly water quality for these locations from 2008 – 2018, water quality at MC-TP4 was generally near average concentrations for that



location; in May, June and December concentrations measured at this locations were lower than the monthly average by more than one (1) standard deviation from the mean.

Myra Creek as measured at MC-M2 was similar to the monthly averages with the exception of June and December when the measured concentrations were below the monthly average by more than one standard deviation from the mean.

Buttle Lake at the Buttle Narrows (BL-GOLD) had concentrations similar to previous years. It exceeded the 30-day average water quality guideline for February and March, but was slightly below average monthly concentrations for this location. Concentrations as measured in June, July and November were higher than average by more than one (1) standard deviation of the mean. Buttle Lake levels were lower in the dry season of 2018 than observed in recent years.

Table 11: Average Monthly Total Zinc Concentrations 2008 - 2018⁴⁵

Average Total Zinc 2008 - 2018 Monthly Grab Samples					
	MC-M1	MC-TP4	MC-M2	BL-GOLD	MP-EFF
January	0.000690	0.088930	0.119691	0.008001	0.22218
February	0.038698	0.099600	0.120473	0.008508	0.19043
March	0.000950	0.099225	0.114791	0.009760	0.18977
April	0.002300	0.099443	0.114245	0.007908	0.01067
May	0.008728	0.041706	0.039538	0.007695	0.09098
June	0.003620	0.032277	0.029746	0.007268	0.07759
July	0.021900	0.039462	0.041491	0.006137	0.07757
August	0.001000	0.074400	0.084891	0.004352	0.16979
September	0.007580	0.079786	0.071509	0.004289	0.19280
October	0.012800	0.070083	0.066473	0.005045	0.15193
November	0.009133	0.086631	0.087718	0.005924	0.19742
December	0.011600	0.143467	0.012189	0.007007	0.23900

⁴ The Old TDF seepage collection system was upgraded in 2008, with the addition of the New Outer Drain (NOD). This resulted in a significant drop in concentrations in Myra Creek relative to previous years. Results prior to the NOD installation have not been included in this analysis to accurately present average water quality in the system since that time.

⁵ August 2015 results at MC-M1 were anomalous and skewed the data set to a higher average, this number has been excluded from the statistical analysis.



Composite Samples

Daily composites were collected from the Effluent at MP-EFF as required. Concentrations were all within the permitted limits for total zinc. Normal seasonal fluctuations were observed with elevated zinc concentrations in effluent generally showing a positive correlation with higher precipitation totals (Figure 7).

Elevated zinc concentrations were also recorded during the dry season in 2018 (July – September); these concentrations were measured while construction works were underway on the Superpond Decant Pipe and the Myra Ponds. These works required that the water levels in Myra Ponds 1 and 2, as well as Superpond be decreased for worker and geotechnical safety. To achieve this low level, ponds 1 and 2 were bypassed, resulting in lower settling time in the system.

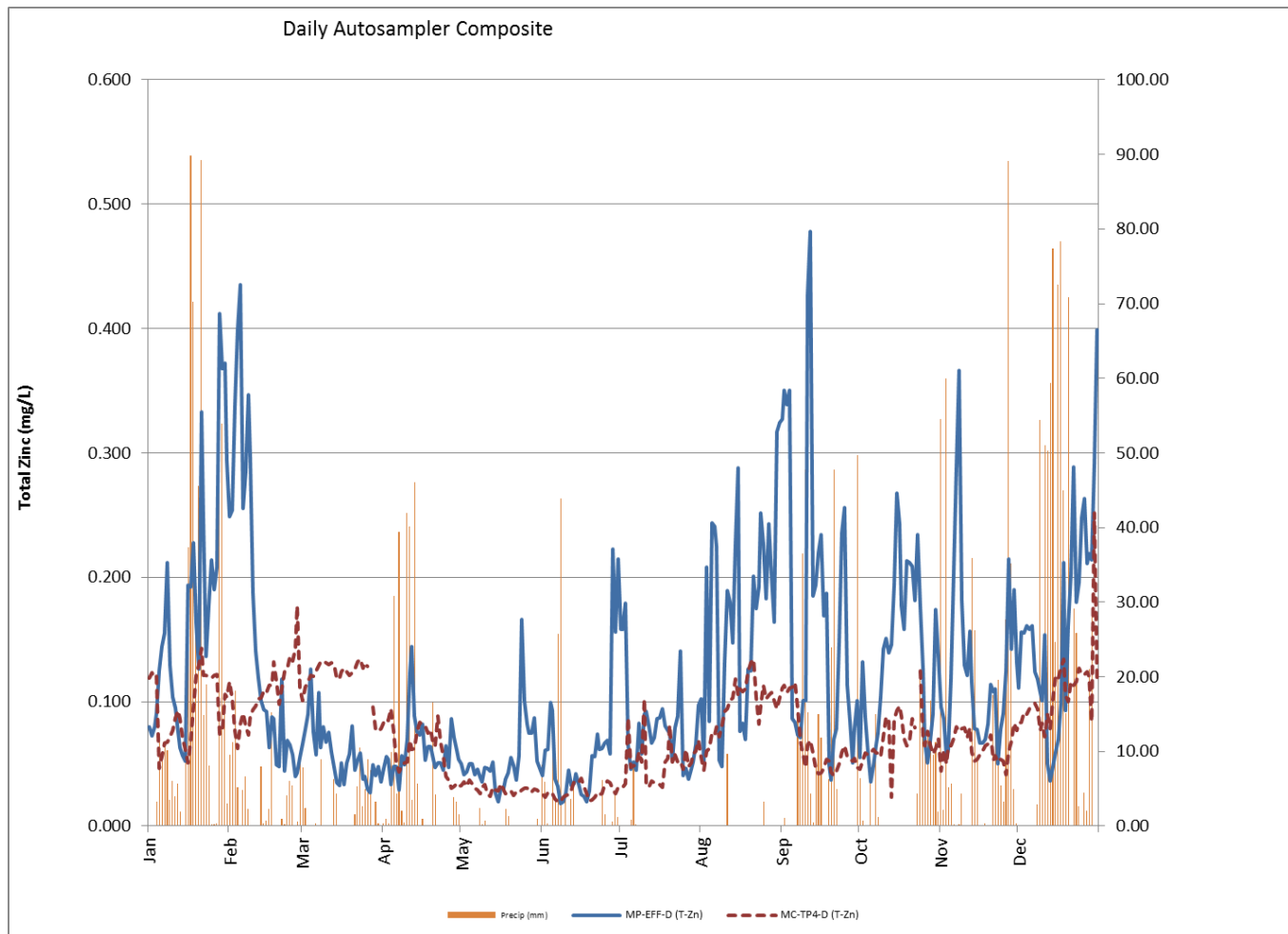


Figure 7: Daily Zinc Concentrations with Precipitation



Average total zinc in the MP-EFF composites was 0.118 mg/L, ranging from 0.018 mg/L (June 8) to 0.478 mg/L (Sept 12). This is within the normal range of the facility as measured in previous years. The concentration measured September 12 is associated with construction activities and was preceded by a moderate rain event the day previous (48.2 mm/ 24 hrs maximum intensity).

Three samples were missed in 2018 at MC-TP4 due to failures in the auto-sampling system.

The 2018 average daily composite zinc concentration at TP4 was 0.074 mg/L ranging from 0.020 mg/L (June 7, 8, and 19) to 0.252 mg/L (December 30). This was within the normal range for this location, with concentrations fluctuating in a similar pattern to the MP-EFF during rain events.

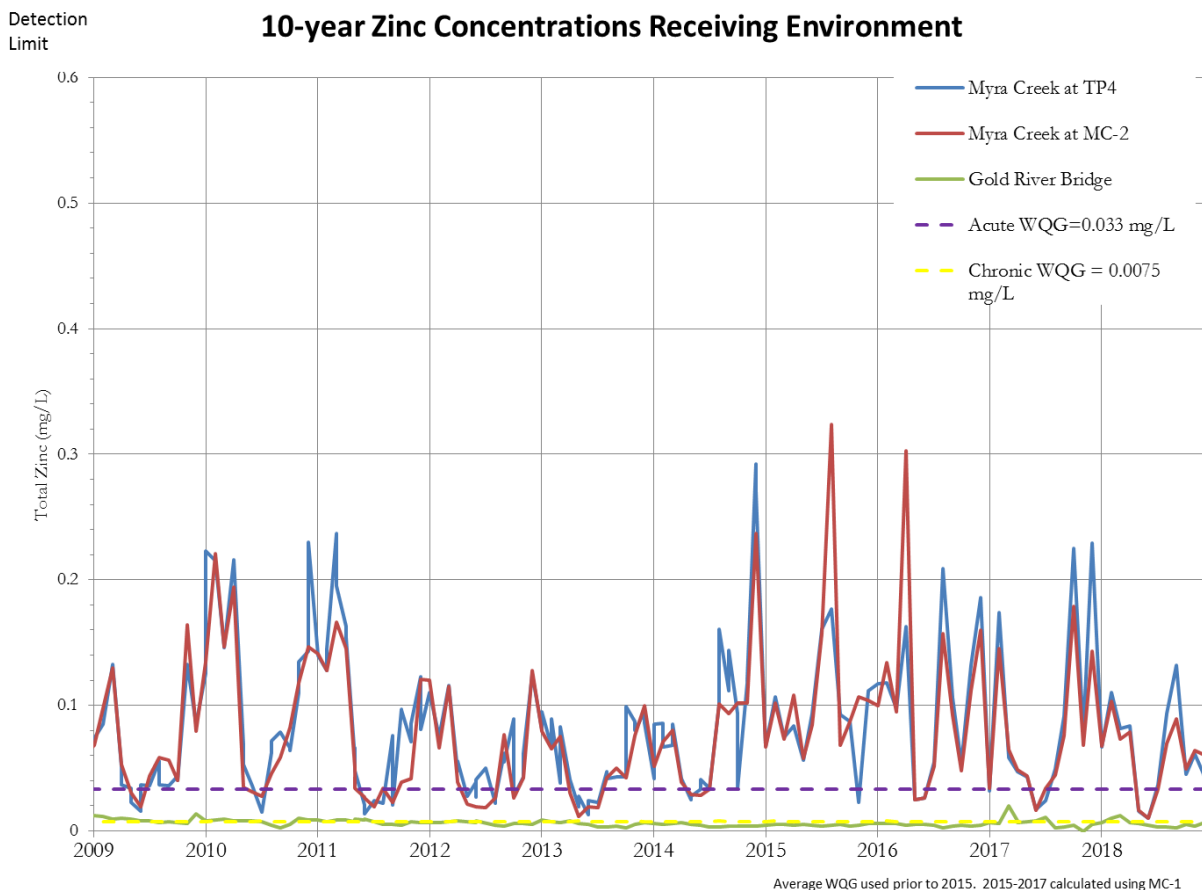


Figure 8: 10-year Zinc Concentrations in Receiving Environment

The concentrations at MC-TP4 exceeded those from MP-EFF 115 times in 2018, less frequently than what was observed in 2017. The cause of this increase in Myra Creek is



thought to be related to groundwater seepage entering the creek from the Lynx Reach (Robertson GeoConsultants, 2018); the installation of the Lynx SIS and the Lynx SSIS is expected to reduce these influences over time (Robertson GeoConsultants, 2018).

A time-series graph depicting the water quality concentrations over time (2009 – 2018) is included as Figure 8 below. The concentrations over time at all locations show seasonal fluctuations with higher concentrations in winter wet season conditions. 2018 concentrations continue to indicate an improvement in peak concentrations relative to the 2014 through 2016 winter season levels reported previously and attributed to deficiencies in the water treatment system such as sludge build-up in the polishing ponds.

Copper

Monthly / Quarterly Copper

Total and dissolved copper concentrations in monthly and quarterly surface grab samples for all sampling sites are summarized in Table 12 and 13. Water quality guidelines for copper are hardness based, and are determined by calculation using the upstream hardness for Myra Creek (MC-M1), and the in situ hardness for the Gold River Bridge sampling location. Cells containing red text indicate an exceeded 30-day mean (chronic) water quality guideline; Cells highlighted in red indicate an exceeded maximum (acute) total water quality guideline.

All grab samples collected from the Myra Pond Effluent, TDF Effluent and Price Pond were within the permitted limits for both total and dissolved copper, however the TDF Effluent decant is not yet constructed and all flows from this location were directed to treatment in 2018.

Total copper in Myra Creek at site MC-TP4 and MC-M2 exceeded the 30-average water quality guideline for all months in 2018. The Maximum Hardness based water quality guideline was exceeded at MC-TP4 in all months except May, June, July, and October, while MC-M2 exceeded in all months except February, May, June, and July.

When compared to the average monthly water quality for these locations from 2008 – 2018, water quality at MC-TP4 was generally near average concentrations for that location. Myra Creek as measured at MC-M2 was similar to the monthly averages with the exception of June when the measured concentrations were below the monthly average by more than one standard deviation from the mean.



Table 12: Monthly / Quarterly Grab Sample Total Copper Concentrations, 2018

Total Copper (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.012700			0.003440	0.003250	0.002480	0.000783
February	0.000110		0.002070			0.004040	0.003610	0.001660	0.001150
March		4.750000	0.004610			0.003940	0.003410	0.001490	0.000686
April			0.005120			0.003990	0.003570	0.001610	0.000649
May	0.000285		0.005170			0.000930	0.001020	0.002820	0.000817
June		7.010000	0.008620			0.000782	0.000787	0.002900	0.000498
July		DRY	0.012500			0.002570	0.001810	0.002120	0.000508
August	0.000054	DRY	0.029100	0.677000	0.578000	0.006770	0.004540	0.002440	0.000736
September		DRY	0.028500			0.009070	0.005070	0.002430	0.000633
October		DRY	0.018600			0.003090	0.003590	0.006560	0.001220
November	0.000238	0.007020	0.030200	3.560000	0.679000	0.003950	0.003760	0.002050	0.000488
December		0.067800	0.026800			0.003570	0.005240	0.004750	0.000720
Mean	0.00017	2.95871	0.01533	2.12	0.63	0.00385	0.00330	0.00278	0.00074
Minimum	0.00005	0.00702	0.00207	0.68	0.58	0.00078	0.00079	0.00149	0.00049
Maximum	0.00029	7.01000	0.03020	3.56	0.68	0.00907	0.00524	0.00656	0.00122
Median	0.00017	2.40890	0.01260	2.12	0.63	0.00376	0.00358	0.00244	0.00070
Stdev	0.00011	3.49721	0.01081	2.04	0.07	0.00226	0.00143	0.00147	0.00023
n	4	4	12	2	2	12	12	12	12
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
BC WQG max/ Permit Limit	0.00313	0.3	0.5	n/a	n/a	0.00313	0.00313	0.6	0.004422 85
BC WQG 30 day	0.00048					0.00048	0.00048		0.001028

Buttle Lake at the Buttle Narrows (BL-GOLD) total copper concentrations were generally similar to concentrations in previous years except in April, May, August and October, when concentrations as measured were higher than average by more than one (1) standard deviation of the mean. The total copper exceeded the 30-average water quality guideline for November, but was slightly below average November concentrations for this location. Buttle Lake levels were lower in the dry season of 2018 than observed in recent years. Dissolved copper significantly exceeded total copper in three samples collected in 2018, as noted by the third party laboratory. This is thought to be related to sampling error and / or contamination introduced to the sample during field filtration or lab processing.



Table 13: Average Monthly Copper Concentrations 2008 - 2018

Average Total Copper 2008 - 2018 Monthly Grab Samples				
	MC-TP4	MC-M2	BL-GOLD	MP-EFF
January	0.004068	0.004759	0.001184	0.01852
February	0.004518	0.005098	0.001526	0.01880
March	0.004875	0.004999	0.000607	0.02508
April	0.003816	0.007199	0.000557	0.01040
May	0.001978	0.001855	0.000606	0.00997
June	0.002065	0.001623	0.000567	0.00935
July	0.002427	0.002106	0.000577	0.01078
August	0.005333	0.004978	0.000575	0.01527
September	0.005240	0.003711	0.000603	0.02313
October	0.004241	0.003279	0.000591	0.01627
November	0.006727	0.005234	0.000586	0.02164
December	0.006007	0.005785	0.000815	0.02413

Table 14: Monthly / Quarterly Grab Sample Dissolved Copper Concentrations, 2018.

Dissolved Copper (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.000825			0.002270	0.002500	0.002260	0.000565
February	0.000477		0.000498			0.002600	0.002400	0.001590	0.000194
March		4.810000	0.000821			0.008470	0.003000	0.001370	0.000628
April			0.000803			0.003330	0.002960	0.001440	0.000597
May	0.000128		0.000949			0.000828	0.000927	0.002020	0.000599
June		7.660000	0.001330			0.001080	0.000558	0.000100	0.000475
July		DRY	0.002080			0.001340	0.001340	0.002090	0.000483
August	0.000067	DRY	0.001320	0.005060	0.602000	0.002180	0.002020	0.002370	0.000499
September		DRY	0.001940			0.002900	0.002410	0.002090	0.000432
October		DRY	0.001410			0.001530	0.001690	0.001470	0.000456
November	0.000212	0.007850	0.002330	0.086300	0.586000	0.007680	0.002450	0.001940	0.000493
December		0.012000	0.001420			0.002320	0.003210	0.002220	0.000550
Mean	0.00022	3.12246	0.00131	0.05	0.59	0.00304	0.00212	0.00175	0.00050
Minimum	0.00007	0.00785	0.00050	0.01	0.59	0.00083	0.00056	0.00010	0.00019
Maximum	0.00048	7.66000	0.00233	0.09	0.60	0.00847	0.00321	0.00237	0.00063
Median	0.00017	2.41100	0.00133	0.05	0.59	0.00230	0.00241	0.00198	0.00050
Stdev	0.00018	3.77769	0.00057	0.06	0.01	0.00247	0.00084	0.00062	0.00011
n	4	4	12	2	2	12	12	12	12
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Permit Limit	n/a	0.1	0.2	n/a	n/a	n/a	n/a	0.20	n/a



A time-series graph depicting the copper concentrations over time in the receiving environment (2009 – 2018) is included as Figure 9 below. Seasonal fluctuations similar to those exhibited in zinc are apparent, as is the improvement in peak concentrations relative to the 2014 through 2016 winter seasons.

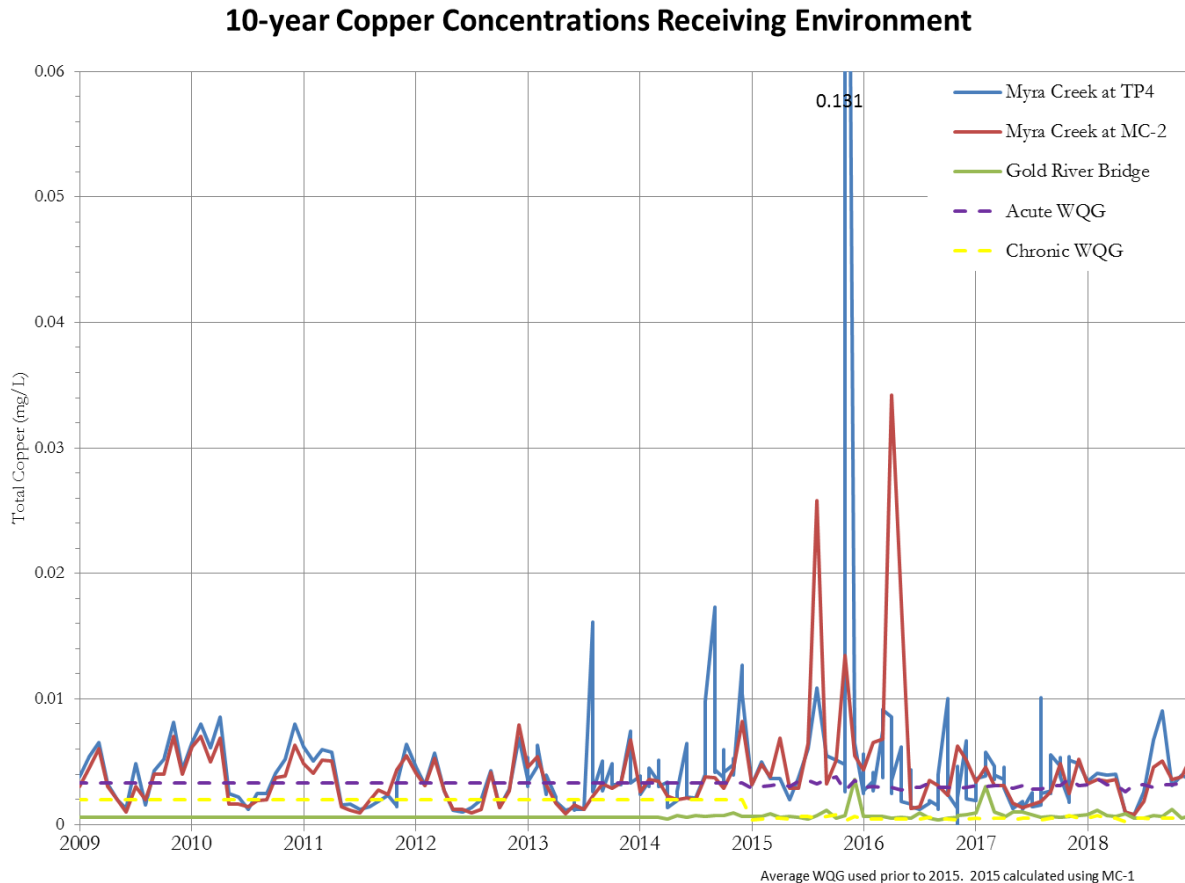


Figure 9: 10 year total copper concentrations in the receiving environment - 2018

Daily Composite Monitoring

Treated effluent is discharged from a point source location listed in the permit as Myra Ponds or MP-EFF (EMS-ID E100666). This location is sampled daily with a Sigma SD900 composite autosampler, which takes 110mL samples every 3 hours (8 aliquots per day totalling one 880 mL composite sample). Daily composites are collected weekly and are shipped to an accredited off-site lab for analysis of total and dissolved metals. Effluent pH and flow are continuously monitored through an automated logging system, with quality control checks performed by operational personnel every 6 hours. Daily effluent pH's and flow volumes are summarized in Appendix D.



Downstream of MP-EFF is monitoring station MC-TP4, located in Myra Creek below Pumphouse #4 (EMS-ID) 206805. Prior to the July 5th amendment, PE-6858 required weekly composite samples to be analyzed at MC-TP4. Daily composite samples at TP4 are collected with a YSI pro sample P series autosampler, using the similar volumes and the same sampling frequency described above; a weekly composite was made for the MC-TP4 location by taking equal portions of the daily composite samples and combining them to create composites which represent the week (This practice stopped July 5th with the new permit). Results are presented in Appendix D.

In previous years only copper and zinc were analysed for daily samples as required by PE-06858; in May 2017 Nyrstar opted to complete the analyses for the full suite of dissolved and total metals for each daily sample and weekly composite collected. This provides more information that can be used to improve the calibration of the Site-Wide Geochemical Model that has been developed to determine the potential future impacts of different water management systems and to assess potential closure plan options prior to design work being completed for permitting. This data is not tabulated for this report, but the laboratory results included in Appendix C include all of the data collected.

Daily/Weekly Composite Copper

Total and dissolved copper were collected as weekly composites using aliquots from the daily composite samples and sent off for analysis until July, 2018 at which point Myra Falls received a permit amendment that removed the requirement from the permit in lieu of low-level detection limit laboratory testing on the daily composites. Figure 10 depicts the total copper concentrations as measured in the daily composite samples collected in 2018.

Daily composites of total copper at MP-EFF averaged 0.009 mg/L, ranging from 0.001 mg/L (several days) to 0.042 (Feb 5), well below the permit limit of 0.60 mg/L.

Average total copper concentration in daily composites at MC-TP4 was 0.004 mg/L, ranging from 0.001 mg/L (several days) to 0.022 mg/L (February 26). There were 72 days during which the concentration of copper was higher at MC-TP4 than at MP-EFF, indicating that like zinc, another source of copper is impacting concentrations in Myra Creek.

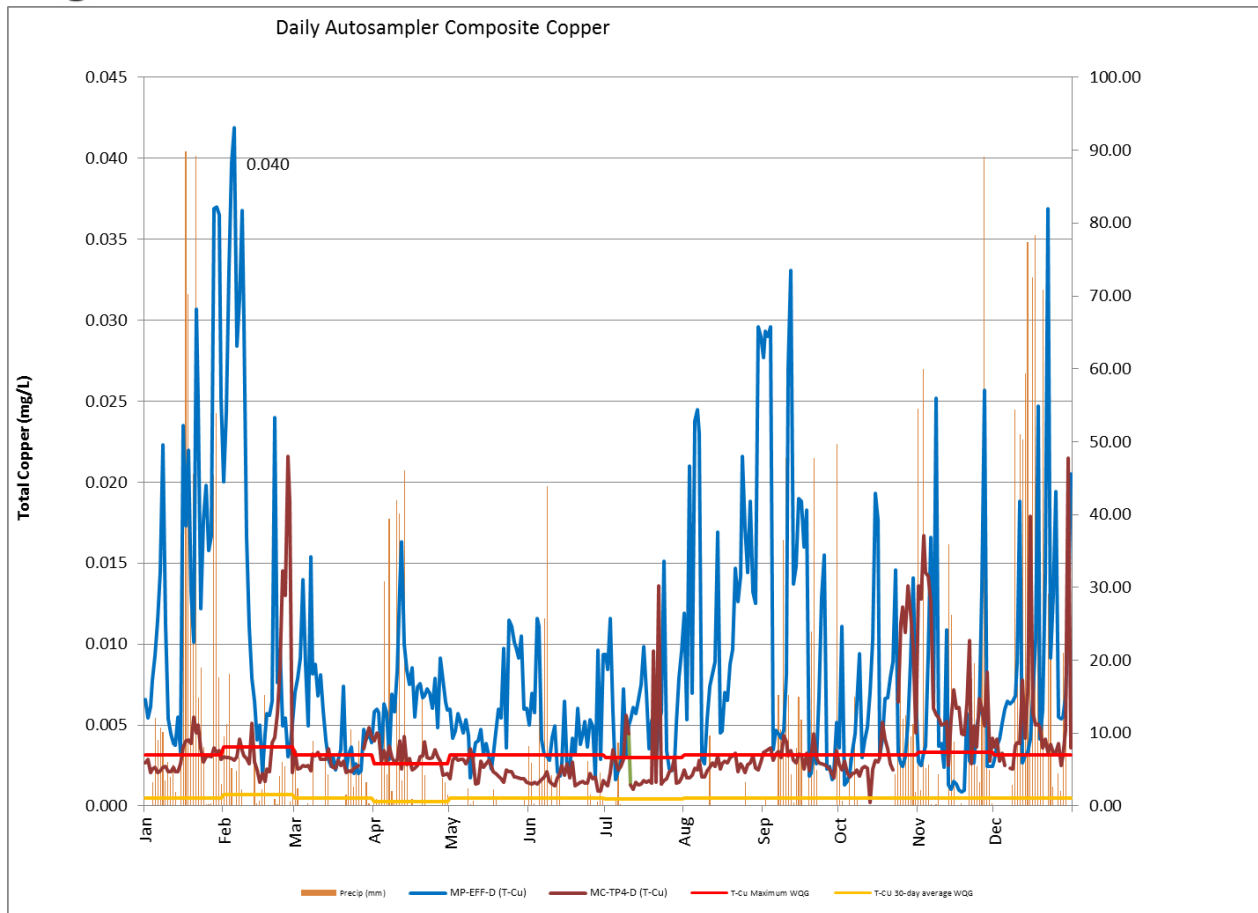


Figure 10: Daily Copper Concentrations 2018

Figure 10 shows chronic (orange) and acute (red) BC WQG's for total copper using monthly hardness at MC-M1. As previously noted, three (3) samples were missed in 2018 at this location due to auto-sampler failures. All available TP4 daily copper results were above the Chronic WQGs in 2018 except one (1) on October 13. Of the dates with available data, 135 days were over the Maximum WQG for this location.

Generally, periods of high copper in MP-EFF can be correlated to precipitation and melt events. Like the zinc concentrations, high concentrations can be seen in copper at MP-EFF during the dry season, which correlates with the timeframe during which Nyrstar was actively working on repairs to the Superpond and Myra Pond Decants, requiring Superpond to be kept at an artificially low level, and Myra Ponds 1 and 2 were taken off line. These changes would have decreased the effective settling capacity of the ponds, resulting in the increase seen in this time frame.

Concentrations at MC-TP4 follow a similar pattern, however the concentration peaks at MC-TP4 indicate a time-delay following a rain or melt event, relative to MP-EFF. This is



thought to be related to groundwater recharge to the creek from the Lynx Reach (Robertson GeoConsultants, 2014); the installation and operation of the Lynx SIS and Lynx SSIS is expected to reduce the impact of this groundwater influence on Myra Creek (Robertson GeoConsultants, 2018)

Lead

Total and dissolved lead grab samples are taken weekly from MP-EFF and shipped to an offsite lab for analysis. Results are presented below in Figure 11. In 2018, no lead samples exceeded the permit limit for dissolved lead; the average weekly total lead concentration at MP-EFF was 0.0033381 mg/L, ranging from 0.000119 mg/L to 0.0221 mg/L. The average monthly concentration for dissolved lead from MP-EFF was 0.0004042 mg/L, ranging from 0.000005 mg/L to 0.0106 mg/L.

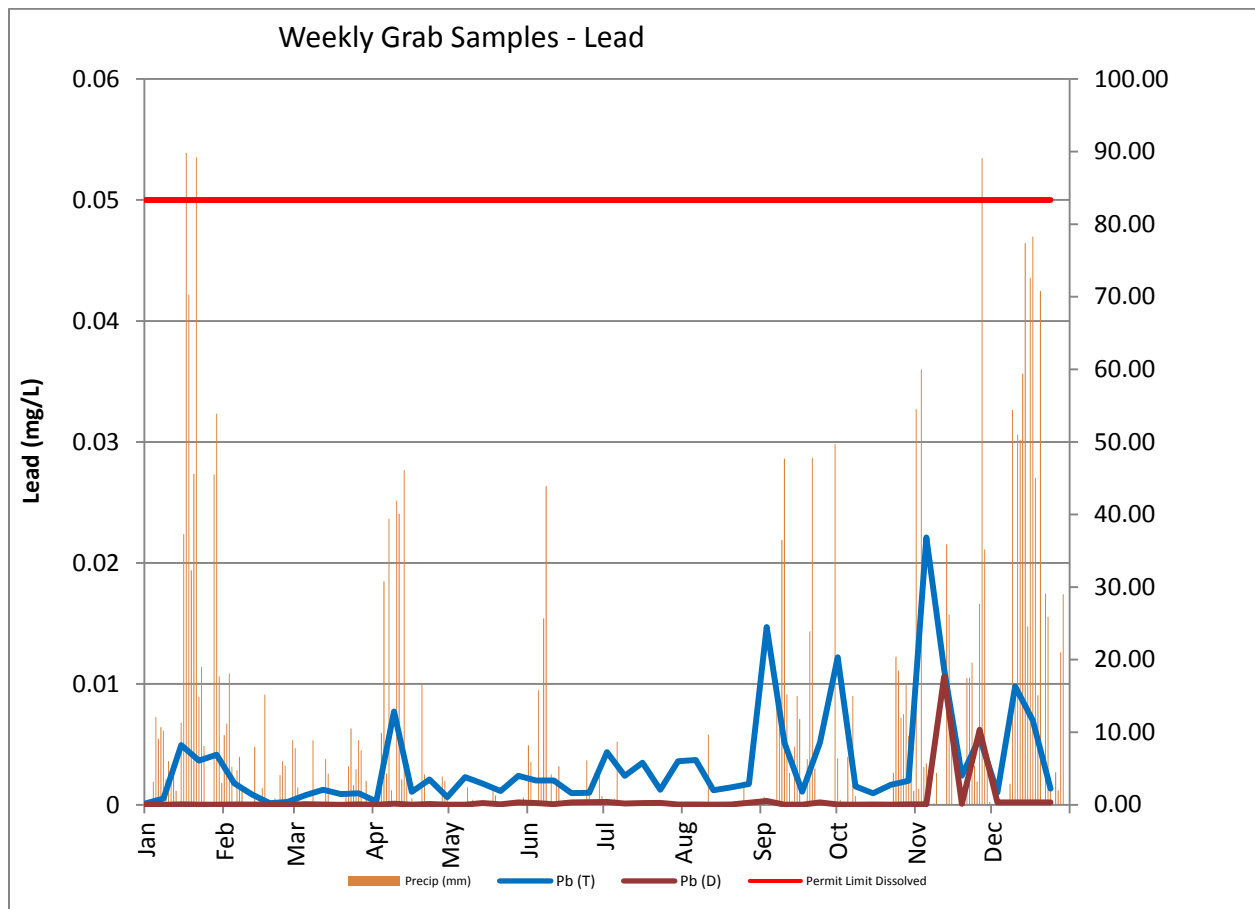


Figure 11: Total Lead Weekly results



Table 15: Monthly / Quarterly Grab Sample Total Lead Concentrations, 2018.

Total Lead (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0005240			0.0000854	0.0000687	0.0014500	0.0002530
February	0.0000270		0.0001380			0.0000747	0.0000676	0.0015600	0.0000510
March		0.6470000	0.0012500			0.0002230	0.0001530	0.0011200	0.0000504
April			0.0002830			0.0000705	0.0000947	0.0007350	0.0000398
May	0.0000093		0.0006380			0.0000674	0.0000629	0.0025400	0.0000998
June		0.7990000	0.0020100			0.0001570	0.0002490	0.0014300	0.0000051
July		DRY	0.0023900			0.0009050	0.0003510	0.0023500	0.0000216
August	0.0000143	DRY	0.0037100	0.1080000	0.0062000	0.0007150	0.0005830	0.0036500	0.0002080
September		DRY	0.0147000			0.0025800	0.0009030	0.0013500	0.0001030
October		DRY	0.0015300			0.0002430	0.0002860	0.0130000	0.0001630
November	0.0001290	0.0005420	0.0221000	14.2000000	0.0096700	0.0020400	0.0011300	0.0024000	0.0000050
December		0.0012500	0.0097900			0.0006100	0.0011700	0.0056800	0.0002000
Mean	0.000045	0.361948	0.004922	7.154	0.008	0.000648	0.000427	0.003105	0.000100
Minimum	0.000009	0.000542	0.000138	0.108	0.006	0.000067	0.000063	0.000735	0.000005
Maximum	0.000129	0.799000	0.022100	14.200	0.010	0.002580	0.001170	0.013000	0.000253
Median	0.000021	0.324125	0.001770	7.154	0.008	0.000233	0.000268	0.001955	0.000075
Stdev	0.000057	0.421500	0.006992	9.965	0.002	0.000834	0.000419	0.003395	0.000086
n	4	4	12	2	2	12	12	12	12
DL Range	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
BC WQG m:	0.00554					0.00554	0.00554		0.01457
BC WQG 30	0.00071					0.00071	0.00071		0.00189

In Myra Creek, there were no samples over the acute water quality guidelines, however MC-TP4 was over the 30-day average water quality guideline in July, August, September and November, while MC-M2 was over the 30-day average in September, November, and December. All samples at Myra Ponds, Tailing Effluent and Price pond were well below permit limits (Table 16).



Table 16: Monthly / Quarterly Grab Sample Dissolved Lead Concentrations, 2018

Dissolved Lead (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0000050			0.0000332	0.0001610	0.0004980	0.0000263
February	0.0000050		0.0000203			0.0000332	0.0000266	0.0014100	0.0000137
March		0.6440000	0.0000348			0.0001710	0.0000450	0.0007050	0.0000440
April			0.0000061			0.0000466	0.0000430	0.0005830	0.0000228
May	0.0000107		0.0000110			0.0000202	0.0000539	0.0008450	0.0000200
June		0.7280000	0.0001520			0.0003000	0.0000219	0.0001000	0.0000427
July		DRY	0.0001030			0.0000487	0.0000525	0.0022000	0.0000050
August	0.0025000	DRY	0.0000241	0.0237000	0.0004970	0.0000428	0.0000416	0.0027400	0.0000050
September		DRY	0.0003150			0.0001580	0.0001270	0.0006880	0.0000142
October		DRY	0.0000109			0.0000269	0.0000361	0.0007850	0.0000050
November	0.0000217	0.0003210	0.0000390	0.0086600	0.0040400	0.0002810	0.0000706	0.0019900	0.0000207
December		0.0002000	0.0002000			0.0002000	0.0002000	0.0022100	0.0002000

Mean	0.000634	0.343130	0.000077	0.016	0.002	0.000113	0.000073	0.001230	0.000035
Minimum	0.000005	0.000200	0.000005	0.009	0.000	0.000020	0.000022	0.000100	0.000005
Maximum	0.002500	0.728000	0.000315	0.024	0.004	0.000300	0.000200	0.002740	0.000200
Median	0.000016	0.322161	0.000029	0.016	0.002	0.000048	0.000049	0.000815	0.000020
Stdev	0.001244	0.397394	0.000098	0.011	0.003	0.000104	0.000058	0.000850	0.000054
n	4	4	12	2	2	12	12	12	12
DL Range	0.000005	0.000005	0.000005	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Permit Limit	n/a	0.03	0.05	n/a	n/a	n/a	n/a	0.05	n/a

Dissolved Aluminum

Monitoring results for monthly and quarterly grab samples are summarized in Table 17 below. Total Aluminum is tabulated in Appendix D. Dissolved aluminum was elevated above the Chronic WQG at the upstream monitoring location MC-M1, as sampled in May of 2018; a similar result was reported for this location in May of 2017. Concentrations decrease further downstream in Myra Creek, indicating that this upstream source is likely the primary driver of the elevated concentrations during this timeframe.

Effluent concentrations of dissolved aluminum are significantly higher than those measured in the creek over the majority of the year; it is expected that the effluent is a key contributor to downstream aluminum concentrations when upstream concentrations are not elevated.

Monthly MC-M2 samples were above the Chronic WQG for October and December while dissolved aluminum at TP4 is above the chronic guideline in January, April, May, September, October, and December. All dissolved aluminum results were below BC's Acute WQG. There is no permit limit set for Dissolved Aluminium.

Table 17: Dissolved Aluminum Concentrations in Monthly Grab Samples 2018

Dissolved Aluminum (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.191			0.0501	0.042	0.00597	0.0108
February	0.0213		0.00492			0.0298	0.0268	0.00278	0.0102
March		16.1	0.11			0.0419	0.0366	0.00395	0.0132
April			0.202			0.0504	0.0429	0.0029	0.01
May	0.0556		0.167			0.0535	0.0487	0.00548	0.0105
June		34.2	0.246			0.0491	0.0419	0.0001	0.0145
July		DRY	0.166			0.0318	0.0298	0.00336	0.0136
August	0.0178	DRY	0.127	0.231	0.802	0.0386	0.0342	0.00455	0.0175
September		DRY	0.151			0.0553	0.0478	0.0038	0.0131
October		DRY	0.266			0.0534	0.0524	0.00274	0.0117
November	0.0382	0.0304	0.252	0.0488	0.68	0.0214	0.0443	0.00339	0.0143
December		0.067	0.539			0.0712	0.0628	0.0061	0.0131

Mean	0.0332	12.5994	0.2018	0.1399	0.7410	0.0455	0.0425	0.0038	0.0127
Minimum	0.0178	0.0304	0.0049	0.0488	0.6800	0.0214	0.0268	0.0001	0.0100
Maximum	0.0556	34.2000	0.5390	0.2310	0.8020	0.0712	0.0628	0.0061	0.0175
Median	0.0298	8.0835	0.1790	0.1399	0.7410	0.0496	0.0425	0.0036	0.0131
Stdev	0.0174	16.2674	0.1280	0.1288	0.0863	0.0135	0.0100	0.0017	0.0022
n	4	4	12	2	2	12	12	12	12
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
BC WQG max	0.10	n/a	n/a	n/a	n/a	0.10	0.10	n/a	0.10
BC WQG 30 day	0.050	n/a	n/a	n/a	n/a	0.050	0.050	n/a	0.050

Dissolved Cadmium

All monthly samples from the Myra Ponds, TDF Effluent, and Price pond were below effluent permit levels for dissolved cadmium. BC WQGs for acute concentrations were exceeded at TP4 and MC-M2 in all months except May, in June only MC-M2 exceeded, and in July only TP4 exceeded. Long term/ chronic levels were exceeded at both sites in all months except May. There is little evidence of an upstream influence on the concentrations of cadmium as 2 quarterly upstream sample results were at or below the MDL of 0.000005 mg/L, while the other 2 were orders of magnitude below the downstream samples (Table 18). The water quality in the effluent does not appear to correlate directly with the cadmium concentrations in the downstream areas, indicating that downstream cadmium concentrations are primarily influenced by groundwater.

Cadmium concentrations in Myra Creek during 2018 show seasonal variations consistent with those recorded in previous years, with the exception of the MC-M1 result for November; it is suspected that the sample taken for MC-M1 in November was mislabelled or contaminated, as the results are not consistent with any previous sampling undertaken in this area. The concentrations for cadmium at both MC-TP4 and MC-M2



were above the acute water quality guidelines for all months except June. Gold River cadmium results were below BC WQG's for all of 2018.

Table 18: Summary of Dissolved Cadmium in Grab Samples 2018

Dissolved Cadmium (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0001500			0.0001440	0.0001500	0.0003950	0.0000155
February	0.0000108		0.0000365			0.0002170	0.0002230	0.0008320	0.0000176
March		0.2150000	0.0000228			0.0001650	0.0001710	0.0005940	0.0000170
April			0.0000162			0.0001720	0.0001680	0.0005380	0.0000187
May	0.0000050		0.0000209			0.0000401	0.0000483	0.0005190	0.0000185
June		0.2260000	0.0000726			0.0000251	0.0000263	0.0001000	0.0000143
July		DRY	0.0002570			0.0000995	0.0000996	0.0011000	0.0000112
August	0.0000050	DRY	0.0002030	0.0000482	0.0154000	0.0002360	0.0001970	0.0012900	0.0000099
September		DRY	0.0002450			0.0003290	0.0002990	0.0004310	0.0000086
October		DRY	0.0001040			0.0001380	0.0001290	0.0005730	0.0000138
November	0.0002480	0.0001870	0.0003670	0.0449000	0.0196000	0.0002520	0.0002000	0.0010400	0.0000118
December		0.0015500	0.0001460			0.0001430	0.0001800	0.0012200	0.0000150
Mean	0.000067	0.110684	0.000137	0.0225	0.0175	0.000163	0.000158	0.000719	0.000014
Minimum	0.000005	0.000187	0.000016	0.0000	0.0154	0.000025	0.000026	0.000100	0.000009
Maximum	0.000248	0.226000	0.000367	0.0449	0.0196	0.000329	0.000299	0.001290	0.000019
Median	0.000008	0.108275	0.000125	0.0225	0.0175	0.000155	0.000170	0.000584	0.000015
Stdev	0.000121	0.126885	0.000113	0.0317	0.0030	0.000087	0.000075	0.000372	0.000003
n	4	4	12	2	2	12	12	12	12
DL Range	0.0000050	0.0000050	0.0000050	0.0030	0.0030	0.0000050	0.0000050	0.0000050	0.0000050
Permit Limit	WQG	0.003	0.005	n/a	n/a	WQG	WQG	0.005	WQG

Cadmium levels in the receiving environment over the last 10 years have been depicted in Figure 12. 2018 is similar to previous years in both concentrations and in seasonal variability.

10-year Cadmium Concentrations Receiving Environment

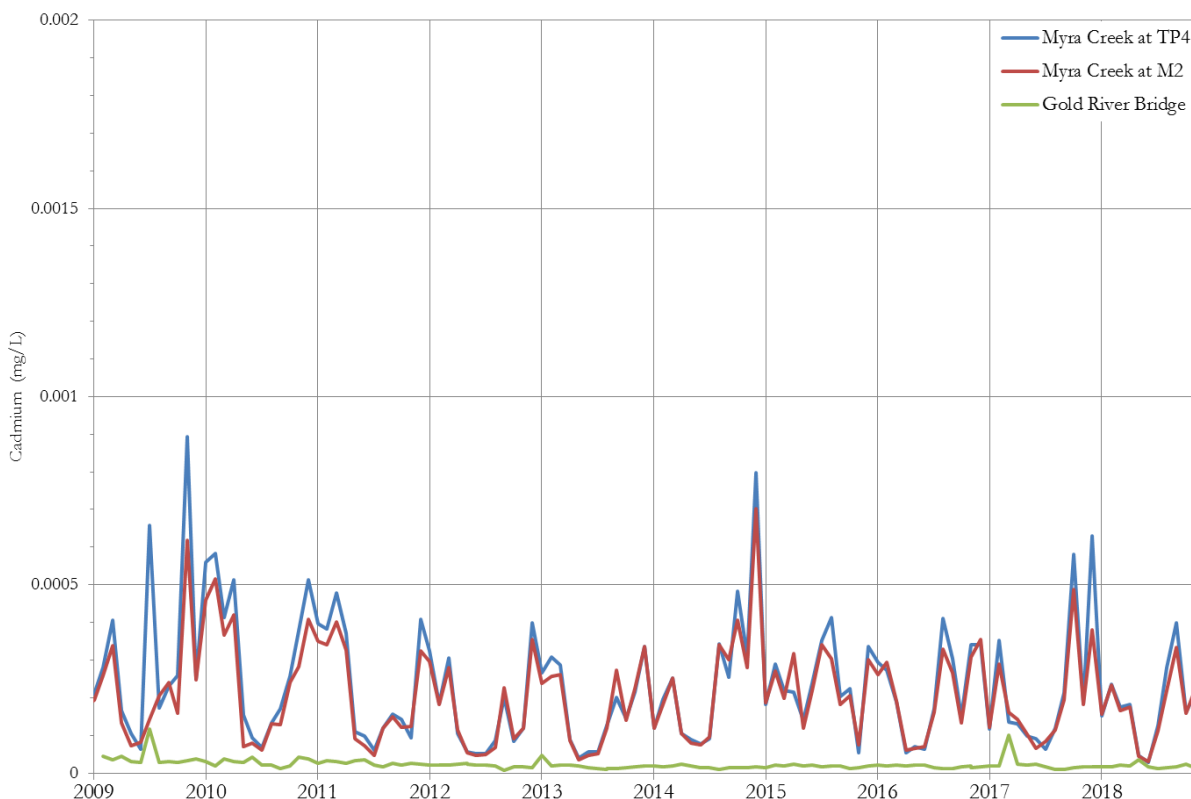


Figure 12: 10 Year Cadmium Concentrations

Other Parameters

The Myra Pond Effluent is sampled on a quarterly basis for acute lethality (toxicity), dissolved sulfate, total nitrogen and total phosphorus. Toxicity is subject to limits under PE-06858, however no sample exceeded these limits in 2018 (Table 19). All rainbow trout 96-hour LC₅₀ test results were >100% vol/vol in the effluent sampling. Nitrogen and phosphates are within the normal range for these parameters in 2018. The TDF Effluent was directed to treatment and not released to Myra Creek in 2018.

Table 19: Quarterly Effluent Grab Sample Results 2018

MP-EFF	Toxicity (96-hr RBT LC ₅₀)	Dissolved Sulphate (mg/L)	Nitrate (mg/L)	Total Phosphorus (mg/L)
Permit Limit	100%	n/a	n/a	n/a
21/02/2018	>100	384	0.0032	0.179
09/05/2018	>100	214	0.0034	0.141
01/08/2018	>100	233	0.0043	0.195
07/11/2018	>100	259	0.0059	0.213



Total Suspended Solids & Flow Monitoring

Daily effluent flow surpassed a flow rate of 110,000 m³/day in six (6) separate events, over nine (9) days in 2018. This occurred January 21, November 3rd – 4th, November 26th, December 13th – 14th, December 17th – 18th and December 20th.

Flow rates above 110,000 m³/day trigger additional sampling; and the Total Suspended Solids (TSS) permit limit is increased from 25 mg/L to 50 mg/L above that rate.

Table 20: High Flow TSS sampling

Date		January-21-18
Maximum instant flow rate (m3/day)		144,255.63
Sample Time / TSS (mg/L)	6:30:00 AM	13.3
	10:00:00 AM	44.5
	2:00:00 PM	18
Date		November-03-18
Maximum instant flow rate (m3/day)		120,942.70
Sample Time / TSS (mg/L)	10:40:00 PM	14.6
Date		November-26-18
Maximum instant flow rate (m3/day)		120,942.70
Sample Time / TSS (mg/L)	10:10:00 AM	23
Date		December-13-18
Maximum instant flow rate (m3/day)		144,097.22
Sample Time / TSS (mg/L)	11:55:00 PM	41.4
	4:30:00 AM	40.2
	1:35:00 PM	42
Date		December-17-18
Maximum instant flow rate (m3/day)		144,102.80
Sample Time / TSS (mg/L)	8:30:00 PM	31.8
Date		December-20-18
Maximum instant flow rate (m3/day)		117,498.89
Sample Time / TSS (mg/L)	10:50:00 AM	40.7

January 21, 2018, the flow rate rose above 110,000 m³/day at 6:30 am and remained above that flow rate until 3:51 pm. The flow reached a maximum flow rate of 144,255.6 m³/day. Three samples were collected during that time, all of

which were below the permit limit for TSS at that flow rate.

The flow rate reached 110,000 m³/day on November 3, at 10:49 pm and remained above that flow range until November 4, at 1:06 am. The maximum flow rate during this event was measured at 112,256.6 m³/day. One sample was collected for this event, it was compliant with permit limits.

November 26, 2018, flows over 110,000 m³/day were reached at 10:07 am, and remained above that rate until 10:48 am, with a maximum discharge flow rate of 120,942.7 m³/day. One sample was collected during this time and was within permitted limits.

December 13, 2018, flows exceeded 110,000 m³/day at 11:52 pm, and remained above that flow rate until 9:54 December 14, 2018. The maximum rate of flow measured was 144,097.2 m³/day. Three samples were collected during this event, all within permit limits.

Flow rates above 110,000 m³/day were measured at 4:39 pm on December 17th, and remained high until December 18, at 1:04 am. The maximum rate of flow in this event was measured at 144,102.8 m³/day. One sample was collected for this event, and was within permit limits.



December 20, 2018 flows over 110,000 m³/day occurred between 11:00 am and 4:30 pm with a maximum discharge rate of 117,498.9 m³/day. One sample was collected at 10:50 am, as the flow rate was increasing toward 110,000 m³/day, however it was collected at a flow rate lower than the permit limit. This sample was therefore subject to the low flow TSS limit, and was not compliant with the permit. This is discussed further in the section on Environmental Non-compliances.

Myra Creek Flow Monitoring

Myra Creek flow is monitored at the “Car Bridge” with a pressure transducer and data logger system. The system logs creek-stage measurements at 15 minute intervals. Stage measurements are converted to flow using a stage-discharge curve calculation. Calculated Myra Creek flows for 2018 are included in Appendix A.

Figure 13 depicts the flow curves for Myra Creek and the effluent from the Superpond Lime Treatment System. The effluent discharged to Myra Creek makes up approximately 3% of the total flow in Myra Creek, ranging from 1.67% to 5.73% of the total Myra Creek flow.

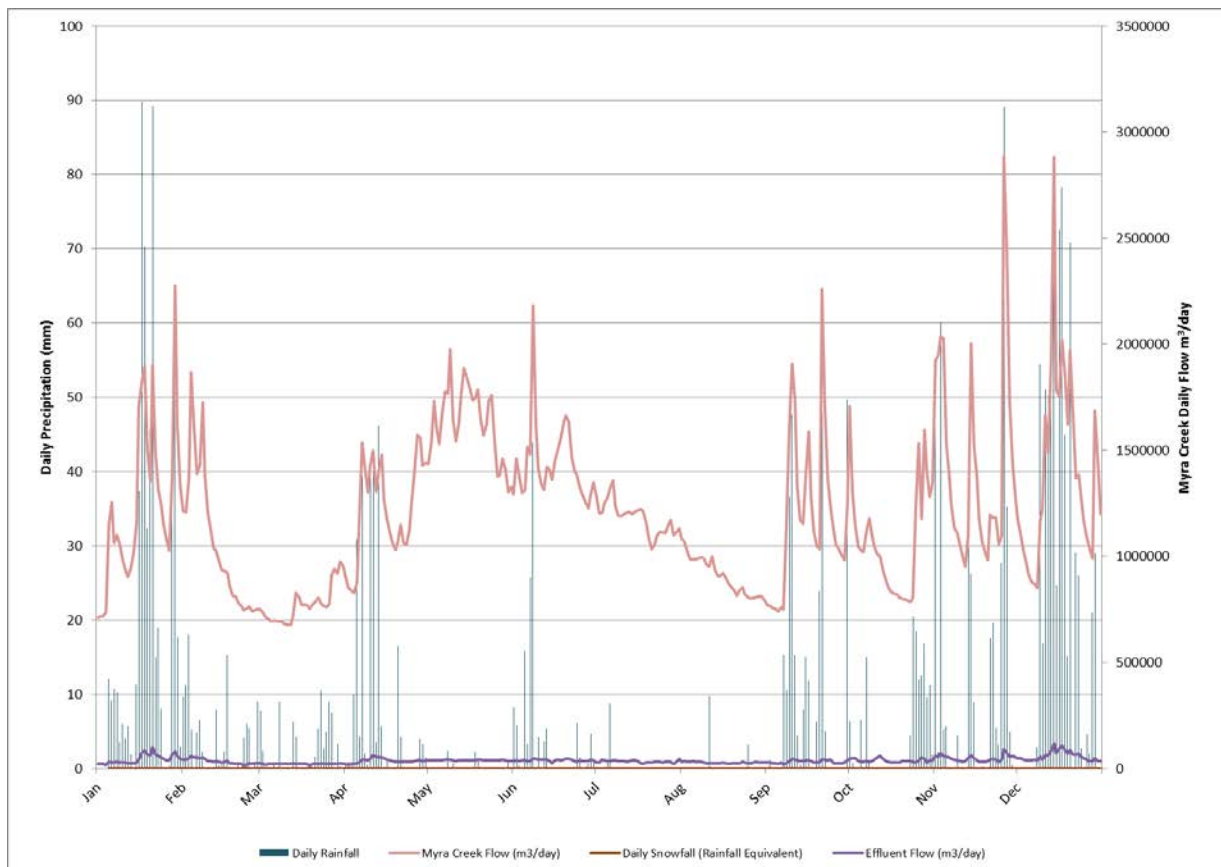


Figure 13: Myra Creek and Effluent Flows with Precipitation



Sewage Treatment Plants

Myra Falls operates two sewage treatment plants (STP's) to treat sewage and grey water. The HW STP is located adjacent to the warehouse and operates using a Klargester Roto Pack system. The Myra STP is located near the cookhouse and was replaced with a new dual-tank Segflow biological treatment system in July 2013, and upgraded with an added Segflow unit in 2018.

Effluent from the sewage treatment plants is pumped to the water treatment system for further treatment before discharge to the receiving environment. The plants were sampled quarterly for total suspended solids (TSS) and biological oxygen demand (BOD), until the permit amendment was received in July; they are now sampled bi-annually. Myra Ponds effluent is concurrently sampled to determine TSS and BOD levels before final discharge to Myra Creek.

Table 21: Grab Sample Results for Sewage Treatment Plants

Limit mg/L	HW STP		Myra STP		MP-EFF	
	BOD	TSS	BOD	TSS	BOD	TSS
	45	60	45	60	45	60
20/03/2018	43.2	25.1	78.6	34.5	<6.0	<4.0
12/04/2018	-	19.8	-	33.5	-	10.0
25/04/2018	23.4	-	82.0	-	<6.0	-
10/05/2018	<6.0	15.8	<6.0	34.0	<6.0	5.3
06/06/2018	<6.0	10.0	91.7	58.5	<6.0	4.3
18/07/2018	-	-	28.0	37.5	<6.0	<4.0
29/08/2018	-	-	27.1	10.7	-	-
19/12/2018	4.2	7.0	6.6	19.7	<2.2	9.6

Upgrades were made to the Myra Sewage Treatment system in 2018; these upgrades were implemented to account for additional flows through the system due to an increase in the camp facility size. When the camp was upgraded, a new kitchen facility was introduced; the new kitchen came equipped with a small grease trap, however it was insufficient for the needs of the camp. As a result of this oversight in the installation, the Myra STP was over limits for Biological Oxygen Demand (BOD) following sampling in Q1; monthly sampling was undertaken while Nyrstar was investigating the cause of the issue, and implementing the repairs. Once the issue was mitigated and the monitoring results were within compliance limits for two consecutive samples, monitoring was returned to the permitted schedule of sampling.



The elevated BOD was not found in the Myra Ponds at the effluent site, indicating that the Superpond Treatment System effectively mitigated the issue prior to the effluent being released to Myra Creek and the issue was limited to the site footprint, however the permit limit was exceeded. Appropriate reports were submitted to the Ministry of Environment's non-compliance reporting program at the time of the incident.

Buttle Lake

Two locations in Buttle Lake are sampled six times per year in February, April, June, August, October and December. The sample stations are located off of the Karst Creek and Henshaw Creek deltas, and are sampled for a variety of chemical, physical and biological parameters at various depths throughout the water column (0-100 m). The sampling depth for these locations was changed in the July 5, 2018 permit amendment as discussed previously. A station map of the Buttle Lake and Gold River stations can be found in Appendix E. Hardness based water quality guidelines were calculated using the hardness values for Buttle Lake as measured at the Buttle Lake Narrows (Gold River Bridge). Physical parameters are also measured at each sample location for temperature, pH, specific, conductivity, and dissolved oxygen at 5 m intervals from surface to 50 m depth and a secchi disk is deployed to determine clarity at each location and are included in Appendix E.

The EMS-ID for the Henshaw sampling station is 0130082; the site is located approximately 2.8 km downstream of the base of Myra Falls, mid-lake off Henshaw Creek. This station is closest to the historic sub-aqueous tailings disposal area in Buttle Lake, in use from 1967-1984. The Henshaw Location prior to the permit amendment was sampled at 0 (surface), 10, 20, 40 and 60 meter depths; this site is now sampled at depths of 0, 10, 20, 40, 60, and 100 meters.

The EMS-ID for the Karst sampling station is 0130090; the site is located approximately 8.5 km downstream from the base of Myra Falls, mid-lake off the Karst Creek boat ramp. The Karst Location is and prior to the permit amendment was sampled at depths of 0, 20, 40, 60, and 100 meters; this site is now sampled at depths of 0, 10, 20, 40, 60, and 100 meters. In 2018 there were two occurrences during the dry months when the Kemmerer sampler hit the bottom of the lake at the Karst location due to insufficient depth to obtain the 100 m sample.

Results generally show higher concentrations at the upstream Henshaw site when compared to downstream samples at the Karst site. Concentrations measured during the first 2 sample campaigns for zinc, copper and cadmium are noticeably greater than at the Karst Creek sample site, suggesting Myra Creek influence decreases in



importance with distance and other inflows from the terminus of Myra Creek into Buttle Lake.

The deep water samples at the Henshaw Creek sampling site (Hen-60) continue to show the highest metal concentrations.

Discussion of Buttle Lake results is limited to zinc, copper and cadmium. These parameters are notable due to upstream (Myra Creek) WQG exceedances. Tables for other parameters are included in Appendix E.

Total Zinc

The metal concentrations at Karst are consistently less than the concentrations at Henshaw, decreasing with distance from Myra Creek and with the introduction of other water sources with significant flow and different chemical signatures such as Ralph River.

Table 22: Total Zinc Concentrations in Depth Profiles

Total Zinc (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.01760	0.01930	0.01990	0.02080	0.02560		0.00812		0.00835	0.00907	0.00981	0.01300
April	0.01410	0.01350	0.01420	0.01860	0.02000		0.00773		0.00829	0.00833	0.00811	0.00859
June	0.00530	0.00529	0.00868	0.01450	0.01630		0.00581		0.00688	0.00826	0.00678	0.00877
August	0.00474	0.00633	0.00822	0.01390	0.01570		0.00430		0.00807	0.00795	0.00838	0.01710
October	0.00509	0.00536	0.00733	0.01330	0.01310	0.02210	0.00543	0.00518	0.00809	0.00841	0.01000	0.25000
December	0.01050	0.01180	0.01530	0.01340	0.01770	0.01910	0.01160	0.00940	0.01360	0.01290	0.01370	0.01270
Mean	0.0096	0.0103	0.0123	0.0158	0.0181	0.0206	0.0072	0.0073	0.0089	0.0092	0.0095	0.0517
Minimum	0.0047	0.0053	0.0073	0.0133	0.0131	0.0191	0.0043	0.0052	0.0069	0.0080	0.0068	0.0086
Maximum	0.0176	0.0193	0.0199	0.0208	0.0256	0.0221	0.0116	0.0094	0.0136	0.0129	0.0137	0.2500
Median	0.0079	0.0091	0.0114	0.0142	0.0170	0.0206	0.0068	0.0073	0.0082	0.0084	0.0091	0.0129
Stdev	0.0054	0.0056	0.0050	0.0032	0.0043	0.0021	0.0026	0.0030	0.0024	0.0019	0.0024	0.0972
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
BC WQG max	0.0330	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
BC WQG 30 day	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075

30-day average hardness based water quality guidelines for total zinc were exceeded at all depths in February, April, and December at both locations. In June, August and October, the 30-day average water quality guideline was exceeded at depth at both locations. The Kemmerer sampler hit bottom when trying to collect Karst at the 100 meter depth in October. Significant sediment entrainment was noted in the sample. The result was a significant increase in concentrations at this depth than previously measured at this site, exceeding the maximum hardness based water quality guideline at this point in time.

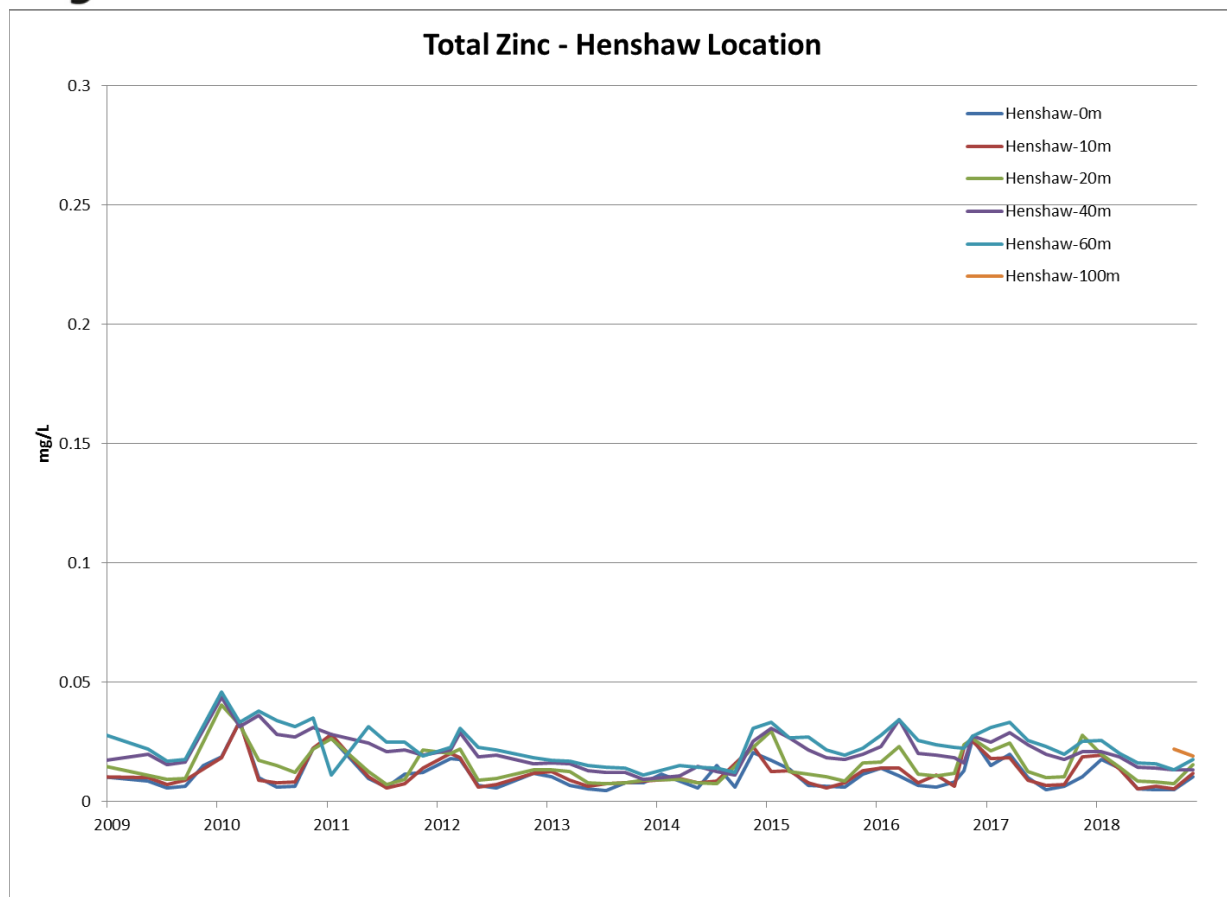


Figure 14: Total Zinc at Henshaw 2018

Besides the Karst 100 meter depth sample in October, the concentrations as measured are consistent with previous years monitoring results, as can be seen in the 10-year time charts provided in figures 14 and 15.

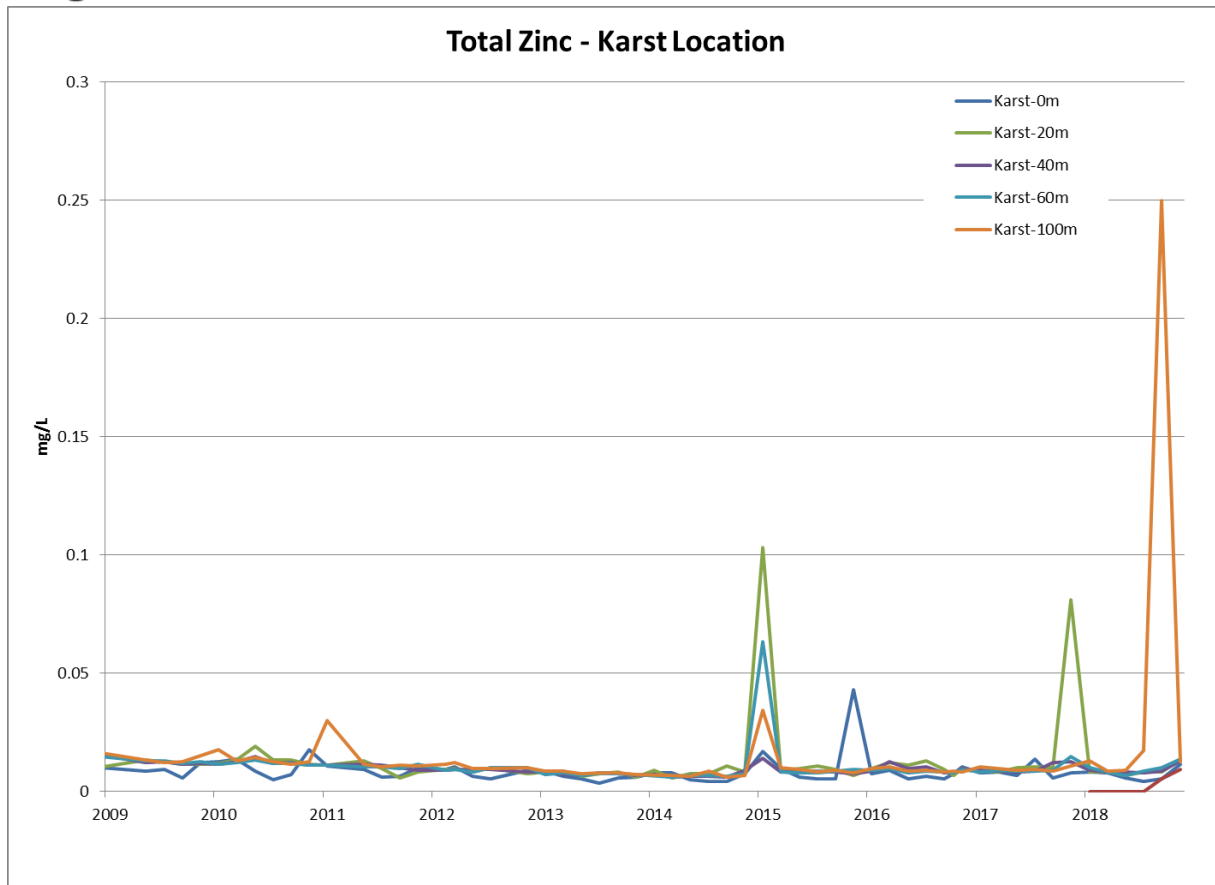


Figure 15: Karst Location - Buttle Lake 2007 – 2017

Total Copper

During 2018, all samples from both sites were within the acute BC WQG's except for Karst 100m in October, which was over the maximum and 30-day average levels as a result of sediment entrainment in the sample collection.

Table 23: Total Copper Concentrations in Depth Profiles

Total Copper (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.001270	0.001460	0.001470	0.001610	0.001790		0.000715		0.000962	0.001050	0.001180	0.002410
April	0.000982	0.000965	0.000953	0.001190	0.001230		0.000631		0.000711	0.000709	0.000858	0.000975
June	0.000607	0.000537	0.000658	0.000968	0.001060		0.000523		0.000697	0.000630	0.000812	0.001620
August	0.000580	0.000590	0.000644	0.000925	0.000973		0.000575		0.000619	0.000818	0.000848	0.003270
October	0.000554	0.000577	0.000933	0.000852	0.001330	0.001680	0.000831	0.000866	0.000606	0.000732	0.001330	0.084500
December	0.000630	0.001010	0.000900	0.002210	0.001190	0.001360	0.000960	0.000670	0.000550	0.000830	0.000830	0.000720
Mean	0.000771	0.000857	0.000926	0.001293	0.001262	0.001520	0.000706	0.000768	0.000691	0.000795	0.000976	0.015583
Minimum	0.000554	0.000537	0.000644	0.000852	0.000973	0.001360	0.000523	0.000670	0.000550	0.000630	0.000812	0.000720
Maximum	0.001270	0.001460	0.001470	0.002210	0.001790	0.001680	0.000960	0.000866	0.000962	0.001050	0.001330	0.084500
Median	0.000619	0.000778	0.000917	0.001079	0.001210	0.001520	0.000673	0.000768	0.000658	0.000775	0.000853	0.002015
Stdev	0.000291	0.000361	0.000300	0.000527	0.000288	0.000226	0.000165	0.000139	0.000146	0.000145	0.000222	0.033776
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
BC WQG max	0.00443	0.00443204	0.00443204	0.00443204	0.00443204	0.00443204	0.004432036	0.00443204	0.00443204	0.00443204	0.00443204	0.00443204
BC WQG 30 day	0.00103	0.00103491	0.00103491	0.00103491	0.00103491	0.00103491	0.001034909	0.00103491	0.00103491	0.00103491	0.00103491	0.00103491



February at Henshaw was over the 30-day average water quality guideline at all depths. At Henshaw, copper was over guidelines at 40 meters depth in April and December, and above guidelines at 60 meters depth for the rest of the year. Figure 16 depicts the 10-year copper concentrations at Henshaw.

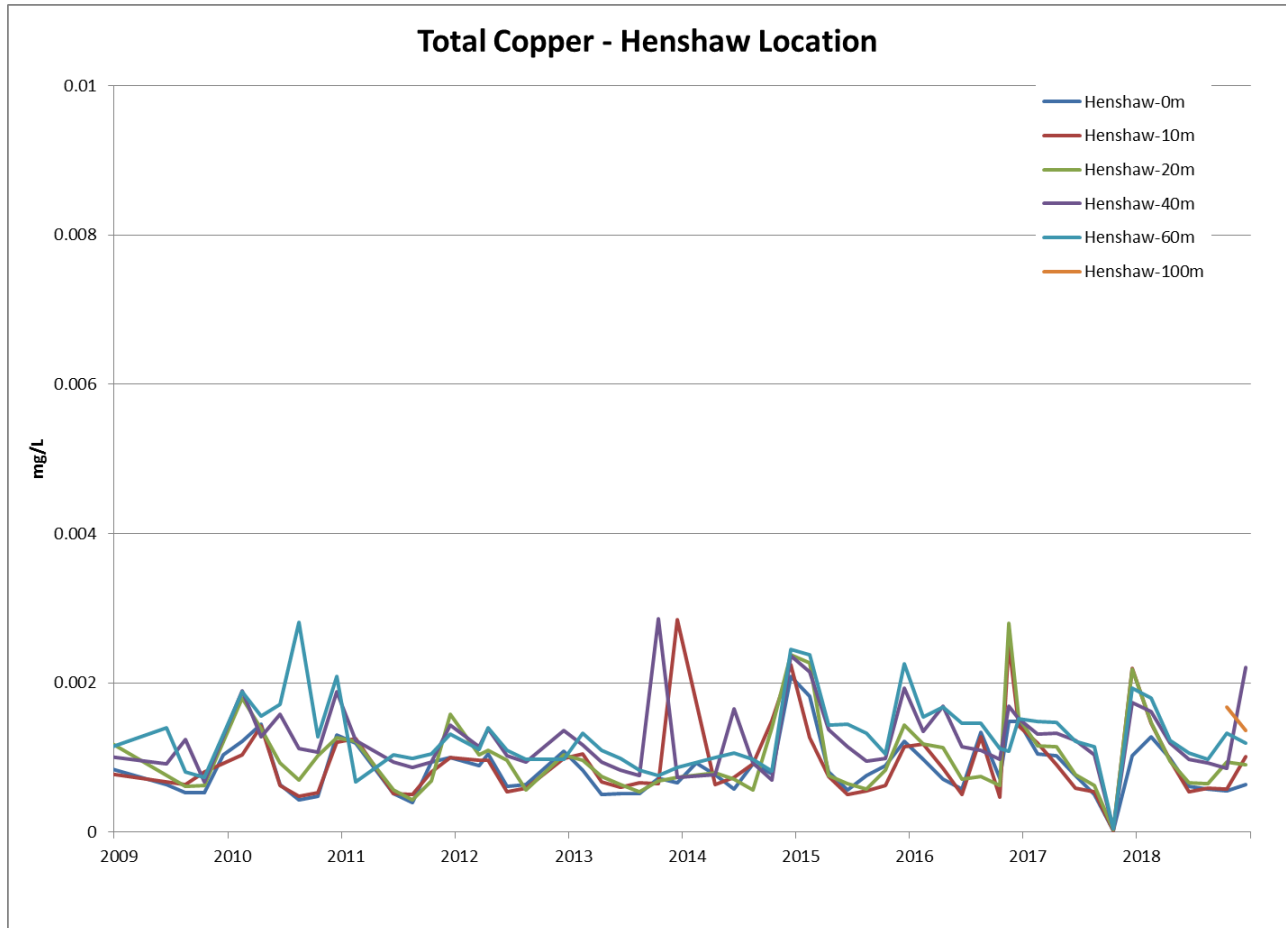


Figure 16: Total Copper Concentrations at Henshaw Creek in Buttle Lake 2009-2018

Copper concentrations at Karst tend to be lower than those measured at Henshaw; the 30-day average water quality guideline was exceeded at Karst at 100 meters depth in February, June and August. In October, the 30-day average guideline was exceeded at 60 meters depth at Karst, and the maximum water quality guideline was exceeded at the 100 meter depth, as a result of sediment entrainment in the sample when the Kemmerer hit bottom at this location.

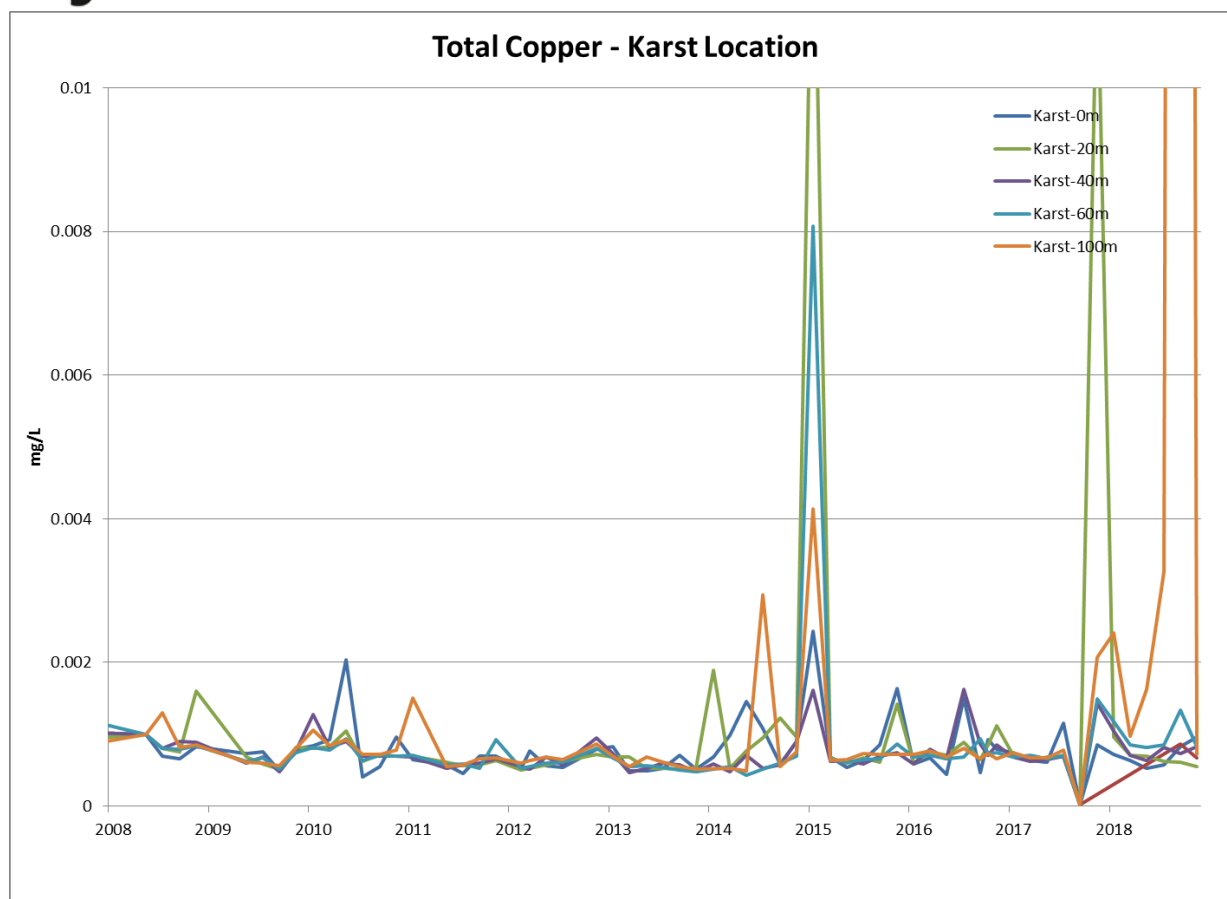


Figure 17: Total Copper Concentrations at Karst Creek in Buttle Lake 2009-2018.

Dissolved Cadmium

All samples collected in 2018 were within BC WQG's for dissolved cadmium. On average, the dissolved fraction of cadmium constitutes 90% of total cadmium concentrations for all Buttle Lake samples in 2018, except the sample from Karst 100 m in October (4% dissolved, not included in the calculation).

Cadmium concentrations at the Henshaw sampling site are generally higher than those at the Karst site throughout the year with the greatest concentrations found at Hen-60 and Hen-100. Charts for 10-year total cadmium trends in Buttle Lake are presented below in Figures 18 and 19.

Table 24: Dissolved Cadmium Concentrations in Depth Profile

Dissolved Cadmium (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.0000498	0.0000539	0.0000562	0.0000590	0.0000694		0.0000251		0.0000228	0.0000244	0.0000224	0.0000262
April	0.0000440	0.0000363	0.0000429	0.0000479	0.0000517		0.0000255		0.0000220	0.0000210	0.0000214	0.0000246
June	0.0000159	0.0000138	0.0000222	0.0000362	0.0000404		0.0000162		0.0000207	0.0000223	0.0000165	0.0000229
August	0.0000100	0.0000163	0.0000236	0.0000365	0.0000394		0.0000117		0.0000225	0.0000229	0.0000208	0.0000125
October	0.0000145	0.0000149	0.0000210	0.0000340	0.0000310	0.0000440	0.0000163	0.0000140	0.0000233	0.0000050	0.0000263	0.0000282
December	0.0000240	0.0000250	0.0000340	0.0000240	0.0000460	0.0000440	0.0000210	0.0000200	0.0000220	0.0000180	0.0000230	0.0000240
Mean	0.0000264	0.0000267	0.0000333	0.0000396	0.0000463	0.0000440	0.0000193	0.0000170	0.0000222	0.0000189	0.0000217	0.0000231
Minimum	0.0000100	0.0000138	0.0000210	0.0000240	0.0000310	0.0000440	0.0000117	0.0000140	0.0000207	0.0000050	0.0000165	0.0000125
Maximum	0.0000498	0.0000539	0.0000562	0.0000590	0.0000694	0.0000440	0.0000255	0.0000200	0.0000233	0.0000244	0.0000263	0.0000282
Median	0.0000200	0.0000207	0.0000288	0.0000364	0.0000432	0.0000440	0.0000187	0.0000170	0.0000223	0.0000217	0.0000219	0.0000243
Stdev	0.0000166	0.0000158	0.0000140	0.0000122	0.0000133	0.0000000	0.0000055	0.0000042	0.0000009	0.0000072	0.0000032	0.0000055
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050
BC WQG max	0.000143	0.000149	0.000150	0.000159	0.000160	0.000169	0.000142	0.000147	0.000145	0.000151	0.000151	0.000175
BC WQG 30 day	0.000077	0.000079	0.000080	0.000083	0.000083	0.000087	0.000076	0.000078	0.000078	0.000080	0.000080	0.000088

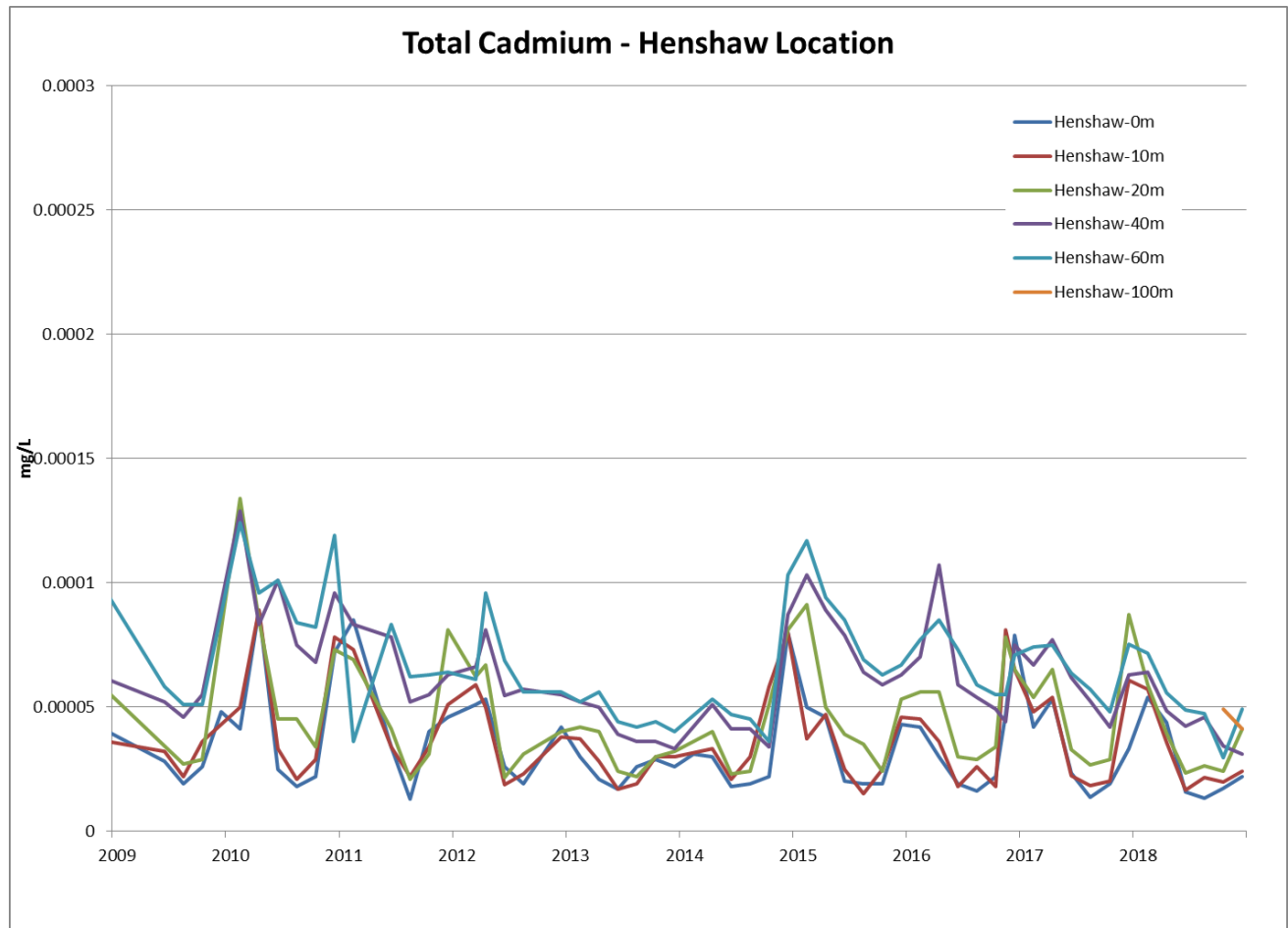


Figure 18: Total Cadmium Concentrations in Buttle Lake at Henshaw 2009-2018.

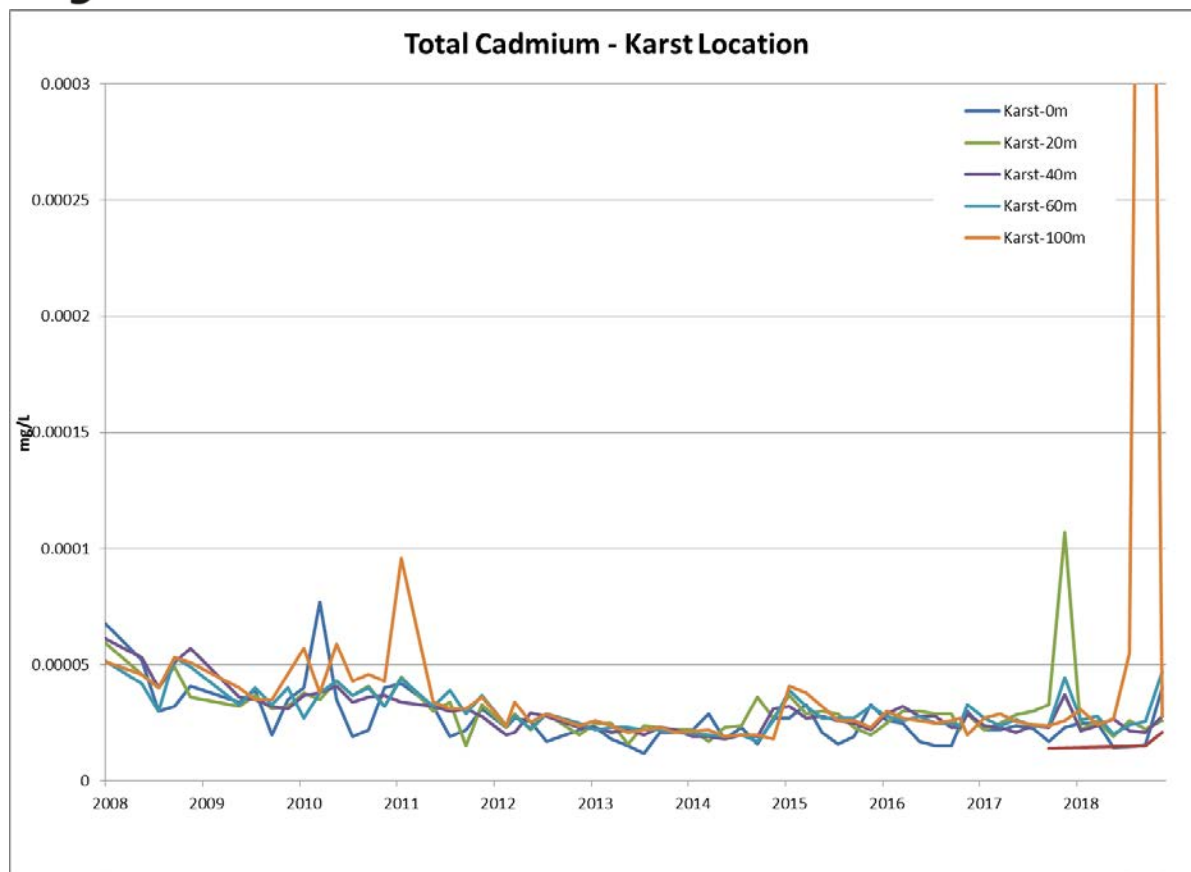


Figure 19: Total Cadmium Concentrations in Buttle Lake at Karst 2009-2018

Groundwater and Seep Monitoring

Groundwater sampling mandated by Permit M-26 and PE-06858 is prescribed to assess potential contaminants from groundwater under Tailing Disposal Facilities (TDFs) impacting Myra Creek, and is restricted geographically in providing site-wide groundwater data used to update the site-wide geochemical model as prepared by Robertson GeoConsultants (December 2016), and most recently updated in 2018 and calibrated with results from 2012 through October 2017 (Robertson GeoConsultants, 2018). This model will be reviewed and updated at least every five years to ensure it is up to date and the results will inform mine waste management, water treatment strategies, and closure planning. Monitoring is divided into two major programs, groundwater well sampling and seepage sampling.



Lynx Seepage Interception System

Downstream sample concentrations are largely driven by groundwater influences, in particular from the Lynx TDF Reach (Robertson GeoConsultants Inc., July 2014). To mitigate the effect of contaminated groundwater on Myra Creek, as per designs and recommendations from a hydrogeologist at Robertson GeoConsultants, Myra Falls has installed a Seepage Interception System (SIS) downgradient of the Lynx TDF designed to recover impacted groundwater from the Myra Valley aquifer and send it to treatment. The Lynx SIS consists of a fence of three pump back wells which are predicted to provide measured improvement in water quality in the receiving environment as more contaminated ground water is captured, the water table is lowered, and contaminated groundwater migration is limited (Robertson GeoConsultants Inc., December 2016). Activation of the Lynx SIS pumps was completed in September of 2017 and the system has been operational from that time.

Lynx Shallow Seepage Interception System

A change to the seepage area between the Car Bridge and the Old TDF, downslope of the Superpond, was identified in early 2018. Seeps previously noted in the upper bank reporting to 25 Sump had not expressed, but a new area of seepage directly into Myra Creek had developed.

The area was identified when a toxicity sample was collected for an unrelated bypass event, and indicated impacts that did not correlate with the effluent that had bypassed the system. Further investigation indicated that as many as ten (10) small, discrete seeps had developed on the bank of Myra Creek in this area; poor quality, low flow seeps detectable within a meter of the bank with a pH meter were emanating from the bank at or just below creek elevation.

This new seepage area was reported to the BC Ministry of Environment and Climate Change Strategy (MoE), as well as other regulators when it was identified; under direction of the MoE, Nyrstar worked with Robertson GeoConsultants and Wood Environment and Infrastructure to develop a mitigation strategy to prevent further impacts to Myra Creek. This plan included a reduction of standing water upslope of the identified seepage area, and a trial dewatering system to determine if it was possible to reduce the seepage.

A series of five additional pumping wells was installed in 2018 south of the Superpond and referred to as the Lynx Shallow Seepage Interception System (Lynx SSIS). The drilling and installation of the wells was supervised by a representative of each consulting company. Nyrstar commissioned Canadian Dewatering to set up a trial



vacuum dewatering system that was operated from May through June. The groundwater model for the area was updated based on the trial, and recommendations were provided for a longer term mitigation of the seepage area in a report on the outcomes of the trial provided to the MoE as part of the follow-up reporting (Robertson GeoConsultants, 2018).

The dewatering well net was effective at reducing the flows (Robertson GeoConsultants, 2018) and following the initial test Nyrstar has opted to install four submersible pumps in the wells to draw down the local water table to a level that prevents recharge to the creek. The system will be fully active in early 2019; the submersible pumps are triggered by water elevation, and reclaimed water will be directed to the Superpond Lime Addition System for treatment before being released to Myra Creek via the effluent system. Monitoring of the system is ongoing, and will be reported on in subsequent reports and updates of the Geochemical Model for the site.

Seep Monitoring

Seeps are monitored when flowing, generally associated with precipitation events larger than 60 mm/day or 80 mm over two days. Flow rates are estimated and water is sampled for quality if there is sufficient flow.

Four separate groundwater seep systems have been broadly identified and are monitored during high precipitation events if flow is observed, as described in Table 25.

Two seep complexes previously reported upon as the “APA” and “Main Spring” seep complexes were directed into underdrain systems, altering flow volume and quality as a result of the LLDD construction completed in 2016. These are monitored separately as TDF-EFF and are no longer considered as part of the seepage monitoring system.

Table 25: Groundwater Seep Systems

Lynx Seep System	A system of 5 seeps that express during heavy rains flowing from the toe of waste rock dump one and the Lynx TDF Berm.
Superpond Seep System	A system of 4 seeps that express during heavy rains flowing from the Superpond embankment road construction material.
Warehouse Yard Seep	A single seep identified at the bottom of the warehouse yard, thought to be occurring as a result of infiltration through the warehouse yard itself. Observed during prolonged severe precipitation, flow enters the water treatment system adjacent to the discharge and is blended with the treated water prior to discharge to Myra Creek.
Pumphouse 4 Seep System	Seeps emanating from rip-rap up gradient of Pumphouse #4.
Car Bridge / 25-Sump Seeps	A system of seeps emanating from the bank of Myra Creek between the Car Bridge and the Old TDF.



As a result of construction activities between 2016 and 2018 seasons, the Lynx Seeps and the Superpond Seeps have not been observed. Monitoring during precipitation events in these areas is ongoing, and these seeps will be sampled if they recur.

The Warehouse Yard Seep was observed once in 2018. Concentrations were lower than average concentrations for major analytes as depicted in Table 26.

Table 26: Warehouse Seep Results 2014 - 2018

SampleDate	SO4 (d) (mg/	Cu (d) (ug/L)	Zn(d) (ug/L)	Cd (d) (ug/L)	Fe_d (ug/L)
November-28-14	192	787	12000	45.6	7.3
November-19-17	161	371	11200	43.3	5
November-25-17	224	451	6370	26.1	12.6
November-26-17	201	564	11400	42	5
January-18-18	149	81	3880	16	1.2
Average	185.4	450.8	8970	34.6	6.22

The Pumphouse 4 Seep System was observed six times in 2018 and sampled twelve times in 2018. Results for the lower seep (Seep B) are generally lower than previous sampling results, while the upper seep (Seep A) continues to show improvement following the 2016 construction of the LLDD. These seeps were routed into the Pumphouse 4 Sump in 2018 via a sump pump installed in a low lying area where the seepage collected to prevent the water from migrating into Myra Creek.

Table 27: Pumphouse 4 Seep B (lower)

SampleDate	SO4 (d) (mg/	Cu (d) (ug/L)	Zn(d) (ug/L)	Cd (d) (ug/L)	Fe_d (ug/L)
November-02-16	81.8	31.2	607	2.94	16.4
February-16-17	32.5	9.26	182	0.838	4.2
November-14-17	56.7	7.6	234	1.24	4.4
November-16-17	56.9	9.21	256	1.34	5
November-19-17	67.7	11.1	302	1.54	2.2
November-22-17	123	50.9	1090	4.42	2.8
November-24-17	166	344	2110	8.93	1.2
November-26-17	131	224	1460	5.66	1.1
December-01-17	94.5	83.4	779	3.12	5.1
January-12-18	34.5	7.87	134	0.62	2.9
January-18-18	37	11.6	211	1.02	2.1
January-19-18	85.4	27	496	2.17	1.2
April-07-18	34.5	5.42	138	0.725	4.1
April-11-18	34	3.73	104	0.609	1.1
April-13-18	35	6.78	161	0.923	2.7
Average	71.37	55.54	550.93	2.41	3.77



Table 28: Pumphouse 4 Seep A (upper)

SampleDate	SO4 (d) (mg/	Cu (d) (ug/L)	Zn(d) (ug/L)	Cd (d) (ug/L)	Fe_d (ug/L)
February-06-15	78.7	50.8	811	3.37	16.7
October-22-15		263	1220	5.89	7.7
December-03-15	28.2	9.34	182	0.783	54
December-08-15	82.5	54.7	884	3.28	39.9
December-08-15	103	94	1300	5.43	30.3
December-09-15	118	152	2140	7.5	7.9
December-09-15	165	437	1480	6.04	46.2
December-09-15	167	508	1620	6.74	39.6
December-09-15	137	148	2190	9.04	7.5
January-27-16	13.1	2.48	35.9	0.21	5.3
November-02-16	65.5	24.9	472	2.3	6.8
February-16-17	32.1	17.1	212	1.04	3.1
February-16-17	81.6	16.4	176	1.13	3.3
October-18-17	109	12.1	730	3.95	3.7
October-18-17	24	15.1	127	0.624	41.8
October-18-17	10.3	1.82	6.73	0.0497	35.8
November-14-17	42.1	6.86	193	1.11	3.4
November-16-17	42.2	8.16	245	1.29	2.9
November-19-17	60.4	14	524	2.23	2.7
November-22-17	27.4	1.65	75.7	0.573	7
November-24-17	30	1.78	108	0.688	4.2
November-26-17	32.6	6.75	241	1.11	4.1
December-01-17	24	4.11	127	0.601	14.5
January-12-18	18.4	2.79	60.1	0.342	2.3
January-18-18	31.4	2.02	105	0.691	5
January-19-18	24.7	3.96	142	0.666	2.9
April-07-18	7.4	0.608	0.55	0.0233	6.8
April-11-18	17	1.94	35.2	0.401	4.3
April-13-18	23	2.5	65.4	0.482	6.4
Average	56.99	64.27	534.78	2.33	14.35

Seeps in the Car Bridge / 25 Sump area are summarized in Table 29. These seeps were not directly observed after June 2018. These seeps will be monitored during the spring melt in 2019; it is expected that the operation of the Lynx SSIS will reduce the impact and volume of the seeps noted in this area.



Table 29: Car Bridge / 25 Sump Seeps

Station	SampleDate	SO4 (d) (mg/L)	Cu (d) (ug/L)	Zn(d) (ug/L)	Cd (d) (ug/L)	Fe_d (ug/L)
#25S-SEEP	December-12-14	1200	6980	53300	193	492
25 SUMP SEEP	January-29-18	47.4	17.9	649	2.95	25
25 SUMP SEEP	February-07-18	161	204	2900	6.48	1
25 SUMP SEEP	February-16-18	61.4	3.47	566	0.941	1.2
CARBRIDGE SEEP	June-04-13	104	67.6	2590	4.74	61.4
CARBRIDGE SEEP	February-07-18	134	99.1	3740	6.64	1.2
MW13-19 SEEP	April-04-18		7.91	975	1.21	1
MW13-19 SEEP	May-02-18	116	608	3720	13.1	7
MW13-19 SEEP A	February-07-18	302	1900	13700	43.9	5
MW13-19 SEEP B	February-07-18	191	1040	7490	22.1	5
MW13-19C SEEP	February-16-18	64.8	11.2	931	1.34	1
PIPE BRIDGE SEEP	June-04-13	151	677	4720	15	4.7
PIPE BRIDGE SEEP	February-07-18	47.8	57.8	1060	2.15	2.5
PIPE BRIDGE SEEP	February-16-18	99.5	86.1	2080	4.03	1
RIPRAPSEEP	December-12-14	2140	8980	88000	324	9390
SHACK SEEP	February-07-18	287	1380	12900	34.8	5
SHACK SEEP	February-16-18	265	1280	9410	31.7	4.3
SHACK SEEP	April-04-18		678	4100	14.8	4.2
SHACK SEEP	May-02-18	134	670	4550	14.6	6.3
SHACK SEEP 1	June-05-18		196	1400	5.07	1
SHACK SEEP 2	June-05-18		369	2060	7.57	1.4
	Average of all	323.88	1205.38	10516.24	35.72	477.20

Groundwater Well Monitoring

Groundwater results are grouped by region; the results are discussed by area in the following paragraphs. As the wells were all installed post-mining disturbance, no baseline data is available for direct comparison; results are instead compared to previous year's data and the geochemical model where applicable. The data has been included in Appendix F. Results of groundwater monitoring were compared to all results collected for these sites from 2011 to date.

The Outer Drain collects seepage from the Old TDF to prevent it entering Myra Creek in what is referred to by Robertson GeoConsultants as the "Old TDF Reach". A series of 8 groundwater wells located in this area are monitored to determine the water quality in the drains. Sampling results for these wells were generally similar to the previous year's seasonal average concentrations; overall averages for the reach were within one standard deviation of the mean for the primary contaminants of concern. Individual wells had variations relative to each other as well as previous years; some wells were above previous averages, while others had a more pronounced decrease in concentration.

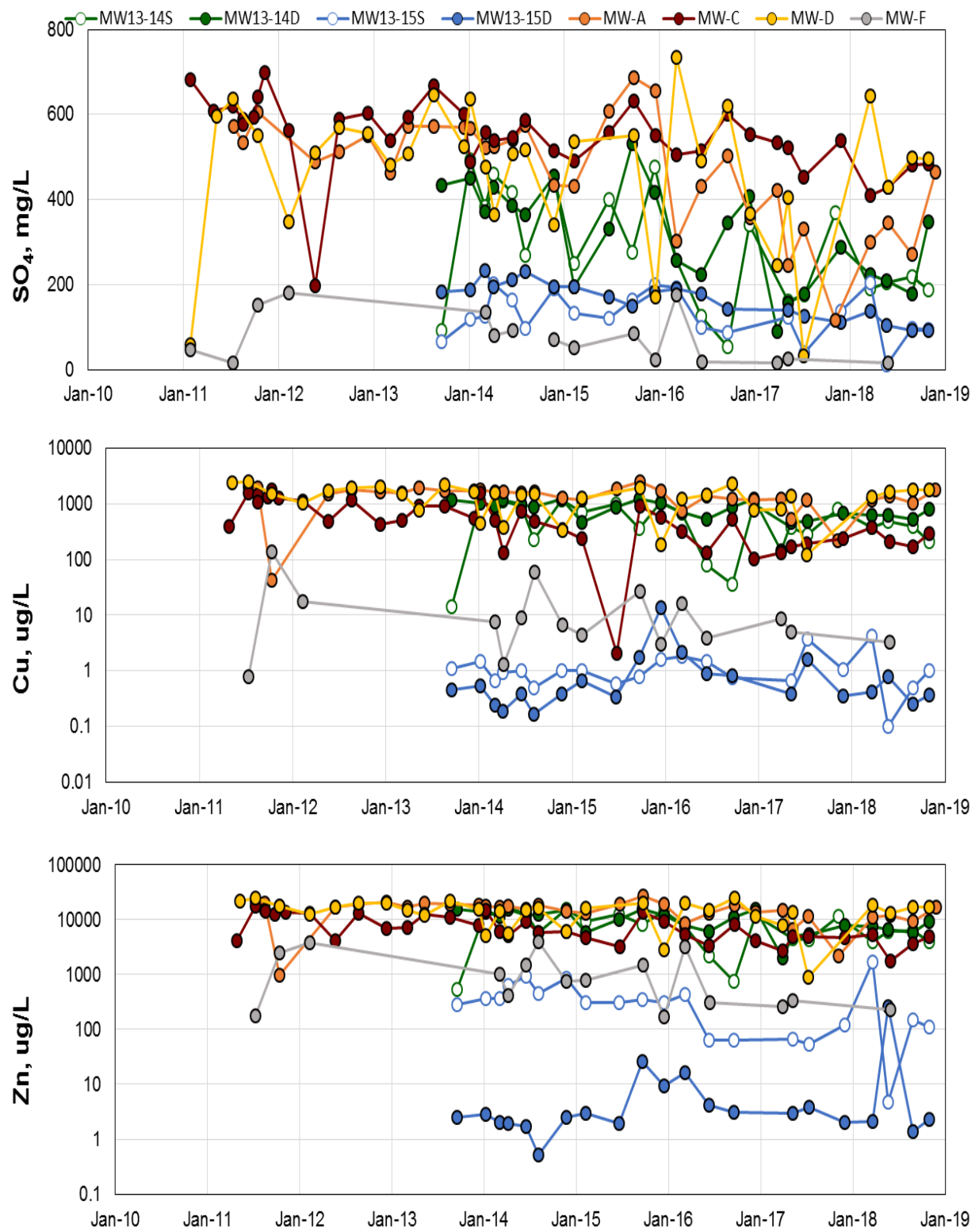


Figure 20: Old TDF Outer Drain Wells A

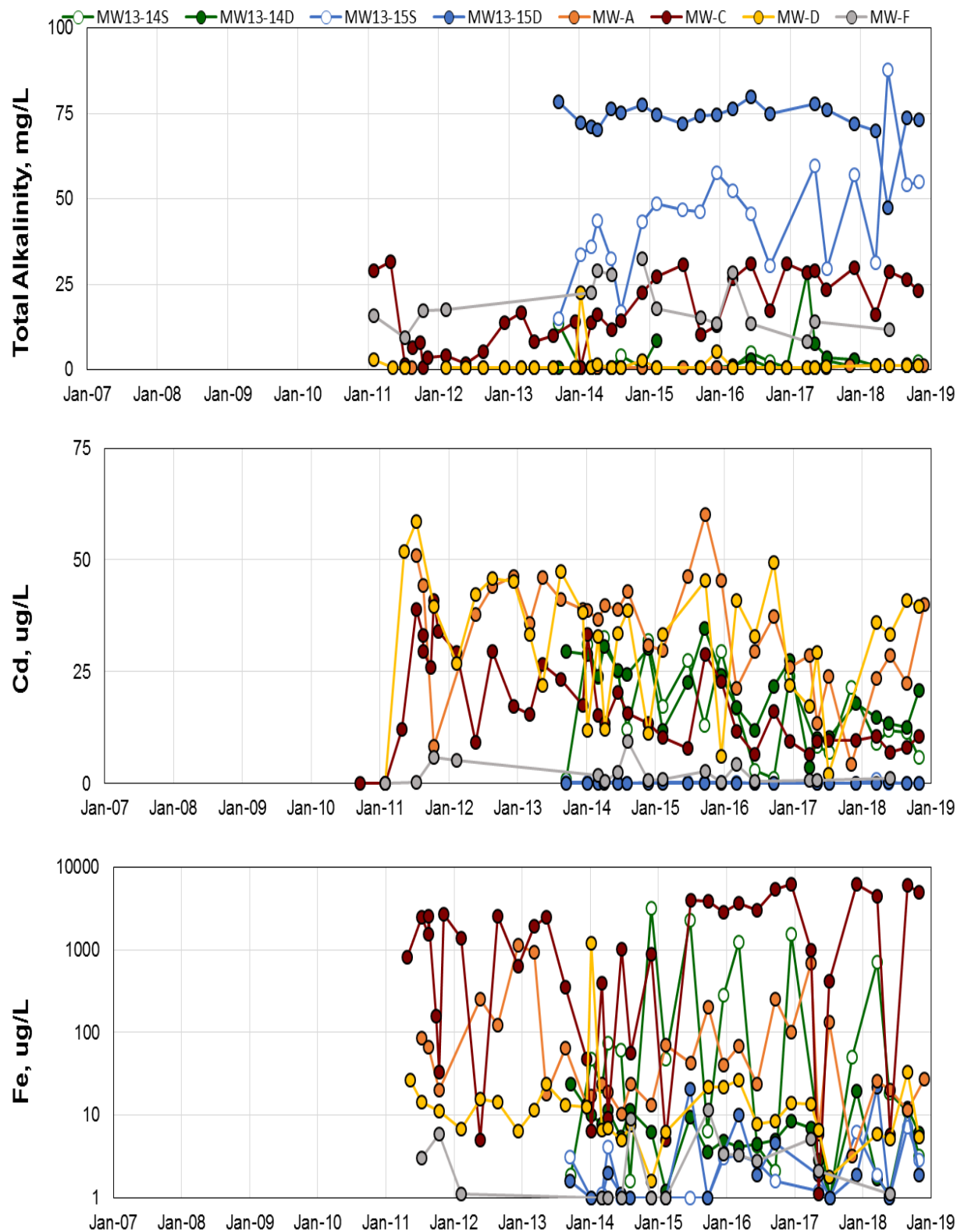


Figure 21: Old TDF Outer Drain Wells B



Dissolved copper, cadmium and sulphate were slightly lower than previous averages for this reach in each season. Dissolved zinc was slightly higher than previous year's average concentrations in the winter sampling season, but lower than average in the other sampling seasons. Alkalinity was slightly below average concentration in the winter season, and slightly above average in all other sampling events. Dissolved iron was below previous seasonal averages in the spring sampling season, and slightly above average during other sampling events. Annual results for these wells have been highly variable and the results as discussed here are considered consistent with previous years.

The Superpond and Superpond South areas are represented by five wells each. Four wells were sampled in the Superpond group. These samples indicate a general reduction relative to 2017 concentrations in the area for all parameters of concern except alkalinity which remains in the normal range for the area but has increased or stayed the same. Overall the water quality in the wells is consistent with the historical monitoring results for the long-term wells, and is decreasing in the Lynx Seepage Interception System (Lynx SIS) pumping wells. The Superpond South group consists of two drilled groundwater wells and three standpipes that were installed in test pits in 2016 as part of the Lynx Shallow Seepage Interception System investigation. The longer-term wells show consistent water quality relative to previous years, whereas the three standpipes are very shallow and have highly variable water quality over the timeframe they have been sampled.

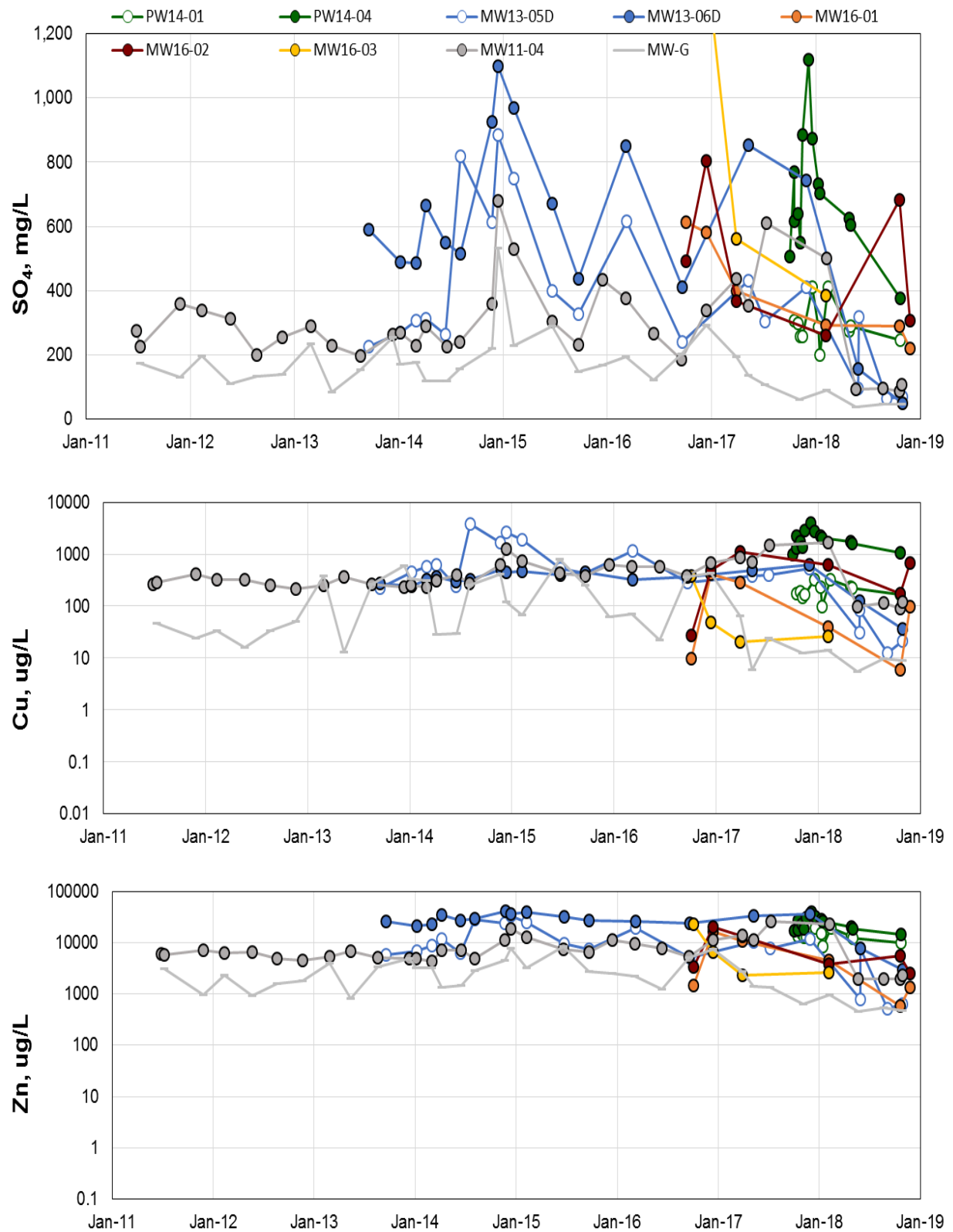


Figure 22: Superpond Area Wells A

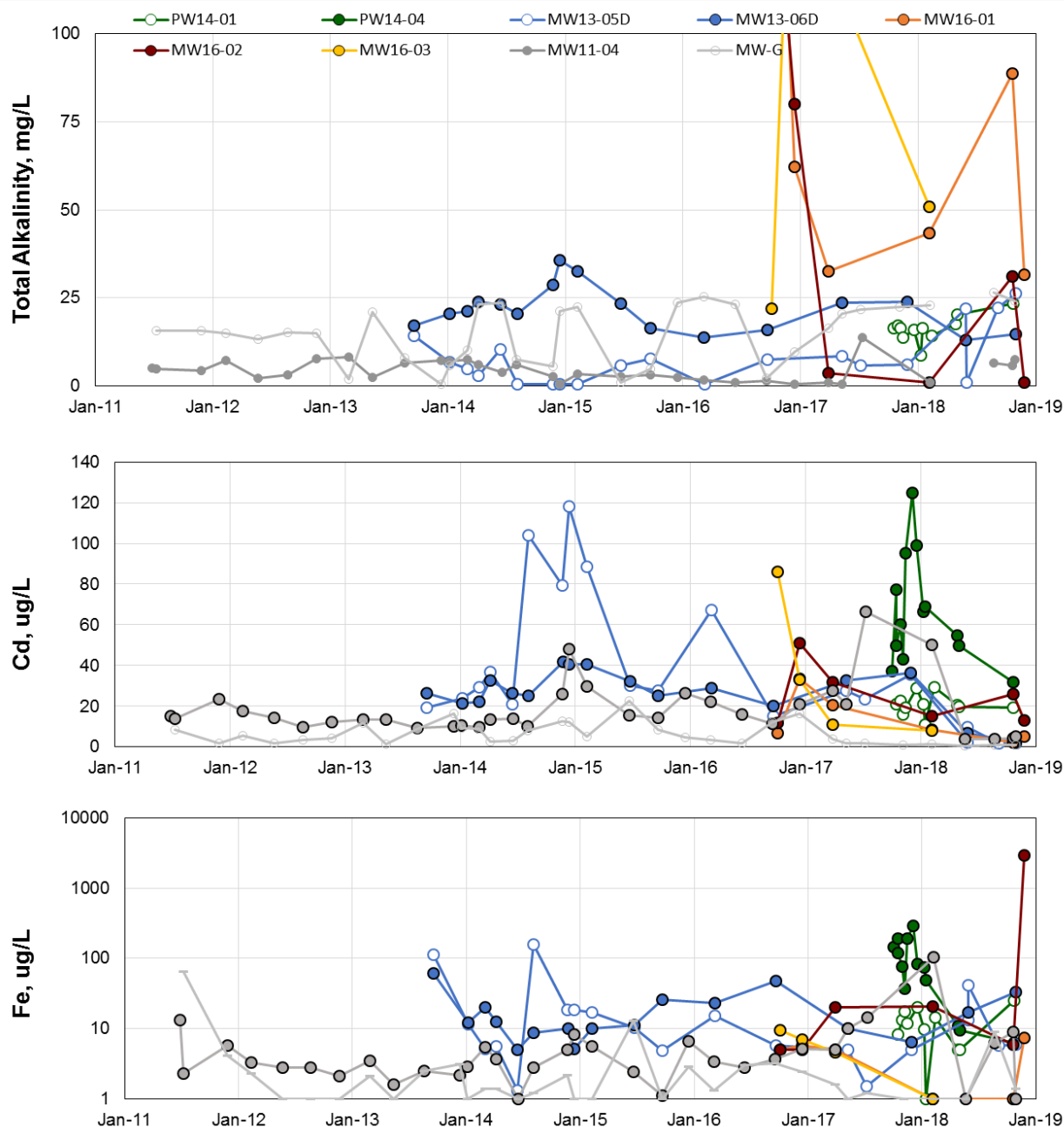


Figure 23: Superpond Area Wells B

The Lynx SSIS represents a subset of existing wells and newly installed monitoring and pumping wells and consists of four pumping wells, three drilled monitoring wells, and two standpipes installed into test pits in 2016. Of the monitoring wells, only one has monitoring data for more than two years, MW13-19. This well shows concentrations within typical range for this well. The standpipes are very shallow and have highly variable concentrations for all parameters of concern, fluctuating dramatically with precipitation and melt. The remaining wells in this area were installed in May of 2018.



The pumping wells were operated for a test period, and the results are discussed in detail in Robertson GeoConsultants report (Nyrstar Myra Falls - Phase II Lynx SIS Conceptual Design Update, 2018).

The Downstream Well cluster consists of 16 wells installed in 2013 (5) and 2017 (11). Wells installed in 2017 are fairly new and sufficient data to do comparative analyses have not been collected. These wells will continue to be monitored to develop trend data and to confirm the site-wide geochemical model.

The groundwater concentrations measured in these wells are relatively similar to previous years' average concentrations by season, fluctuating with precipitation and flow rates in Myra Creek. Based on the concentrations measured, it is concluded that the concentrations in these wells are within normal range for the area. This area is expected to see reductions in concentrations over time based on the geochemical model as updated by Robertson GeoConsultants in 2018 (Robertson GeoConsultants, 2018).

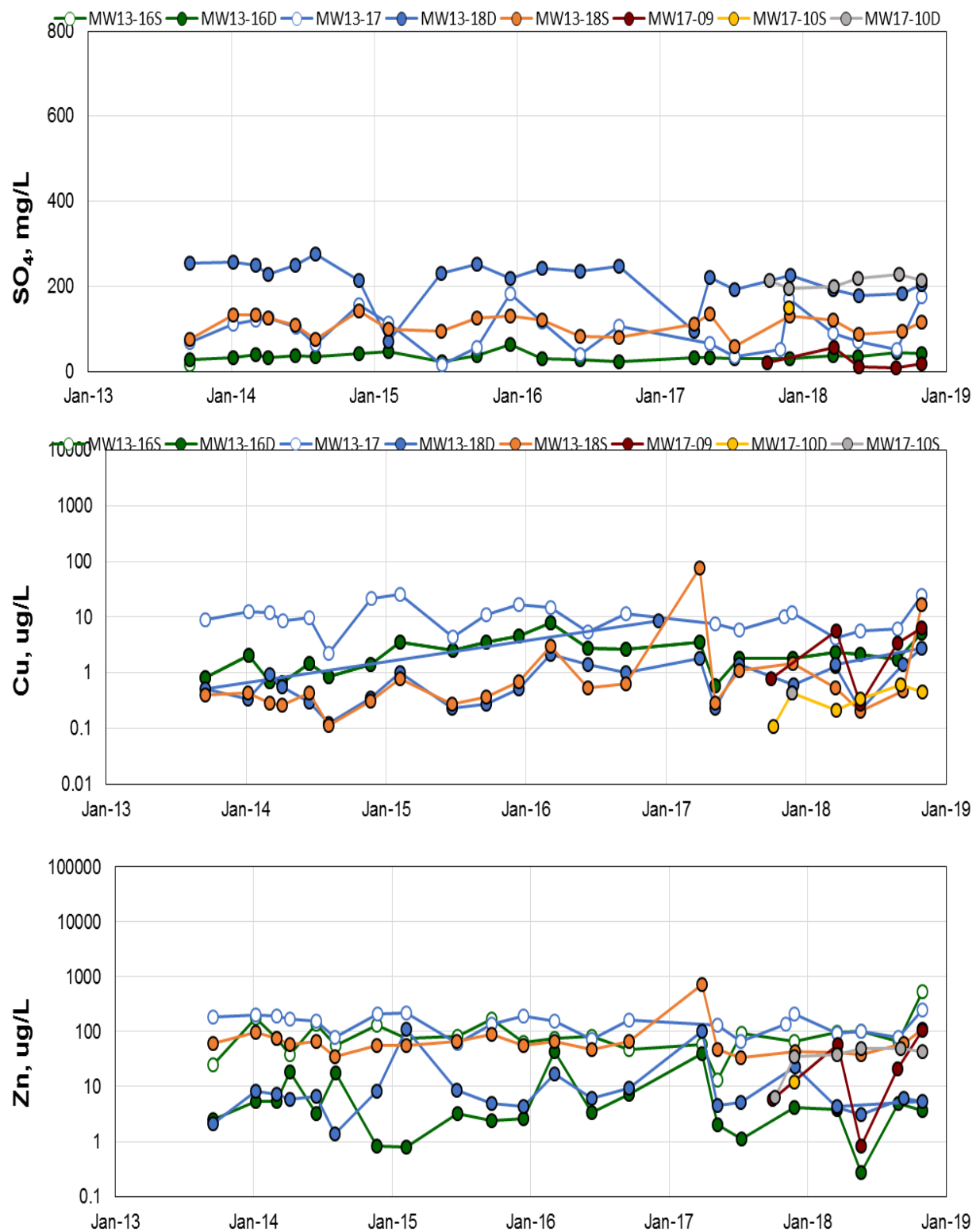


Figure 24: Downstream Wells A

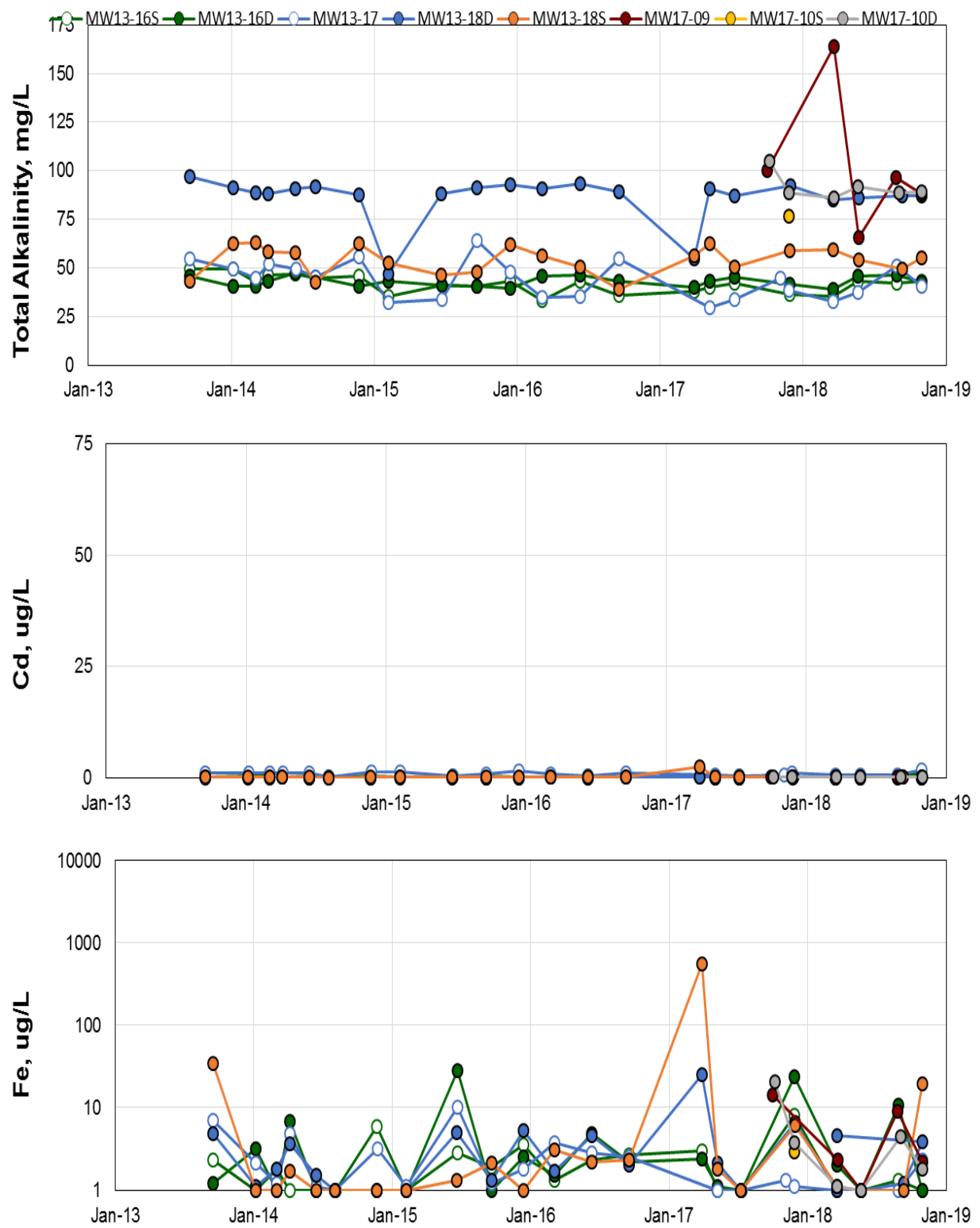


Figure 25: Downstream Wells B



Quality Assurance / Quality Control

Myra Falls utilizes a number of methods to assess data quality. To ensure integrity in water quality data, quality control (QC) samples are taken. In 2018, QC sampling was performed on daily and weekly composites as well as monthly and weekly grab samples for permit required sites and utilized the following controls for comparison of totals metals concentrations. All duplicate and blank sampling data is included in Appendix G.

Field and Trip Blanks

Field blanks are used to identify potential contamination arising from sample handling and/or sampling equipment (e.g., filtration apparatus), or from general conditions during sampling (e.g., airborne particulates). Field blanks are prepared by obtaining analyte-free water from an outside laboratory, breaking the seal of the blank in the field and mirroring the sampling method, handling, preservation, storage, and shipment of regulatory samples.

The Trip-blanks consist of a bottle of de-ionized water provided by the third-party laboratory, with the original laboratory seal remaining intact. The bottle is carried with the samples and subjected to all conditions the field samples are during the monitoring event. The seal is not removed until it is returned to the third-party laboratory for analysis. Presence of positive results in the trip blank suggests that there is a possibility of cross contamination at the third party lab, or that the water provided was not metals free.

Positive results were found in all blanks collected in 2018. All blanks used Lab sealed deionized water, as Myra Falls did not have an internal source of producing deionized water.

Field blanks were prepared using the same methods; including bottles, preservatives and filtration apparatus used on samples as collected in the field.

The presence of positive results in the field blanks suggest that there potentially is contaminant being introduced during the sample preparation, that the bottles provided by the laboratory are introducing contaminant, or that there is potential cross contamination occurring at the third party lab.

The positive Trip-blank results suggest that the laboratory provided de-ionized water is either not completely metal free upon arrival at the site, or that there is some potential introduction of contaminants at the third-party laboratory in their filtration, sample preparation and analyses circuits.



It is plausible, based on the QA/QC results over the recent months, that there is contamination being introduced at the third party laboratory. Nyrstar has started to send samples to another third party laboratory to determine if these issues can be resolved more conclusively.

Field Duplicates

Duplicate sampling is used to evaluate homogeneity of the sample stream and consistency of the sampling process. Duplicate samples are compared to determine the relative percent difference (RPD) between the samples. If the RPD is above twenty percent (20%), and the analyte concentrations is more than twice the detection limit for the method the analyte is flagged as not meeting the QA / QC standard expected.

One (1) duplicate was taken in January at MC-TP4 for dissolved and total metals. All analytes were within the acceptable range for QA/QC.

A duplicate sample was taken at Gold River Bridge on February 28th. The sample was taken with a Kemmerer water sampler off the edge of the bridge, as access to the edge of the water on foot was unsafe at this time. All samples for dissolved metals were below 20% RPD except for Nickel, which had an RPD of 40%. 14 of the total metals analyzed were outside of 20% RPD. This result indicates that suspended solids in the water sample may not have been well mixed in the sampler prior to filling the bottles, resulting in non-homogenous samples.

One (1) duplicate sample was collected at MP-EFF (Myra Ponds) on March 14th. All concentrations for dissolved metals were below 20% RPD except for dissolved lead (25% RPD) and dissolved nickel (146% RPD). Nickel concentrations were less than twice the method detection limit, and the results are within typical instrument error. It is unknown why dissolved lead is outside the acceptable limit of 20% RPD. Total nickel was over 20% RPD for total metals (63%).

On April 4th, a duplicate sample was taken at MP-EFF (Myra Ponds). Total and dissolved nickel were above acceptable limits (25% and 31% RPD respectively); dissolved nickel concentrations were less than twice the method detection limit, and the results are within typical instrument error.

A duplicate sample was taken at MP-EFF (Myra Ponds) on May 2nd. All samples for total metals were below 20% RPD except for total Thallium (26% RPD). Dissolved iron (57%RPD) and dissolved arsenic (23% RPD) were over the acceptable limit of 20% RPD. Dissolved iron was below twice the detection limit and the results are within



typical instrument error; it is unknown why total thallium and dissolved arsenic are above the acceptable limit.

June 6th, a duplicate sample was taken at MC-TP4. All concentrations of dissolved metals were below 20% RPD except cobalt and copper. Cobalt (46% RPD) was below twice the detection limit. 5 analytes of total metals were above 20% RPD. It is unknown why this occurred. It was noted on the Laboratory report that many of the dissolved metals were higher than the corresponding total metals concentrations. This is thought to be caused from possible contamination in the on-site lab due to remediation work being performed by contractors, or perhaps from contamination in the third party lab. Myra Falls plans additional investigation on our supply of DI water, as well as the third party lab.

Duplicate samples were taken at MP-EFF on July 11th and from MC-TP4 on September 5th. All total metal parameters were below 20% RPD for both duplicates.

The July duplicate had two dissolved metals that were above 20% relative percent difference (RPD), boron and lead. Boron results were within twice the detection limit, and the relatively high RPD was ruled out as a concern. The specific source of the difference in lead concentrations is not definitively known; lead is one of several repeat contaminants noted in the results of field and travel blanks analyzed in the third-party laboratory.

The September duplicate had 3 dissolved metals that were above 20% RPD, copper, iron, and lead. Iron results were within twice the detection limit. There is no definitive cause for the difference in copper and lead results; both lead and copper have shown positive results in travel and field blanks at the third party laboratory.

Several duplicate samples were taken during the fourth quarter, including 2 monthly duplicates at Myra Ponds Effluent, 1 weekly duplicate at Myra Ponds Effluent, 1 Buttle lake duplicate at Henshaw 10 m depth, 4 daily composite duplicates at Myra Ponds Effluent, and 1 daily composite duplicate at MC TP4.

The duplicate at Buttle Lake, taken at the Henshaw sample site at a depth of 10 m, showed results with over 20% relative percent difference (RPD) between the samples in dissolved antimony, cadmium, molybdenum, and nickel, as well as total barium, cobalt, iron, lead, and nickel. Dissolved antimony and nickel, as well as total cobalt nickel, and lead were within twice the detection limit and ruled out as a concern. Total lead has been identified as a concern as it has appeared in travel and field blanks in the past.



The cause of the discrepancy between samples is not definitively known for dissolved cadmium or total barium, iron, and nickel.

Duplicate samples were taken at MP-EFF on October 10th, October 24th and on December 12th. On October 10th, there were no parameters with more than 20% RPD. On October 24th, total suspended solids and total antimony had greater than 20% relative percent difference, though antimony results were within twice detection limit. On December 12th, dissolved iron had greater than 20% RPD though results were within twice the detection limit.

Daily duplicates were taken at Myra Ponds Effluent on October 15th, 20th, November 4th, and December 15th. On October 15th, three dissolved metals, iron, lead and vanadium, and one total metal, chromium had greater than 20% RPD. Dissolved iron, lead and total chromium were within twice the detection limit and ruled out as concern. On October 20th, three dissolved (iron, lead and uranium) and 1 total metal (chromium) had greater than 20% RPD. Dissolved iron and total chromium were within twice the detection limit and ruled out as a concern. It is not definitively known the cause of the discrepancy between samples in dissolved lead and uranium. On November 4th, total chromium had greater than 20% RPD, though it was within twice the detection limit and ruled out as a concern. On December 15th, two total metals, boron and iron, had greater than 20% RPD. The cause is not definitively known. As this sample was analyzed at a different third party lab, these two metals will be monitored to determine if these metals continue to differ between duplicate samples. A daily duplicate was taken at MC TP4 on December 14th. No parameters had greater than 20% RPD. Dissolved lead has been identified as present in trip and field blanks, which suggests that lab introduced contamination is possible.

Nyrstar has started using a different third party laboratory than it had in the past. The QC results from this lab will be followed during the upcoming quarters to ensure accurate and precise results. If cross contamination in the lab is suspected, a QA/QC test will be performed in the future.

Events Outside of Normal Operational Parameters

There were fifteen (15) environmental events communicated to regulatory authorities in 2018, as detailed in Table 25, fourteen (14) of which were in relation to PE-06858. Follow-up reports detailing the root cause and mitigation efforts were submitted to the Ministry of Environment and Environment Canada as required. Other agencies such as Environment Canada, the Ministry of Energy, Mines and Petroleum Resources, the Vancouver Island Health Authority and BC Parks are also notified of these events.

Table 30: Summary of Events Outside Normal Operational Parameters in 2018

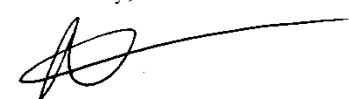
Incident Date	Incident Description	Permit or Regulation Limit Exceeded	Cause of Incident
Jan 12	Exceeded permit limit	MDMER	At approx. 6:00 PM a site wide power outage occurred; once power was restored issues with the controller regulating the CO ₂ output occurred resulting in lower CO ₂ injection than required. Highest pH reading occurred at 6:12 PM at a 9.94 at Myra out and the lowest pH reading occurred at 6:27 PM at 6.67. The swings occurred over an approx. time of about 20-25 mins. Upper pH limit for Metal Mine Effluent is 9.5, so the water exceeded the effluent limits.
Jan 21	Bypass of Treatment Works	PE-06858, MDMER	Heavy snow and rain on Saturday January 20th - Sunday January 21st led to a rapid rise of the Superpond level and 25 Sump. The 25 Sump flowed over and reported to Myra Creek for a period of approximately 2 hours. Toxicity samples taken from the spilled material were non-toxic. Final report was submitted as required to regulators.
Feb 6	Un-authorized Discharge	PE-06858	Newly identified seepage system near 25 sump was identified. Testing indicates localized areas of high zinc, cadmium and potential acute toxicity effects. A series of dewatering wells were installed in the area to attempt to mitigate the seepage. Follow up results and reports were reported to the BC Ministry of Environment and Climate Change Strategy in July.
Feb 13	Exceeded permit limit	PE-06858	Sample taken at sample site Myra STP (Camp/Mill sewage treatment plant) exceeded the PE-06858 permit limit for BOD of 45mg/L. The sample had a laboratory reported value of 65.5 mg/L. This water is discharged into the Superpond for treatment. Samples taken from MP-EFF on this day did not exceed permit limits.
March 20	Exceeded permit limit	PE-06858	Samples collected for the sewage treatment system (Myra System) under the permit PE-06858 were over limits in February and March for Biological Oxygen Demand (BOD). The system discharges into the Lime Addition Water Treatment System, is treated with the rest of the site effluent and discharged to Myra Creek from there. The sample collected on the same days from the effluent was less than detection limit for BOD. Environmental impacts as a result of this exceedance are not expected as a result for this reason. Myra STP 78.6 mg/L BOD (Permit limit 45 mg/L)
March 28	Regulatory sample missed	PE-06858	Equipment failure at sampling hut resulted in missed regulatory sample Electrical or pump failure of liberty pump resulted in water not being pumped from Myra Creek to Autosampler. Autosampler remained functional and program continued to run, however no water was available to sample as the pump had failed.
April 11	Bypass of Treatment Works	PE-06858, MDMER	A pump failure at the HW Run-off Sump, resulted in the release of approximately 36 m ³ of water into Webster Creek. This sump collects storm run-off from the parking lots and roadways around the HW complex, including the Headframe, offices, shop and warehouse yards. pH was 7.2, electrical conductivity was 68µS/cm.
April 25	Exceeded permit limit	PE-06858	Samples collected for the sewage treatment system (Myra System) under the permit PE-06858 were over limits in April for Biological Oxygen Demand (BOD). The system discharges into the Lime Addition Water Treatment System, is treated with the rest of the site effluent and discharged to Myra Creek from there. The sample collected on the same days from the effluent was less than detection limit for BOD. Environmental impacts as a result of this exceedance are not expected as a result for this reason. Myra STP 82.0 mg/L BOD (Permit limit 45 mg/L)
May 16 – 23	Regulatory data lost	PE-06858	Site historian was down and data was lost for the month of May. All data was retrieved except for May 16th to 23rd. Flow data was estimated for these days; however there is no continuous pH data for these days. It is not expected that the effluent was out of compliance; however there is no data to support this, as was reported June 29, 2018.
June 6	Exceeded permit limit	PE-06858	Samples collected at the Myra STP for Biological Oxygen Demand (BOD) measured 91.7 mg/L, exceeding the permit limit of 45mg/L.
Aug 17	Regulatory sample missed	PE-06858	During Buttle Lake sampling in August, two samples were missed due to sampler error interpreting amended permit. EMS# 0130082 at depth 100 m and EMS# 0130090 at depth 10 m were not sampled. This error was noted on October 4th 2018 and reported to the Ministry of Environmental and Climate Change Strategy via the Non-Compliance email address on that date.



Incident Date	Incident Description	Permit or Regulation Limit Exceeded	Cause of Incident
Sept 10	Bypass of Treatment Works	PE-06858, MDMER	A surface water sump that collects road and parking lot runoff (HW-SUMP) overtopped into Webster Creek, which then conveys into Myra Creek. Due to periods of heavy rainfall, the sump became overwhelmed before the backup pump could be initiated. Total volume released estimated as 3000-6000 L. Two larger capacity pumps were installed to replace the existing primary pump in order to prevent future overtopping. DGIR number for this event is 182116, and the final report was submitted October 9th 2018
Oct 23	Regulatory sample missed	PE-06858	While collecting daily sample at sample site MC-TP4 it was noted that the autosampler did not collect enough water for the daily composite sample. This malfunction was noted on October 24th 2018 and reported to the Ministry of Environmental and Climate Change Strategy via the Non-Compliance email address on that date. The sampler was replaced with a functioning unit while testing and maintenance was conducted on the malfunctioning sampler.
Dec 6	Regulatory sample missed	PE-06858	During a routine check on the autosampler at sample site MC-TP4 it was noted that the hose that delivers water to the sampler had become detached and therefore did not deliver water to the sampler, resulting in loss of a daily composite sample for December 6th. The issue was corrected at time of discovery and no further loss of sample has been observed since that date. A final report detailing most likely cause and actions planned and taken to prevent future occurrence was submitted on January 4th 2019.
Dec 20	Exceeded permit limit	PE-06858	A sample taken in response to visible turbidity at Myra Ponds Effluent was taken at 8:00 AM. Upon receipt of results it was noted to be in excess of the total suspended solids (TSS) limit for flows less than 110,000 m ³ /day (25 mg/L limit). The sample had TSS measured at 27 mg/L. Toxicity samples were taken at the same time and found to be non-toxic at the site of the sample, as well as 50 m downstream in Myra Creek. This exceedance was discovered upon receipt of laboratory results on January 9th and reported on January 10th. An update including all relevant laboratory data was submitted on January 11th submitting laboratory results. A final report was submitted on February 8 th , 2019.

Closure

This Annual Effluent Permit Report was prepared on behalf of Nyrstar Myra Falls Ltd. Should you have any questions or require additional information, please contact Nicole Pesonen at (250) 287-9271 Ext. 3316, or email nicole.pesonen@nyrstar.com

Sincerely,

Nicole Pesonen
Environmental Advisor
Nyrstar Myra Falls



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Appendix A
Creek Stage and Flow Data

Myra Creek Flow (based on creek stage) for 2018

Date	Average Creek Height (m)	Max Creek Height (m)	Min Creek Height (m)	Bridge to Surface (m) avg	Bridge to Surface (m) max	Bridge to Surface (m) min	Myra Ck at Bridge m ³ /s avg	Myra Ck at Bridge m ³ /s max	Myra Ck at Bridge m ³ /s min	Myra Pond Outflow m ³ /day	Myra Pond Outflow m ³ /s	Myra Creek Total m ³ /s	Myra Creek Total m ³ /day
01/01/2018	0.67	0.69	0.66	7.06	7.04	7.07	7.78	7.92	7.67	20483.01	0.24	8.01	712,919
02/01/2018	0.67	0.69	0.66	7.06	7.04	7.07	7.78	7.93	7.64	20920.32	0.24	8.02	713,906
03/01/2018	0.68	0.69	0.67	7.05	7.04	7.06	7.85	7.96	7.76	20236.99	0.23	8.08	718,568
04/01/2018	0.71	0.78	0.67	7.02	6.95	7.06	8.09	8.79	7.75	18681.58	0.22	8.31	736,575
05/01/2018	1.18	1.65	0.78	6.55	6.08	6.95	12.65	17.15	8.83	29959.62	0.35	12.99	1,152,484
06/01/2018	1.30	1.57	1.13	6.43	6.16	6.60	13.83	16.39	12.17	28700.86	0.33	14.17	1,252,592
07/01/2018	1.07	1.13	1.05	6.66	6.60	6.68	11.63	12.17	11.41	27752.76	0.32	11.96	1,060,732
08/01/2018	1.11	1.14	1.07	6.62	6.59	6.66	12.02	12.25	11.58	31039.29	0.36	12.38	1,100,922
09/01/2018	1.07	1.13	1.02	6.66	6.61	6.71	11.56	12.12	11.07	28471.98	0.33	11.89	1,055,666
10/01/2018	0.98	1.02	0.95	6.75	6.71	6.78	10.75	11.12	10.43	26405.52	0.31	11.06	981,848
11/01/2018	0.93	0.95	0.91	6.80	6.78	6.83	10.25	10.47	10.00	27164.70	0.31	10.57	940,170
12/01/2018	0.89	0.91	0.85	6.84	6.82	6.88	9.86	10.04	9.49	25662.63	0.30	10.16	903,393
13/01/2018	0.94	0.98	0.91	6.79	6.75	6.82	10.34	10.76	10.04	23529.01	0.27	10.62	940,746
14/01/2018	1.03	1.12	0.97	6.70	6.61	6.76	11.23	12.05	10.62	23125.08	0.27	11.49	1,016,145
15/01/2018	1.19	1.36	1.12	6.54	6.37	6.61	12.70	14.40	12.07	28051.45	0.32	13.02	1,153,353
16/01/2018	1.81	2.03	1.38	5.92	5.70	6.35	18.73	20.84	14.59	43286.84	0.50	19.23	1,704,420
17/01/2018	1.87	2.41	1.50	5.86	5.32	6.23	19.33	24.51	15.69	73839.72	0.85	20.19	1,818,025
18/01/2018	1.95	2.27	1.66	5.78	5.46	6.07	20.02	23.17	17.30	83635.37	0.97	20.98	1,896,725
19/01/2018	1.52	1.67	1.42	6.21	6.06	6.31	15.88	17.34	14.95	64347.76	0.74	16.63	1,501,073
20/01/2018	1.34	1.43	1.26	6.39	6.30	6.47	14.24	15.03	13.40	61217.84	0.71	14.95	1,352,516
21/01/2018	1.91	2.39	1.31	5.82	5.34	6.42	19.69	24.27	13.88	99885.51	1.16	20.85	1,901,048
22/01/2018	1.50	1.71	1.36	6.25	6.02	6.37	15.69	17.77	14.40	64437.02	0.75	16.43	1,484,300
23/01/2018	1.30	1.37	1.25	6.43	6.36	6.48	13.80	14.44	13.33	59976.26	0.69	14.49	1,312,328
24/01/2018	1.23	1.26	1.20	6.50	6.47	6.53	13.17	13.40	12.84	50782.62	0.59	13.76	1,239,821
25/01/2018	1.14	1.21	1.11	6.59	6.52	6.62	12.31	12.90	11.95	44183.30	0.51	12.82	1,152,174
26/01/2018	1.07	1.11	1.05	6.66	6.62	6.69	11.61	12.00	11.35	39433.25	0.46	12.06	1,081,772
27/01/2018	1.01	1.05	0.99	6.72	6.68	6.74	11.04	11.36	10.84	37115.75	0.43	11.47	1,028,085
28/01/2018	1.36	2.56	0.97	6.37	5.17	6.76	14.39	25.92	10.63	64397.33	0.75	15.14	1,372,370
29/01/2018	2.41	2.64	2.01	5.32	5.09	5.72	24.47	26.72	20.62	80152.77	0.93	25.40	2,274,615
30/01/2018	1.67	2.00	1.46	6.06	5.73	6.27	17.39	20.58	15.33	58274.51	0.67	18.07	1,619,452
31/01/2018	1.36	1.46	1.27	6.37	6.27	6.46	14.35	15.33	13.54	45058.97	0.52	14.87	1,330,064
01/02/2018	1.22	1.28	1.18	6.51	6.46	6.56	13.08	13.57	12.60	41211.84	0.48	13.56	1,212,598
02/02/2018	1.22	1.33	1.16	6.51	6.40	6.57	13.01	14.09	12.48	42991.77	0.50	13.51	1,209,861
03/02/2018	1.40	1.57	1.32	6.33	6.16	6.41	14.76	16.43	14.02	48155.53	0.56	15.31	1,371,208
04/02/2018	1.97	2.16	1.58	5.76	5.58	6.15	20.30	22.03	16.53	58305.31	0.67	20.98	1,870,552
05/02/2018	1.68	1.90	1.50	6.05	5.83	6.23	17.42	19.61	15.69	50672.44	0.59	18.00	1,606,050
06/02/2018	1.41	1.50	1.36	6.32	6.23	6.37	14.89	15.71	14.38	50649.88	0.59	15.48	1,387,890
07/02/2018	1.47	1.81	1.36	6.26	5.93	6.37	15.39	18.67	14.34	49389.85	0.57	15.97	1,428,896
08/02/2018	1.81	2.00	1.56	5.92	5.73	6.17	18.75	20.55	16.34	52806.16	0.61	19.36	1,725,797
09/02/2018	1.42	1.56	1.32	6.31	6.17	6.41	14.96	16.35	13.96	43648.42	0.51	15.46	1,379,483
10/02/2018	1.23	1.32	1.18	6.50	6.41	6.55	13.12	13.99	12.62	34563.92	0.40	13.52	1,203,079
11/02/2018	1.13	1.19	1.08	6.60	6.55	6.65	12.21	12.70	11.69	34594.08	0.40	12.61	1,123,822
12/02/2018	1.04	1.08	1.01	6.69	6.65	6.72	11.27	11.69	11.01	32601.01	0.38	11.65	1,038,778
13/02/2018	1.02	1.04	1.00	6.71	6.69	6.73	11.11	11.34	10.94	34187.89	0.40	11.50	1,027,980
14/02/2018	0.97	1.01	0.94	6.76	6.72	6.79	10.67	11.01	10.37	30217.67	0.35	11.02	981,954
15/02/2018	0.93	0.95	0.90	6.80	6.78	6.83	10.20	10.43	9.96	26452.96	0.31	10.50	934,060
16/02/2018	0.91	0.93	0.89	6.82	6.80	6.84	10.05	10.23	9.88	31420.51	0.36	10.41	930,829
17/02/2018	0.89	0.91	0.87	6.84	6.82	6.86	9.89	10.08	9.65	33274.85	0.39	10.27	920,765
18/02/2018	0.84	0.89	0.79	6.89	6.84	6.94	9.42	9.87	8.93	23272.18	0.27	9.69	860,829
19/02/2018	0.79	0.83	0.75	6.94	6.90	6.98	8.89	9.25	8.53	23221.42	0.27	9.15	814,204
20/02/2018	0.79	0.81	0.77	6.94	6.92	6.96	8.89	9.08	8.68	22056.08	0.26	9.14	811,830
21/02/2018	0.75	0.78	0.73	6.98	6.95	7.00	8.55	8.76	8.36	21227.39	0.25	8.79	780,827
22/02/2018	0.74	0.76	0.72	6.99	6.97	7.01	8.39	8.64	8.20	21323.99	0.25	8.64	767,603
23/02/2018	0.73	0.74	0.72	7.00	6.99	7.01	8.30	8.43	8.19	15200.66	0.18	8.47	747,361
24/02/2018	0.73	0.75	0.71	7.00	6.98	7.02	8.31	8.47	8.16	16857.95	0.20	8.51	751,819
25/02/2018	0.73	0.74	0.71	7.00	6.99	7.02	8.29	8.40	8.17	23098.54	0.27	8.56	762,282
26/02/2018	0.70	0.72	0.69	7.03	7.01	7.04	8.03	8.21	7.90	22151.39	0.26	8.29	738,092
27/02/2018	0.71	0.73	0.69	7.02	7.00	7.04	8.08	8.28	7.94	23671.83	0.27	8.35	745,498
28/02/2018	0.71	0.72	0.69	7.02	7.01	7.04	8.10	8.25	7.97	24410.82	0.28	8.38	748,562
01/03/2018	0.71	0.73	0.69	7.03	7.00	7.04	8.12	8.30	7.96	23033.60	0.27	8.39	747,713
02/03/2018	0.70	0.71	0.68	7.03	7.02	7.05	7.98	8.16	7.85	21134.49	0.24	8.23	732,100
03/03/2018	0.68	0.69	0.66	7.05	7.04	7.07	7.80	7.95	7.64	19326.06	0.22	8.03	712,753
04/03/2018	0.66	0.69	0.65	7.07	7.04	7.08	7.69	7.91	7.52	19866.60	0.23	7.92	703,847
05/03/2018	0.65	0.68	0.63	7.08	7.05	7.10	7.57	7.81	7.35	20511.87	0.24	7.81	695,324
06/03/2018	0.65	0.68	0.64	7.08	7.05	7.10	7.59	7.82	7.41	20977.65	0.24	7.83	697,875
07/03/2018	0.65	0.67	0.63	7.08	7.06	7.10	7.54	7.73	7.37	21327.64	0.25	7.78	693,681

08/03/2018	0.65	0.67	0.63	7.08	7.06	7.10	7.54	7.72	7.36	22179.79	0.26	7.79	695,558
09/03/2018	0.65	0.67	0.62	7.08	7.06	7.11	7.51	7.73	7.28	21157.80	0.24	7.75	690,968
10/03/2018	0.63	0.66	0.61	7.10	7.07	7.12	7.37	7.63	7.20	20940.64	0.24	7.62	679,065
11/03/2018	0.63	0.65	0.61	7.10	7.08	7.12	7.34	7.52	7.16	21048.49	0.24	7.58	675,911
12/03/2018	0.63	0.65	0.61	7.10	7.08	7.12	7.34	7.51	7.14	21368.32	0.25	7.58	676,534
13/03/2018	0.67	0.75	0.62	7.06	6.98	7.11	7.75	8.55	7.28	24169.72	0.28	8.03	717,858
14/03/2018	0.81	0.84	0.76	6.92	6.89	6.98	9.09	9.40	8.56	21412.08	0.25	9.33	827,918
15/03/2018	0.79	0.81	0.76	6.94	6.92	6.97	8.90	9.12	8.58	21239.60	0.25	9.15	811,393
16/03/2018	0.74	0.76	0.73	6.99	6.97	7.00	8.45	8.65	8.34	20560.17	0.24	8.69	771,489
17/03/2018	0.74	0.77	0.73	6.99	6.96	7.00	8.46	8.67	8.30	20699.20	0.24	8.70	772,122
18/03/2018	0.74	0.75	0.73	6.99	6.98	7.00	8.43	8.53	8.31	20699.20	0.24	8.67	769,463
19/03/2018	0.73	0.76	0.72	7.00	6.97	7.01	8.36	8.60	8.21	15892.67	0.18	8.55	754,202
20/03/2018	0.74	0.77	0.72	6.99	6.96	7.01	8.46	8.68	8.25	21595.98	0.25	8.71	774,323
21/03/2018	0.76	0.78	0.75	6.97	6.95	6.99	8.61	8.79	8.46	21944.18	0.25	8.86	787,700
22/03/2018	0.78	0.80	0.76	6.95	6.93	6.97	8.78	9.01	8.63	22091.47	0.26	9.03	802,546
23/03/2018	0.75	0.77	0.74	6.98	6.96	6.99	8.55	8.74	8.42	20992.60	0.24	8.79	780,678
24/03/2018	0.74	0.77	0.72	6.99	6.97	7.01	8.40	8.66	8.19	21320.45	0.25	8.64	768,003
25/03/2018	0.72	0.74	0.70	7.01	6.99	7.03	8.25	8.45	8.01	22685.10	0.26	8.51	758,138
26/03/2018	0.75	0.79	0.71	6.98	6.94	7.02	8.48	8.88	8.17	21903.50	0.25	8.74	776,774
27/03/2018	0.91	0.99	0.79	6.82	6.74	6.94	10.02	10.86	8.88	21548.82	0.25	10.27	908,990
28/03/2018	0.95	1.00	0.91	6.78	6.73	6.82	10.41	10.88	10.04	21549.71	0.25	10.66	942,911
29/03/2018	0.92	0.97	0.89	6.81	6.76	6.85	10.12	10.63	9.81	22557.66	0.26	10.38	919,149
30/03/2018	0.98	1.00	0.97	6.75	6.74	6.76	10.75	10.87	10.61	23962.92	0.28	11.03	976,712
31/03/2018	0.96	0.98	0.94	6.77	6.75	6.80	10.49	10.70	10.29	21956.59	0.25	10.75	950,377
01/04/2018	0.91	0.94	0.87	6.82	6.79	6.86	10.04	10.31	9.64	19479.88	0.23	10.26	906,047
02/04/2018	0.85	0.87	0.83	6.88	6.86	6.90	9.43	9.69	9.25	19157.16	0.22	9.65	853,084
03/04/2018	0.83	0.84	0.81	6.90	6.89	6.92	9.24	9.40	9.10	20218.19	0.23	9.47	838,731
04/04/2018	0.81	0.83	0.80	6.92	6.90	6.93	9.10	9.24	8.96	20875.60	0.24	9.34	827,989
05/04/2018	0.86	1.03	0.77	6.87	6.71	6.96	9.54	11.16	8.70	25342.87	0.29	9.84	875,122
06/04/2018	1.19	1.30	1.04	6.54	6.43	6.69	12.73	13.82	11.26	27268.71	0.32	13.05	1,154,724
07/04/2018	1.61	1.95	1.28	6.12	5.78	6.45	16.80	20.08	13.65	41668.52	0.48	17.28	1,534,494
08/04/2018	1.47	1.70	1.37	6.26	6.03	6.36	15.43	17.69	14.45	40039.79	0.46	15.90	1,413,401
09/04/2018	1.34	1.39	1.30	6.39	6.34	6.43	14.18	14.64	13.82	38544.99	0.45	14.62	1,301,912
10/04/2018	1.47	1.68	1.28	6.26	6.05	6.45	15.47	17.46	13.63	45168.08	0.52	15.99	1,426,663
11/04/2018	1.52	1.62	1.41	6.21	6.11	6.32	15.93	16.87	14.84	60884.71	0.70	16.64	1,498,348
12/04/2018	1.30	1.41	1.23	6.43	6.33	6.51	13.83	14.82	13.08	56229.52	0.65	14.48	1,306,956
13/04/2018	1.43	1.94	1.17	6.30	5.79	6.56	15.03	19.94	12.59	53599.55	0.62	15.65	1,405,630
14/04/2018	1.52	1.78	1.35	6.21	5.95	6.38	15.93	18.44	14.28	50649.19	0.59	16.52	1,478,024
15/04/2018	1.27	1.35	1.22	6.46	6.38	6.51	13.55	14.31	13.02	48317.81	0.56	14.11	1,267,746
16/04/2018	1.18	1.22	1.15	6.55	6.51	6.59	12.64	13.00	12.31	42639.22	0.49	13.13	1,177,470
17/04/2018	1.11	1.14	1.08	6.62	6.59	6.65	12.00	12.29	11.70	38127.87	0.44	12.44	1,112,769
18/04/2018	1.06	1.09	1.04	6.67	6.64	6.69	11.50	11.78	11.31	33812.34	0.39	11.89	1,061,141
19/04/2018	1.03	1.05	0.99	6.70	6.68	6.74	11.16	11.42	10.81	32705.51	0.38	11.54	1,029,780
20/04/2018	1.07	1.20	1.02	6.66	6.53	6.72	11.57	12.85	11.06	32825.99	0.38	11.95	1,064,954
21/04/2018	1.17	1.21	1.10	6.56	6.52	6.63	12.54	12.95	11.91	31921.91	0.37	12.91	1,147,426
22/04/2018	1.07	1.11	1.05	6.66	6.63	6.68	11.59	11.93	11.39	30848.52	0.36	11.95	1,062,957
23/04/2018	1.05	1.10	1.03	6.68	6.64	6.70	11.44	11.83	11.17	33089.24	0.38	11.83	1,054,974
24/04/2018	1.14	1.26	1.09	6.59	6.47	6.64	12.29	13.39	11.80	31477.18	0.36	12.66	1,125,046
25/04/2018	1.30	1.44	1.24	6.43	6.29	6.49	13.77	15.18	13.27	31905.34	0.37	14.14	1,253,674
26/04/2018	1.47	1.65	1.39	6.26	6.08	6.34	15.41	17.16	14.65	33655.37	0.39	15.80	1,398,605
27/04/2018	1.67	1.94	1.54	6.06	5.80	6.19	17.37	19.92	16.13	37356	0.43	17.80	1,575,147
28/04/2018	1.65	1.92	1.51	6.08	5.82	6.22	17.15	19.72	15.85	37628	0.44	17.58	1,556,738
29/04/2018	1.50	1.53	1.47	6.23	6.20	6.26	15.70	16.02	15.41	35791	0.41	16.12	1,428,204
30/04/2018	1.51	1.55	1.48	6.22	6.19	6.25	15.80	16.16	15.51	36673	0.42	16.23	1,438,561
01/05/2018	1.50	1.57	1.45	6.23	6.16	6.28	15.73	16.37	15.26	37984	0.44	16.17	1,434,660
02/05/2018	1.61	1.88	1.51	6.12	5.85	6.23	16.77	19.37	15.78	39083	0.45	17.22	1,527,227
03/05/2018	1.85	2.05	1.72	5.88	5.68	6.01	19.14	20.99	17.86	38735	0.45	19.59	1,731,332
04/05/2018	1.72	1.99	1.59	6.01	5.74	6.14	17.82	20.45	16.64	37919	0.44	18.26	1,615,190
05/05/2018	1.61	1.81	1.53	6.12	5.92	6.20	16.82	18.70	15.99	38556	0.45	17.26	1,530,183
06/05/2018	1.78	2.02	1.66	5.95	5.71	6.07	18.44	20.73	17.23	39713	0.46	18.90	1,672,664
07/05/2018	1.90	2.03	1.75	5.83	5.70	5.98	19.60	20.82	18.17	41030	0.47	20.07	1,775,204
08/05/2018	1.89	2.10	1.74	5.84	5.63	5.99	19.51	21.52	18.07	40410	0.47	19.98	1,766,281
09/05/2018	2.14	2.25	1.99	5.59	5.49	5.74	21.90	22.90	20.45	42414	0.49	22.39	1,976,935
10/05/2018	1.75	1.99	1.64	5.98	5.74	6.09	18.12	20.48	17.12	39616	0.46	18.58	1,645,020
11/05/2018	1.63	1.75	1.56	6.10	5.98	6.17	17.02	18.17	16.28	35689	0.41	17.44	1,542,336
12/05/2018	1.73	1.97	1.60	6.00	5.76	6.13	17.97	20.26	16.68	37573	0.43	18.41	1,627,838
13/05/2018	1.89	2.15	1.70	5.84	5.58	6.03	19.47	21.96	17.66	39443	0.46	19.92	1,760,882
14/05/2018	2.04	2.26	1.86	5.69	5.47	5.87	20.92	23.01	19.20	38692	0.45	21.36	1,884,561
15/05/2018	1.99	2.16	1.81	5.74	5.57	5.92	20.46	22.05	18.74	37141	0.43	20.89	1,842,368
16/05/2018	1.93	2.09	1.79	5.80	5.65	5.94	19.86	21.36	18.49	38824	0.45	20.31	1,793,763

17/05/2018	1.86	2.03	1.71	5.87	5.70	6.02	19.18	20.81	17.78	38824	0.45	19.63	1,734,533
18/05/2018	1.87	2.12	1.70	5.86	5.61	6.03	19.28	21.74	17.67	38824	0.45	19.73	1,743,151
19/05/2018	1.92	2.07	1.80	5.81	5.66	5.93	19.76	21.24	18.66	40410	0.47	20.23	1,788,178
20/05/2018	1.74	1.89	1.66	5.99	5.84	6.07	18.06	19.46	17.30	40410	0.47	18.52	1,640,961
21/05/2018	1.66	1.76	1.58	6.07	5.97	6.15	17.27	18.20	16.47	38824	0.45	17.72	1,569,758
22/05/2018	1.72	1.95	1.58	6.01	5.78	6.15	17.86	20.04	16.50	38824	0.45	18.31	1,620,491
23/05/2018	1.86	2.10	1.69	5.87	5.64	6.04	19.16	21.46	17.55	38824	0.45	19.61	1,733,242
24/05/2018	1.88	2.03	1.74	5.85	5.70	5.99	19.43	20.87	18.06	39739	0.46	19.89	1,758,139
25/05/2018	1.63	1.94	1.50	6.10	5.79	6.23	17.00	19.96	15.75	38935	0.45	17.45	1,546,801
26/05/2018	1.43	1.50	1.39	6.30	6.23	6.34	15.03	15.74	14.71	38948	0.45	15.49	1,376,916
27/05/2018	1.43	1.54	1.37	6.30	6.19	6.36	15.05	16.13	14.44	39860	0.46	15.51	1,380,126
28/05/2018	1.52	1.64	1.45	6.21	6.09	6.28	15.96	17.04	15.26	41295	0.48	16.43	1,461,265
29/05/2018	1.46	1.61	1.39	6.27	6.12	6.34	15.36	16.77	14.69	39977	0.46	15.83	1,407,428
30/05/2018	1.35	1.41	1.31	6.38	6.32	6.42	14.27	14.89	13.92	33972	0.39	14.66	1,300,909
31/05/2018	1.37	1.41	1.33	6.36	6.32	6.41	14.51	14.85	14.05	36222	0.42	14.92	1,325,677
01/06/2018	1.34	1.40	1.30	6.39	6.33	6.43	14.17	14.79	13.82	34481	0.40	14.57	1,292,954
02/06/2018	1.53	1.61	1.42	6.20	6.12	6.31	16.04	16.83	14.93	37990	0.44	16.48	1,461,445
03/06/2018	1.44	1.58	1.37	6.29	6.15	6.36	15.14	16.51	14.46	34435	0.40	15.54	1,376,976
04/06/2018	1.33	1.39	1.31	6.40	6.35	6.42	14.11	14.62	13.87	39391	0.46	14.56	1,297,524
05/06/2018	1.35	1.58	1.26	6.38	6.15	6.47	14.29	16.54	13.39	38489	0.45	14.74	1,311,597
06/06/2018	1.61	1.65	1.56	6.12	6.08	6.17	16.77	17.21	16.29	33279	0.39	17.16	1,515,835
07/06/2018	1.56	1.98	1.43	6.17	5.75	6.30	16.30	20.33	15.07	35761	0.41	16.72	1,480,114
08/06/2018	2.38	2.88	1.98	5.55	4.85	5.75	24.24	29.05	20.39	43562	0.50	24.74	2,181,095
09/06/2018	1.70	2.01	1.55	6.03	5.72	6.19	17.65	20.66	16.16	44358	0.51	18.16	1,613,377
10/06/2018	1.47	1.56	1.43	6.26	6.17	6.30	15.46	16.29	15.04	40504	0.47	15.93	1,416,693
11/06/2018	1.38	1.43	1.34	6.35	6.31	6.39	14.60	15.01	14.20	40957	0.47	15.07	1,343,403
12/06/2018	1.35	1.40	1.32	6.38	6.33	6.41	14.26	14.77	14.01	40607	0.47	14.73	1,313,045
13/06/2018	1.47	1.57	1.36	6.26	6.16	6.37	15.47	16.44	14.41	42773	0.50	15.97	1,422,263
14/06/2018	1.47	1.57	1.41	6.26	6.16	6.32	15.41	16.43	14.89	36202	0.42	15.83	1,404,002
15/06/2018	1.44	1.55	1.37	6.29	6.18	6.36	15.18	16.19	14.51	24688	0.29	15.47	1,361,155
16/06/2018	1.52	1.64	1.42	6.21	6.09	6.31	15.91	17.11	15.00	38262	0.44	16.35	1,451,067
17/06/2018	1.58	1.73	1.46	6.15	6.00	6.27	16.46	17.92	15.38	40443	0.47	16.92	1,502,602
18/06/2018	1.65	1.83	1.51	6.08	5.90	6.22	17.16	18.92	15.87	37770	0.44	17.60	1,558,001
19/06/2018	1.72	1.90	1.59	6.01	5.83	6.14	17.89	19.61	16.61	41517	0.48	18.37	1,628,441
20/06/2018	1.76	1.91	1.62	5.97	5.82	6.11	18.22	19.72	16.92	44113	0.51	18.73	1,662,788
21/06/2018	1.72	1.83	1.62	6.01	5.90	6.11	17.87	18.95	16.92	43597	0.50	18.37	1,631,093
22/06/2018	1.53	1.71	1.47	6.20	6.02	6.26	16.05	17.77	15.41	41481	0.48	16.53	1,469,710
23/06/2018	1.47	1.56	1.40	6.26	6.17	6.33	15.43	16.29	14.81	35222	0.41	15.84	1,403,444
24/06/2018	1.45	1.55	1.40	6.28	6.18	6.33	15.29	16.21	14.73	32005	0.37	15.66	1,384,936
25/06/2018	1.37	1.44	1.34	6.36	6.29	6.39	14.49	15.13	14.23	37349	0.43	14.92	1,326,320
26/06/2018	1.33	1.36	1.30	6.40	6.37	6.43	14.05	14.41	13.82	36471	0.42	14.48	1,287,214
27/06/2018	1.29	1.33	1.27	6.44	6.41	6.46	13.71	14.05	13.53	35051	0.41	14.12	1,254,899
28/06/2018	1.26	1.30	1.24	6.47	6.43	6.50	13.40	13.80	13.18	33711	0.39	13.79	1,225,185
29/06/2018	1.32	1.41	1.25	6.41	6.32	6.48	13.99	14.89	13.30	40504	0.47	14.46	1,289,857
30/06/2018	1.40	1.45	1.34	6.33	6.28	6.39	14.74	15.27	14.19	37349	0.43	15.17	1,347,896
01/07/2018	1.34	1.45	1.29	6.39	6.29	6.44	14.20	15.20	13.75	29381	0.34	14.54	1,285,888
02/07/2018	1.24	1.31	1.21	6.49	6.43	6.52	13.24	13.85	12.96	29170	0.34	13.57	1,201,975
03/07/2018	1.22	1.26	1.18	6.51	6.47	6.55	12.99	13.38	12.64	41211	0.48	13.47	1,204,835
04/07/2018	1.28	1.39	1.22	6.45	6.34	6.51	13.60	14.64	13.06	38531	0.45	14.04	1,251,690
05/07/2018	1.31	1.38	1.28	6.42	6.35	6.45	13.94	14.54	13.62	34660	0.40	14.34	1,273,537
06/07/2018	1.37	1.57	1.26	6.36	6.16	6.47	14.47	16.44	13.46	35507	0.41	14.88	1,321,251
07/07/2018	1.41	1.52	1.35	6.32	6.21	6.38	14.87	15.94	14.28	36720	0.43	15.29	1,358,012
08/07/2018	1.27	1.35	1.23	6.46	6.38	6.51	13.47	14.30	13.08	36675	0.42	13.90	1,237,557
09/07/2018	1.21	1.24	1.20	6.52	6.49	6.53	12.98	13.19	12.81	36397	0.42	13.40	1,193,864
10/07/2018	1.21	1.25	1.18	6.52	6.48	6.55	12.93	13.33	12.66	35188	0.41	13.34	1,187,557
11/07/2018	1.22	1.26	1.19	6.51	6.47	6.54	13.04	13.39	12.73	36536	0.42	13.46	1,199,712
12/07/2018	1.25	1.30	1.21	6.48	6.44	6.52	13.29	13.76	12.93	29757	0.34	13.63	1,207,349
13/07/2018	1.23	1.30	1.21	6.50	6.44	6.52	13.18	13.76	12.90	35805	0.41	13.59	1,210,213
14/07/2018	1.22	1.25	1.17	6.51	6.48	6.56	13.01	13.30	12.56	37662	0.44	13.45	1,199,339
15/07/2018	1.23	1.27	1.20	6.50	6.46	6.53	13.17	13.55	12.80	36611	0.42	13.59	1,210,836
16/07/2018	1.24	1.28	1.21	6.49	6.45	6.53	13.27	13.65	12.89	35611	0.41	13.68	1,217,377
17/07/2018	1.28	1.35	1.23	6.45	6.38	6.50	13.61	14.27	13.11	23506	0.27	13.89	1,223,198
18/07/2018	1.28	1.33	1.23	6.45	6.40	6.51	13.58	14.10	13.08	20275	0.25	13.82	1,214,190
19/07/2018	1.20	1.26	1.15	6.53	6.47	6.59	12.85	13.41	12.31	26855	0.31	13.16	1,163,945
20/07/2018	1.10	1.14	1.05	6.63	6.59	6.68	11.88	12.29	11.38	29451	0.34	12.22	1,084,986
21/07/2018	1.04	1.08	1.01	6.69	6.65	6.72	11.32	11.73	11.01	28784	0.33	11.65	1,035,337
22/07/2018	1.06	1.11	1.01	6.67	6.62	6.72	11.50	11.96	11.03	30155	0.35	11.84	1,053,497
23/07/2018	1.11	1.14	1.08	6.62	6.59	6.65	11.97	12.25	11.71	30789	0.36	12.32	1,095,364
24/07/2018	1.13	1.16	1.11	6.60	6.57	6.62	12.18	12.45	11.94	31160	0.36	12.54	1,114,642
25/07/2018	1.13	1.17	1.11	6.60	6.56	6.62	12.21	12.56	11.94	29602	0.34	12.55	1,113,829

26/07/2018	1.12	1.18	1.07	6.61	6.55	6.66	12.09	12.61	11.61	32052	0.37	12.46	1,108,647
27/07/2018	1.16	1.35	1.10	6.57	6.38	6.63	12.45	14.30	11.91	32077	0.37	12.82	1,139,888
28/07/2018	1.20	1.33	1.13	6.53	6.40	6.59	12.83	14.08	12.31	32077	0.37	13.20	1,172,240
29/07/2018	1.13	1.17	1.10	6.60	6.56	6.63	12.20	12.56	11.85	22086	0.26	12.46	1,098,209
30/07/2018	1.13	1.16	1.09	6.60	6.57	6.64	12.13	12.46	11.80	32096	0.37	12.50	1,112,235
31/07/2018	1.12	1.16	1.08	6.61	6.57	6.65	12.08	12.49	11.73	43462	0.50	12.59	1,130,930
01/08/2018	1.10	1.14	1.07	6.63	6.59	6.67	11.84	12.24	11.54	30126	0.35	12.19	1,083,089
02/08/2018	1.06	1.12	1.04	6.67	6.61	6.70	11.54	12.05	11.26	35108	0.41	11.94	1,066,979
03/08/2018	1.01	1.05	0.96	6.72	6.68	6.77	11.04	11.37	10.55	32979	0.38	11.43	1,020,149
04/08/2018	0.98	1.02	0.94	6.75	6.72	6.79	10.71	11.06	10.38	30090	0.35	11.06	985,406
05/08/2018	0.97	1.02	0.92	6.76	6.71	6.81	10.60	11.12	10.18	35002	0.41	11.00	985,589
06/08/2018	0.97	1.03	0.92	6.76	6.70	6.81	10.65	11.18	10.19	32219	0.37	11.02	984,760
07/08/2018	0.98	1.03	0.94	6.75	6.70	6.79	10.75	11.25	10.32	31219	0.36	11.11	991,128
08/08/2018	0.99	1.05	0.93	6.74	6.68	6.80	10.83	11.42	10.28	30258	0.35	11.18	995,824
09/08/2018	0.99	1.04	0.93	6.74	6.69	6.78	10.83	11.28	10.46	27697	0.32	11.15	990,719
10/08/2018	0.96	1.03	0.92	6.77	6.70	6.81	10.56	11.21	10.14	24851	0.29	10.85	962,385
11/08/2018	0.95	1.07	0.90	6.78	6.66	6.83	10.45	11.63	9.98	24647	0.29	10.73	951,999
12/08/2018	1.01	1.09	0.96	6.72	6.64	6.77	11.03	11.78	10.51	23197	0.27	11.30	999,667
13/08/2018	0.93	0.98	0.90	6.80	6.75	6.83	10.28	10.72	9.98	23905	0.28	10.56	936,102
14/08/2018	0.90	0.94	0.85	6.83	6.79	6.88	9.92	10.33	9.48	25260	0.29	10.21	907,576
15/08/2018	0.89	0.96	0.85	6.84	6.77	6.88	9.91	10.52	9.48	24870	0.29	10.20	905,748
16/08/2018	0.91	0.97	0.86	6.82	6.77	6.87	10.03	10.58	9.57	26646	0.31	10.34	920,232
17/08/2018	0.89	0.94	0.84	6.84	6.79	6.89	9.85	10.34	9.41	23466	0.27	10.12	898,195
18/08/2018	0.86	0.90	0.82	6.87	6.83	6.91	9.55	9.95	9.22	22700	0.26	9.82	870,841
19/08/2018	0.83	0.87	0.79	6.90	6.86	6.94	9.33	9.65	8.93	24024	0.28	9.60	853,843
20/08/2018	0.82	0.86	0.79	6.91	6.87	6.94	9.16	9.56	8.87	25117	0.29	9.46	842,040
21/08/2018	0.79	0.87	0.71	6.94	6.86	7.02	8.88	9.67	8.17	24045	0.28	9.16	815,350
22/08/2018	0.82	0.86	0.77	6.91	6.87	6.96	9.15	9.58	8.70	25907	0.30	9.45	842,166
23/08/2018	0.82	0.86	0.78	6.91	6.87	6.95	9.16	9.58	8.83	31046	0.36	9.52	853,145
24/08/2018	0.79	0.83	0.76	6.94	6.90	6.97	8.91	9.32	8.61	26526	0.31	9.22	822,969
25/08/2018	0.77	0.80	0.75	6.96	6.93	6.98	8.74	8.97	8.53	25645	0.30	9.04	806,855
26/08/2018	0.77	0.81	0.72	6.96	6.92	7.02	8.71	9.11	8.18	24568	0.28	9.00	802,016
27/08/2018	0.77	0.82	0.73	6.96	6.91	7.00	8.69	9.17	8.34	26951	0.31	9.01	805,076
28/08/2018	0.76	0.81	0.72	6.97	6.92	7.01	8.64	9.09	8.23	29756	0.34	8.99	806,061
29/08/2018	0.78	0.83	0.73	6.95	6.90	7.00	8.76	9.27	8.32	26724	0.31	9.07	809,948
30/08/2018	0.77	0.81	0.73	6.96	6.92	6.98	8.72	9.13	8.47	28545	0.33	9.05	810,420
31/08/2018	0.76	0.80	0.71	6.97	6.93	7.02	8.58	8.96	8.17	26309	0.30	8.89	794,082
01/09/2018	0.73	0.77	0.69	7.00	6.96	7.04	8.30	8.72	7.93	26741	0.31	8.61	770,735
02/09/2018	0.72	0.78	0.68	7.01	6.95	7.05	8.24	8.78	7.80	27365	0.32	8.56	766,994
03/09/2018	0.72	0.76	0.68	7.01	6.97	7.05	8.21	8.65	7.88	23711	0.27	8.49	756,932
04/09/2018	0.71	0.77	0.67	7.02	6.96	7.06	8.13	8.69	7.73	24983	0.29	8.42	752,661
05/09/2018	0.70	0.75	0.64	7.03	6.98	7.09	8.07	8.52	7.43	21583	0.25	8.32	740,377
06/09/2018	0.71	0.77	0.67	7.02	6.96	7.06	8.15	8.70	7.73	27156	0.31	8.47	758,678
07/09/2018	0.72	0.91	0.68	7.01	6.82	7.05	8.24	10.04	7.82	18875	0.22	8.46	749,434
08/09/2018	1.16	1.27	0.99	6.57	6.47	6.74	12.41	13.47	10.80	25575	0.30	12.71	1,123,739
09/09/2018	1.70	2.54	1.21	6.03	5.19	6.52	17.64	25.73	12.94	34269	0.40	18.03	1,592,204
10/09/2018	2.05	2.73	1.42	5.68	5.00	6.31	21.00	27.60	14.98	46008	0.53	21.53	1,906,590
11/09/2018	1.85	2.23	1.52	5.88	5.50	6.21	19.05	22.79	15.93	43073	0.50	19.55	1,732,256
12/09/2018	1.38	1.52	1.26	6.35	6.21	6.47	14.54	15.94	13.39	37244	0.43	14.97	1,331,004
13/09/2018	1.19	1.28	1.15	6.54	6.45	6.58	12.79	13.58	12.34	34056	0.39	13.18	1,173,036
14/09/2018	1.17	1.47	1.09	6.56	6.26	6.64	12.57	15.47	11.76	33748	0.39	12.96	1,153,382
15/09/2018	1.45	1.53	1.39	6.28	6.20	6.35	15.26	15.99	14.62	38125	0.44	15.71	1,395,140
16/09/2018	1.68	1.90	1.45	6.05	5.83	6.28	17.43	19.55	15.29	39871	0.46	17.90	1,586,058
17/09/2018	1.32	1.48	1.21	6.41	6.25	6.53	14.01	15.55	12.89	33172	0.38	14.39	1,276,719
18/09/2018	1.14	1.21	1.09	6.59	6.52	6.64	12.25	12.90	11.76	27842	0.32	12.58	1,114,346
19/09/2018	1.06	1.09	1.03	6.67	6.64	6.70	11.47	11.76	11.18	29127	0.34	11.81	1,049,302
20/09/2018	1.03	1.35	0.99	6.70	6.38	6.75	11.25	14.25	10.77	31410	0.36	11.62	1,035,045
21/09/2018	2.48	3.21	1.40	5.25	4.52	6.33	25.19	32.23	14.73	42949	0.50	25.68	2,262,089
22/09/2018	1.81	2.29	1.55	5.92	5.44	6.18	18.71	23.35	16.18	42456	0.49	19.20	1,701,207
23/09/2018	1.42	1.56	1.32	6.31	6.17	6.41	14.92	16.27	13.98	37958	0.44	15.36	1,365,244
24/09/2018	1.24	1.32	1.19	6.49	6.41	6.54	13.27	13.97	12.75	40663	0.47	13.74	1,227,595
25/09/2018	1.15	1.20	1.10	6.58	6.54	6.63	12.39	12.80	11.92	25875	0.30	12.69	1,122,262
26/09/2018	1.08	1.11	1.05	6.65	6.63	6.68	11.66	11.93	11.43	25875	0.30	11.96	1,058,927
27/09/2018	1.04	1.06	1.03	6.69	6.67	6.70	11.35	11.51	11.19	26006	0.30	11.65	1,032,753
28/09/2018	1.02	1.04	1.01	6.71	6.69	6.72	11.10	11.27	10.98	24485	0.28	11.38	1,007,874
29/09/2018	0.98	1.00	0.96	6.75	6.73	6.77	10.70	10.92	10.50	29112	0.34	11.03	982,279
30/09/2018	1.27	2.53	0.95	6.46	5.20	6.78	13.54	25.65	10.48	36692	0.42	13.96	1,243,195
01/10/2018	1.81	2.34	1.46	5.92	5.39	6.27	18.71	23.79	15.36	45571	0.53	19.24	1,707,662
02/10/2018	1.32	1.46	1.18	6.41	6.27	6.55	13.97	15.36	12.69	46940	0.54	14.51	1,300,469
03/10/2018	1.11	1.18	1.07	6.62	6.55	6.66	12.02	12.64	11.60	49792	0.58	12.59	1,137,864

04/10/2018	1.04	1.07	1.01	6.69	6.66	6.72	11.29	11.57	10.98	35215	0.41	11.70	1,046,067
05/10/2018	1.03	1.05	1.00	6.70	6.68	6.73	11.17	11.43	10.90	31343	0.36	11.53	1,027,782
06/10/2018	1.02	1.05	1.01	6.71	6.68	6.72	11.11	11.42	10.98	30510	0.35	11.46	1,020,711
07/10/2018	1.12	1.24	1.00	6.61	6.49	6.73	12.09	13.24	10.93	34047	0.39	12.49	1,112,766
08/10/2018	1.20	1.24	1.17	6.53	6.49	6.57	12.86	13.19	12.51	32946	0.38	13.25	1,177,366
09/10/2018	1.10	1.16	1.06	6.63	6.57	6.67	11.84	12.46	11.48	35846	0.41	12.25	1,094,564
10/10/2018	1.02	1.06	0.99	6.71	6.67	6.74	11.08	11.47	10.79	43380	0.50	11.58	1,043,861
11/10/2018	0.96	0.99	0.94	6.77	6.74	6.79	10.53	10.85	10.32	50521	0.58	11.11	1,010,581
12/10/2018	0.93	0.95	0.90	6.80	6.79	6.83	10.24	10.39	9.99	57243	0.66	10.91	999,477
13/10/2018	0.88	0.91	0.86	6.85	6.83	6.87	9.72	10.00	9.54	46158	0.53	10.26	932,464
14/10/2018	0.85	0.87	0.83	6.88	6.86	6.90	9.45	9.63	9.26	34844	0.40	9.85	885,792
15/10/2018	0.82	0.85	0.80	6.91	6.88	6.93	9.16	9.47	8.97	31151	0.36	9.53	854,136
16/10/2018	0.80	0.82	0.78	6.93	6.91	6.95	8.97	9.15	8.83	29109	0.34	9.31	833,161
17/10/2018	0.79	0.83	0.77	6.94	6.91	6.96	8.91	9.23	8.72	26985	0.31	9.22	823,862
18/10/2018	0.79	0.82	0.77	6.94	6.91	6.96	8.89	9.17	8.71	26588	0.31	9.20	821,103
19/10/2018	0.77	0.80	0.75	6.96	6.93	6.98	8.67	8.96	8.49	26560	0.31	8.98	802,605
20/10/2018	0.75	0.77	0.73	6.98	6.96	7.01	8.47	8.73	8.27	34568	0.40	8.87	800,811
21/10/2018	0.74	0.77	0.72	6.99	6.96	7.01	8.45	8.68	8.23	34298	0.40	8.84	798,306
22/10/2018	0.73	0.80	0.69	7.00	6.93	7.04	8.35	9.00	7.93	33781	0.39	8.74	788,852
23/10/2018	0.73	0.78	0.68	7.00	6.95	7.05	8.29	8.78	7.87	34573	0.40	8.69	785,483
24/10/2018	0.76	0.84	0.71	6.97	6.89	7.02	8.60	9.34	8.17	31017	0.36	8.96	805,326
25/10/2018	1.27	1.50	0.84	6.46	6.23	6.89	13.56	15.74	9.34	29623	0.34	13.90	1,230,650
26/10/2018	1.62	2.13	1.19	6.11	5.60	6.54	16.86	21.79	12.76	37383	0.43	17.29	1,531,561
27/10/2018	1.16	1.32	1.08	6.37	6.41	6.65	12.46	14.04	11.66	51294	0.59	13.05	1,179,180
28/10/2018	1.68	1.81	1.31	6.05	5.92	6.42	17.45	18.72	13.89	45017	0.52	17.97	1,597,528
29/10/2018	1.49	1.55	1.43	6.24	6.18	6.30	15.61	16.21	15.02	28278	0.33	15.94	1,405,408
30/10/2018	1.32	1.44	1.23	6.41	6.30	6.48	13.96	15.11	13.32	38147	0.44	14.40	1,282,094
31/10/2018	1.39	1.47	1.33	6.34	6.26	6.40	14.67	15.40	14.12	38748	0.45	15.12	1,345,298
01/11/2018	2.03	3.68	1.31	5.70	4.05	6.42	20.85	36.69	13.90	58822	0.68	21.53	1,918,983
02/11/2018	2.08	3.26	1.57	5.65	4.47	6.16	21.30	32.63	16.40	56183	0.65	21.95	1,952,449
03/11/2018	2.14	3.78	1.49	5.59	3.95	6.24	21.84	37.69	15.64	72719	0.84	22.69	2,032,730
04/11/2018	2.16	3.27	1.63	5.57	4.46	6.08	22.13	32.80	17.17	57498	0.67	22.79	2,026,705
05/11/2018	1.57	1.65	1.51	6.16	6.08	6.22	16.45	17.17	15.81	55108	0.64	17.08	1,531,213
06/11/2018	1.40	1.51	1.31	6.33	6.22	6.42	14.78	15.86	13.90	51172	0.59	15.37	1,379,233
07/11/2018	1.24	1.32	1.18	6.49	6.41	6.55	13.21	13.97	12.62	45996	0.53	13.74	1,232,960
08/11/2018	1.13	1.18	1.10	6.60	6.55	6.63	12.16	12.63	11.84	41767	0.48	12.63	1,134,521
09/11/2018	1.11	1.13	1.09	6.62	6.60	6.64	11.94	12.14	11.78	38697	0.45	12.39	1,108,849
10/11/2018	1.04	1.09	1.01	6.69	6.64	6.72	11.34	11.78	11.00	34323	0.40	11.73	1,048,061
11/11/2018	0.98	1.01	0.95	6.75	6.72	6.78	10.76	11.05	10.46	31881	0.37	11.12	993,007
12/11/2018	0.93	0.95	0.91	6.80	6.78	6.82	10.24	10.46	10.02	34489	0.40	10.64	953,423
13/11/2018	1.07	2.05	0.89	6.66	5.68	6.84	11.59	20.99	9.88	47441	0.55	12.14	1,096,479
14/11/2018	2.13	2.82	1.64	5.60	4.91	6.09	21.77	28.40	17.07	61565	0.71	22.48	2,003,934
15/11/2018	1.58	1.72	1.46	6.15	6.01	6.28	16.46	17.85	15.30	47740	0.55	17.01	1,517,464
16/11/2018	1.42	1.60	1.29	6.31	6.13	6.44	14.98	16.66	13.73	39648	0.46	15.44	1,373,846
17/11/2018	1.20	1.30	1.12	6.53	6.43	6.61	12.81	13.79	12.09	32935	0.38	13.19	1,172,770
18/11/2018	1.08	1.13	1.04	6.65	6.60	6.69	11.65	12.13	11.34	32427	0.38	12.03	1,071,838
19/11/2018	1.01	1.05	0.98	6.72	6.68	6.75	11.04	11.38	10.71	32957	0.38	11.42	1,019,474
20/11/2018	0.96	0.99	0.95	6.77	6.74	6.78	10.58	10.82	10.44	33861	0.39	10.97	981,539
21/11/2018	1.20	1.56	0.95	6.53	6.17	6.78	12.88	16.34	10.40	41123	0.48	13.36	1,195,132
22/11/2018	1.18	1.30	1.13	6.55	6.43	6.60	12.64	13.84	12.20	44183	0.51	13.15	1,180,542
23/11/2018	1.19	1.23	1.12	6.54	6.50	6.61	12.74	13.11	12.10	40288	0.47	13.21	1,181,265
24/11/2018	1.06	1.11	1.02	6.67	6.62	6.71	11.51	12.01	11.15	32436	0.38	11.89	1,059,306
25/11/2018	1.08	1.41	1.01	6.65	6.32	6.72	11.70	14.86	11.02	42369	0.49	12.19	1,095,760
26/11/2018	3.11	3.59	1.46	4.62	4.14	6.27	31.27	35.82	15.36	91490	1.06	32.33	2,884,435
27/11/2018	2.64	3.21	2.13	5.09	4.52	5.60	26.72	32.22	21.80	72535	0.84	27.56	2,453,371
28/11/2018	1.81	2.12	1.57	5.92	5.61	6.16	18.67	21.71	16.40	57154	0.66	19.33	1,727,121
29/11/2018	1.46	1.58	1.36	6.27	6.15	6.37	15.31	16.47	14.35	57551	0.67	15.98	1,438,150
30/11/2018	1.28	1.36	1.22	6.45	6.37	6.51	13.63	14.38	13.05	50601	0.59	14.21	1,278,584
01/12/2018	1.16	1.22	1.12	6.57	6.51	6.61	12.49	13.03	12.06	47194	0.55	13.04	1,173,812
02/12/2018	1.08	1.13	1.02	6.65	6.61	6.71	11.65	12.12	11.11	48489	0.56	12.22	1,103,920
03/12/2018	1.00	1.03	0.97	6.73	6.70	6.76	10.89	11.20	10.63	43090	0.50	11.39	1,026,763
04/12/2018	0.93	0.98	0.90	6.80	6.75	6.83	10.27	10.72	9.97	39375	0.46	10.72	965,647
05/12/2018	0.87	0.91	0.85	6.86	6.82	6.89	9.71	10.06	9.43	36925	0.43	10.14	912,933
06/12/2018	0.83	0.87	0.80	6.90	6.86	6.93	9.33	9.66	8.99	37686	0.44	9.76	881,280
07/12/2018	0.81	0.83	0.80	6.92	6.90	6.93	9.12	9.25	9.00	40330	0.47	9.58	868,352
08/12/2018	0.80	0.82	0.79	6.93	6.91	6.94	9.00	9.16	8.87	37311	0.43	9.43	852,102
09/12/2018	1.14	1.46	0.74	6.59	6.27	6.99	12.27	15.32	8.44	55537	0.64	12.91	1,171,339
10/12/2018	1.23	1.41	1.09	6.50	6.32	6.64	13.11	14.86	11.75	43430	0.50	13.61	1,219,391
11/12/2018	1.72	2.20	1.09	6.01	5.53	6.64	17.83	22.44	11.82	62708	0.73	18.55	1,665,824
12/12/2018	1.50	1.69	1.35	6.23	6.04	6.38	15.70	17.54	14.31	63641	0.74	16.44	1,483,989

13/12/2018	1.98	3.40	1.61	5.75	4.33	6.12	20.36	34.06	16.75	82669	0.96	21.31	1,924,173
14/12/2018	3.05	3.72	2.44	4.68	4.01	5.29	30.68	37.09	24.78	115809	1.34	32.02	2,882,296
15/12/2018	1.83	2.39	1.55	5.90	5.34	6.18	18.94	24.31	16.24	72840	0.84	19.78	1,781,993
16/12/2018	1.75	2.15	1.54	5.98	5.60	6.19	18.14	21.76	16.15	94711	1.10	19.23	1,756,302
17/12/2018	2.04	2.18	1.89	5.69	5.55	5.84	20.93	22.26	19.50	106616	1.25	22.16	2,021,345
18/12/2018	1.89	2.01	1.79	5.84	5.73	5.94	19.44	20.59	18.51	86764	1.00	20.45	1,853,298
19/12/2018	1.65	1.81	1.46	6.08	5.92	6.27	17.20	18.73	15.37	67884	0.79	17.99	1,622,144
20/12/2018	2.03	2.62	1.44	5.70	5.11	6.29	20.84	26.55	15.17	85919	0.99	21.83	1,972,138
21/12/2018	1.72	2.15	1.47	6.01	5.58	6.26	17.81	21.95	15.47	66749	0.77	18.58	1,672,175
22/12/2018	1.35	1.48	1.27	6.38	6.25	6.46	14.27	15.54	13.52	66777	0.77	15.05	1,366,909
23/12/2018	1.37	1.40	1.31	6.36	6.33	6.42	14.47	14.79	13.94	67887	0.79	15.26	1,386,226
24/12/2018	1.27	1.36	1.22	6.46	6.37	6.51	13.55	14.34	13.03	54903	0.64	14.19	1,280,951
25/12/2018	1.14	1.23	1.06	6.59	6.50	6.67	12.29	13.10	11.52	49306	0.57	12.86	1,160,695
26/12/2018	1.07	1.11	1.04	6.66	6.62	6.69	11.60	12.00	11.32	43064	0.50	12.10	1,088,471
27/12/2018	1.03	1.09	0.98	6.70	6.64	6.75	11.18	11.82	10.75	34919	0.40	11.58	1,035,376
28/12/2018	0.97	1.00	0.94	6.76	6.73	6.79	10.64	10.90	10.37	34928	0.40	11.04	988,949
29/12/2018	1.78	2.41	0.99	5.95	5.33	6.74	18.41	24.44	10.85	48179	0.56	18.97	1,687,413
30/12/2018	1.53	1.88	1.35	6.20	5.85	6.38	16.06	19.38	14.29	34929	0.40	16.47	1,457,507
31/12/2018	1.22	1.35	1.15	6.51	6.38	6.58	13.07	14.27	12.33	35502	0.41	13.49	1,200,641

Appendix B

Weather Data

MONTHLY PRECIPITATION 1979-2019

YEAR	Jan mm	Feb mm	Mar mm	Apr mm	May mm	Jun mm	Jul mm	Aug mm	Sept mm	Oct mm	Nov mm	Dec mm	TOTAL
*1979	357.5	264.9	256.7	161.0	102.8	70.8	124.8	46.7	383.8	343.0	187.0	619.8	2918.7
1980	269.8	296.2	89.5	240.7	51.7	87.3	69.5	36.9	181.0	179.9	496.8	706.4	2705.7
1981	346.4	427.8	117.7	277.7	114.3	125.2	78.1	62.6	310.2	450.3	466.3	412.0	3188.6
1982	298.5	505.4	109.9	193.2	22.4	27.1	18.5	34.5	89.4	778.9	212.7	492.7	2783.2
1983	529.5	624.4	375.3	83.5	41.5	130.0	94.7	59.6	59.7	217.8	619.3	192.8	3028.1
*1984	399.3	519.5	256.7	262.9	192.7	31.5	8.8	40.3	95.0	576.1	339.8	220.1	2942.7
*1985	64.0	175.2	147.5	114.2	85.2	21.1	32.3	21.2	76.9	319.1	459.0	369.7	1885.4
*1986	357.5	264.9	418.1	88.2	238.9	89.2	41.3	4.0	54.0	589.7	459.0	390.0	2994.8
*1987	357.5	336.8	425.3	262.7	223.2	184.0	59.4	18.3	98.4	83.8	591.8	437.4	3078.6
1988	343.2	202.8	211.9	215.4	215.4	80.0	25.4	29.1	114.2	246.4	581.5	201.2	2466.5
1989	329.3	102.3	224.0	198.0	62.5	71.8	41.7	41.8	17.6	339.4	249.8	252.6	1930.8
1990	372.0	282.9	122.5	58.6	81.9	129.8	31.3	70.3	18.6	565.0	806.4	343.9	2883.2
1991	353.0	542.7	85.9	126.1	80.1	27.9	33.3	206.8	8.0	59.9	596.4	610.0	2730.1
1992	859.7	305.2	45.2	244.4	6.0	41.2	10.9	35.6	89.9	390.0	257.2	241.2	2526.5
1993	57.4	55.0	288.5	207.3	148.0	64.4	77.2	92.4	1.3	179.7	141.2	393.0	1705.4
1994	258.2	264.9	203.0	149.3	79.0	137.1	6.2	47.4	74.1	218.5	379.6	498.7	2316.0
*1995	357.5	264.9	253.0	162.0	95.7	66.8	41.9	56.7	114.1	320.8	459.0	369.7	2562.1
*1996	357.5	264.9	253.0	162.0	95.7	66.8	41.9	56.7	114.1	320.8	459.0	369.7	2562.1
1997	357.5	64.3	259.2	216.9	124.2	182.8	72.0	114.4	0.0	442.0	348.0	374.2	2555.5
1998	571.3	418.5	158.6	20.6	36.8	14.2	67.2	2.6	3.0	130.0	472.5	279.4	2174.7
1999	219.2	295.1	173.5	96.0	50.0	16.0	1.0	114.1	54.5	138.0	666.5	183.1	2007.0
2000	50.2	218.3	98.6	75.8	131.5	49.9	123.6	51.6	61.9	324.6	168.2	125.2	1479.4
*2001	332.6	123.4	144.4	107.3	132.1	38.4	38.0	163.2	67.0	199.8	519.2	367.1	2232.5
2002	194.6	133.5	56.4	92.9	41.4	22.9	28.3	26.8	50.6	33.8	588.0	288.2	1557.4
2003	471.1	61.1	412.0	176.9	50.3	51.4	44.0	30.0	45.1	557.8	94.0	347.5	2341.2
2004	327.0	133.6	159.9	39.5	24.1	42.0	23.0	73.5	156.5	218.0	488.5	340.0	2025.6
2005	433.0	70.0	223.0	396.2	305.9	57.5	100.3	54.0	98.0	514.9	268.2	521.5	3042.5
2006	615.5	315.5	378.5	125.0	75.5	46.0	28.0	5.2	76.5	139.0	811.0	560.5	3176.2
2007	538.0	287.9	438.3	207.8	75.4	128.8	71.0	69.0	167.1	409.6	491.3	415.5	3299.7
2008	250.0	176.0	188.4	59.0	79.5	29.2	8.0	161.6	21.8	260.4	457.6	162.8	1854.3
2009	139.6	138.5	290.5	91.4	171.0	43.5	34.9	17.0	164.7	321.0	882.4	258.0	2552.5
2010	666.1	353.0	380.8	222.5	171.0	60.4	2.4	18.5	268.7	477.6	284.7	629.3	3535.0
2011	283.6	327.1	528.2	165.9	80.1	11.9	81.9	42.0	339.8	295.4	478.1	199.8	2833.8
2012	600.5	241.1	424.1	199.3	54.7	86.0	10.0	14.4	15.6	317.0	525.2	264.3	2752.2
2013	96.0	273.2	168.4	111.6	124.6	65.6	3.0	124.6	277.0	57.4	226.7	99.8	1627.9
2014	170.3	243.3	341.1	170.4	47.9	32.4	32.4	17.3	143.5	589.4	404.2	547.9	2740.1
2015	262.8	337.5	460.5	105.4	35.1	14.9	20.3	148.8	217.0	262.3	259.5	634.8	2758.9
2016	492.5	394.2	521.3	80.9	17.2	63.4	30.7	44.4	103.5	507.9	928.2	250.4	3434.6
2017	357.5	178.0	361.5	253.8	55.3	33.8	8.7	1.8	32.2	319.3	830.3	85.8	2518.0
2018	602.0	110.9	75.2	256.3	8.1	130.6	9.7	13.0	298.9	137.4	407.0	733.2	2782.3
# Years	40	40	40	40	40	40	40	40	40	40	40	40	40
Mean	357.5	264.9	253.0	162.0	95.7	66.8	41.9	56.7	114.1	320.8	459.0	369.7	2562.2
Median	332.6	273.2	217.5	163.5	79.3	54.5	32.4	41.9	83.2	318.0	469.4	347.5	2633.9
Q1 (Low)	261.6	166.0	146.7	95.2	49.5	32.2	16.6	20.5	49.2	194.8	280.6	248.1	2218.1
Q3 (High)	442.5	329.5	376.1	215.8	126.3	86.3	67.8	69.3	158.6	444.1	583.1	494.2	2924.7
IQR	180.9	163.5	229.4	120.6	76.9	54.2	51.2	48.8	109.3	249.3	302.6	246.1	706.7
Max	859.7	624.4	528.2	396.2	305.9	184.0	124.8	206.8	383.8	778.9	928.2	733.2	3535.0
Min	50.2	55.0	45.2	20.6	6.0	11.9	1.0	1.8	0.0	33.8	94.0	85.8	1479.4

*year denotes that average month precipitation values were used in lieu of missing data (updated to reflect averages to 2018)

Note: Data compiled from daily observations recorded at MFO's Powerhouse - Environment Canada Meteorological Station - Code #4 (360m A.S.L.)

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/01/2018 23:59	-2.2	4.3	1.100							
02/01/2018 23:59	-2.2	2	-0.100							
03/01/2018 23:59	-0.6	1.4	0.400							
04/01/2018 23:59	-1	2.5	0.839							
05/01/2018 23:59	0.586	2.526	1.653	0.272	0.715	0.355	0	2.14	1.755421	0.0
06/01/2018 23:59	-0.286	4.365	1.472	0.272	0.749	0.35	2.14	2.14	2.14	0.0
07/01/2018 23:59	0.123	4.263	1.831	0.272	0.783	0.359	0.1600552	2.14	1.566772	5.7
08/01/2018 23:59	0.02	3.173	1.811	0.272	0.715	0.357	0.1224785	2.14	1.721871	0.0
09/01/2018 23:59	-0.525	3.105	0.809	0.272	0.715	0.349	0.1378274	2.14	1.399665	3.2
10/01/2018 23:59	0.054	3.922	1.519	0.272	0.783	0.354	0.1491539	2.14	1.067695	3.3
11/01/2018 23:59	-0.014	2.118	1.05	0.272	0.749	0.349	0.1445522	2.14	0.5743431	4.9
12/01/2018 23:59	0.395	3.037	1.496	0.272	0.749	0.353	0.1414062	0.1689837	0.1589319	4.2
13/01/2018 23:59	0.831	3.548	1.91	0.272	0.749	0.357	0.1092846	0.149537	0.1366073	0.2
14/01/2018 23:59	0.565	2.765	1.545	0.272	0.749	0.354	0.09385419	0.135432	0.1237869	0.1
15/01/2018 23:59	0.994	4.91	2.167	0.272	0.749	0.358	0.07532668	0.1200843	0.1063225	0.2
16/01/2018 23:59	1.675	5.25	3.242	0.272	0.749	0.366	-0.01506329	0.07697511	0.05141902	0.5
17/01/2018 23:59	1.539	7.007	3.16	0.272	0.749	0.364	0.01305604	0.04039025	0.02516117	0.3
18/01/2018 23:59	1.233	6.699	2.849	0.272	0.783	0.363	0.01097584	0.02807045	0.01859762	0.3
19/01/2018 23:59	0.123	2.129	0.939	0.272	0.783	0.351	0.005424976	0.05846095	0.02573975	0.0
20/01/2018 23:59	-0.014	2.323	1.058	0.272	0.749	0.352	0.01241326	0.06892276	0.03993499	0.0
21/01/2018 23:59	0.089	4.639	1.088	0.272	0.749	0.353	0.03034472	0.06153369	0.04904284	0.0
22/01/2018 23:59	0.123	3.548	1.167	0.272	0.749	0.354	0.04387712	0.05893397	0.05103384	0.0
23/01/2018 23:59	0.054	2.765	0.999	0.272	0.749	0.35	0.03548002	0.05084944	0.04416302	0.1
24/01/2018 23:59	0.122	3.003	1.468	0.272	0.715	0.353	0.03860617	0.04975033	0.04637722	0.0
25/01/2018 23:59	-0.49	1.928	0.203	0.272	0.749	0.342	0.03623414	0.270417	0.1522029	0.0
26/01/2018 23:59	-0.831	1.383	0.017	0.272	0.783	0.344	0.250283	0.3851534	0.3295162	0.0
27/01/2018 23:59	-0.763	1.723	0.106	0.272	0.715	0.349	0.3217261	0.4462537	0.4074843	0.0
28/01/2018 23:59	-0.15	3.585	0.55	0.272	0.783	0.351	0.2905229	0.4562521	0.3861991	0.2
29/01/2018 23:59	0.803	7.277	3.061	0.272	0.749	0.362	0.1930968	0.3015745	0.239365	1.5
30/01/2018 23:59	-0.354	3.378	0.806	0.272	0.749	0.351	0.1850215	0.202518	0.1956052	0.4
31/01/2018 23:59	-0.559	1.617	0.316	0.272	0.715	0.347	0.1915629	0.2288574	0.2046232	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/02/2018 23:59	-0.286	2.152	0.454	0.272	0.749	0.346	0.215905	0.2245687	0.2201341	0.0
02/02/2018 23:59	0.191	6.83	3.228	0.272	0.749	0.364	0.1931726	0.2218531	0.2092354	0.1
03/02/2018 23:59	1.539	5.61	3.919	0.272	0.715	0.368	0.1550908	0.1931726	0.1799019	0.3
04/02/2018 23:59	3.468	11.39	6.822	0.272	0.749	0.388	0.05125141	0.1594484	0.113856	0.7
05/02/2018 23:59	0.77	9.74	5.083	0.272	0.783	0.38	0.02057862	0.0535984	0.03713259	0.8
06/02/2018 23:59	-0.286	5.541	2.767	0.272	0.749	0.364	0.005200386	0.02885294	0.02283397	0.1
07/02/2018 23:59	3.229	10.49	6.488	0.272	0.749	0.386	-0.007332087	0.02644467	0.01047386	0.2
08/02/2018 23:59	-0.521	9.5	4.478	0.272	0.782	0.376	0.007995367	0.01984382	0.01452301	0.0
09/02/2018 23:59	-1.84	5.031	0.23	0.272	0.749	0.344	-0.02284598	2.14	1.340734	0.0
10/02/2018 23:59	-2.692	6.12	0.331	0.272	0.749	0.349	-0.01802182	2.14	0.6251986	7.2
11/02/2018 23:59	-2.385	5.39	0.802	0.272	0.749	0.355	-0.02467585	2.14	0.3600405	2.7
12/02/2018 23:59	-4.008	4.937	-0.668	0.272	0.716	0.345	0.001398325	0.03586817	0.02460168	3.4
13/02/2018 23:59	-2.147	6.29	0.851	0.272	0.75	0.352	-0.001176119	2.14	0.4613307	0.0
14/02/2018 23:59	-1.397	4.569	0.593	0.272	0.783	0.355	-0.02767539	2.14	0.6214734	0.0
15/02/2018 23:59	-2.791	3.514	-0.124	0.272	0.783	0.348	-0.0124526	2.14	0.628014	0.0
16/02/2018 23:59	0.157	6.444	2.569	0.272	0.749	0.367	-0.0281055	2.14	0.273999	3.5
17/02/2018 23:59	-1.308	5.543	1.48	0.272	0.715	0.359	-0.009856701	2.14	0.7338675	0.0
18/02/2018 23:59	-6.69	-1.308	-3.142	0.272	0.716	0.336	0.01722932	2.14	0.1149262	6.2
19/02/2018 23:59	-8.56	1.578	-4.048	0.272	0.716	0.33	0.02317786	0.04368281	0.0335879	0.8
20/02/2018 23:59	-5.707	1.166	-2.425	0.272	0.749	0.332	0.02002954	0.03490973	0.02882434	0.0
21/02/2018 23:59	-6.417	-0.49	-3.121	0.272	0.716	0.333	0.01629758	0.05083823	0.03322972	0.0
22/02/2018 23:59	-6.251	2.833	-2.75	0.272	0.75	0.34	-0.01235914	2.14	0.1144234	0.0
23/02/2018 23:59	-4.419	2.152	-0.473	0.272	0.716	0.347	0.004058599	2.14	0.1233857	0.0
24/02/2018 23:59	-3.536	4.657	0.525	0.272	0.783	0.356	0.02201176	2.14	0.7328191	0.0
25/02/2018 23:59	-2.822	3.514	0.326	0.272	0.749	0.352	0.001186848	0.04625607	0.02760618	7.1
26/02/2018 23:59	-4.826	6.283	-0.404	0.272	0.749	0.352	-7.84397E-05	0.04412174	0.02705258	0.0
27/02/2018 23:59	0.054	5.745	2.233	0.272	0.749	0.367	-0.037467	2.14	0.2783809	0.0
28/02/2018 23:59	-0.014	1.587	0.453	0.272	0.749	0.355	-0.04457808	2.14	1.073933	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/03/2018 23:59	-1.032	3.003	0.506	0.272	0.749	0.356	-0.008678198	2.14	1.261407	0.0
02/03/2018 23:59	-0.763	3.275	0.406	0.272	0.783	0.353	-0.021137	2.14	0.2852367	9.8
03/03/2018 23:59	-1.942	7.08	1.314	0.272	0.783	0.361	-0.003268719	2.14	0.5433535	0.0
04/03/2018 23:59	-1.261	7.091	1.573	0.272	0.783	0.359	-0.000676394	0.04635835	0.01672668	5.4
05/03/2018 23:59	-2.181	6.256	1.235	0.272	0.783	0.359	0.0102632	0.03140354	0.02326182	0.0
06/03/2018 23:59	-0.218	5.497	2.082	0.272	0.749	0.362	0.01524019	0.0302186	0.02240822	0.0
07/03/2018 23:59	0.395	7.228	3.13	0.272	0.749	0.372	0.01271915	0.02711701	0.01813587	0.2
08/03/2018 23:59	0.054	3.805	2.005	0.272	0.749	0.368	0.01007152	0.05107641	0.02908645	0.0
09/03/2018 23:59	-1.363	9.19	2.633	0.272	0.715	0.368	0.003971815	0.0356946	0.02253697	0.1
10/03/2018 23:59	-1.261	8.41	2.252	0.272	0.749	0.366	0.006380558	0.03289151	0.01786391	0.2
11/03/2018 23:59	-3	13.5	4.130434783							0.0
12/03/2018 23:59	-0.761	12.9	4.49	0.272	0.749	0.381	-0.008616447	0.03125906	0.01138041	0.0
13/03/2018 23:59	0.662	7.467	4.072	0.272	0.749	0.373	0.004902363	0.02830267	0.01384794	0.0
14/03/2018 23:59	0.395	8.79	3.859	0.272	0.749	0.374	0.001348257	0.0320282	0.01457178	0.0
15/03/2018 23:59	-0.014	10.2	3.728	0.272	0.782	0.373	0.00061512	0.03068924	0.02203102	0.0
16/03/2018 23:59	-1.601	13.11	4.49	0.272	0.716	0.379	0.001911163	0.03433681	0.01405436	0.2
17/03/2018 23:59	1.131	10.48	5	0.272	0.749	0.379	0.000471354	0.02323484	0.01263405	0.0
18/03/2018 23:59	0.858	10	4.62	0.272	0.748	0.379	-0.002894402	0.04477119	0.01090953	0.0
19/03/2018 23:59	-0.661	13.72	5.157	0.272	0.783	0.382	0.008473635	0.04009771	0.02376582	0.0
20/03/2018 23:59	-0.558	11.62	4.969	0.272	0.748	0.382	0.004770279	0.03325343	0.01686186	0.2
21/03/2018 23:59	1.403	8.99	4.661	0.272	0.749	0.384	-0.00239563	0.02645874	0.01208559	0.0
22/03/2018 23:59	-0.32	4.525	2.367	0.272	0.715	0.369	0.005718946	0.05470252	0.03287102	0.0
23/03/2018 23:59	-0.559	4.398	0.817	0.272	0.749	0.359	0.005718946	2.14	0.3180643	0.0
24/03/2018 23:59	-1.908	8.91	1.564	0.272	0.749	0.367	0.01024938	0.04257131	0.02444725	2.9
25/03/2018 23:59	-2.044	7.027	1.519	0.272	0.749	0.362	-0.002556801	0.03295898	0.01792676	0.2
26/03/2018 23:59	1.403	7.091	4.098	0.272	0.749	0.375	0.02152896	0.03332281	0.02543467	0.0
27/03/2018 23:59	2.39	12.81	6.905	0.272	0.782	0.392	0.01308584	0.02607322	0.0203296	0.3
28/03/2018 23:59	0.531	11.28	5.468	0.272	0.748	0.383	0.01236749	0.02899671	0.01919069	0.0
29/03/2018 23:59	3.369	9.4	6.162	0.272	0.749	0.389	0.01197767	0.02899671	0.01960595	0.0
30/03/2018 23:59	2.833	14.53	7.076	0.272	0.749	0.397	0.00986886	0.02387285	0.0157472	0.0
31/03/2018 23:59	-0.15	11.9	5.493	0.272	0.748	0.386	0.0100534	0.03185201	0.01740075	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/04/2018 23:59	-1.431	7.125	2.748	0.272	0.749	0.37	0.009209156	0.04522896	0.02206694	0.0
02/04/2018 23:59	-2.992	9.91	2.445	0.272	0.75	0.368	0.01415181	0.03974128	0.02798262	0.0
03/04/2018 23:59	0.463	6.785	3.316	0.272	0.749	0.373	0.01269031	0.02139878	0.01727122	0.3
04/04/2018 23:59	0.32	5.065	2.918	0.272	0.783	0.367	0.01148629	0.0347681	0.019094	0.0
05/04/2018 23:59	-0.014	5.507	2.329	0.272	0.749	0.365	0.01982021	0.07399368	0.0427037	0.0
06/04/2018 23:59	3.269	13.31	7.292	0.272	0.782	0.394	-0.008026361	0.0300262	0.01513048	0.4
07/04/2018 23:59	4.554	7.874	5.817	0.272	0.749	0.387	0.01223063	0.03949809	0.03120748	0.0
08/04/2018 23:59	4.181	12.87	7.55	0.272	0.749	0.399	0.01892185	0.03595853	0.02850161	0.0
09/04/2018 23:59	4.52	12.16	7.968	0.272	0.749	0.401	0.0101018	0.03840113	0.02612269	0.0
10/04/2018 23:59	2.697	8.4	4.792	0.272	0.749	0.381	0.009776831	0.04217768	0.02775755	0.0
11/04/2018 23:59	1.743	5.439	3.038	0.272	0.715	0.372	0.01760054	0.03925633	0.03401701	0.0
12/04/2018 23:59	0.871	9.33	4.089	0.272	0.749	0.38	0.01465034	0.03914618	0.02937506	0.0
13/04/2018 23:59	0.18	6.929	3.174	0.272	0.749	0.368	0.01688552	0.04724121	0.03242637	0.0
14/04/2018 23:59	1.335	8.66	4.544	0.272	0.783	0.377	0.01214361	0.03817725	0.02857197	0.0
15/04/2018 23:59	-0.886	10.64	4.525	0.272	0.75	0.379	0.005485058	0.03697062	0.02159606	0.3
16/04/2018 23:59	3.239	12.06	6.018	0.272	0.749	0.388	0.01850176	0.03987026	0.03222749	0.0
17/04/2018 23:59	2.254	9.52	5.704	0.272	0.749	0.39	0.008300781	0.03822899	0.0253923	0.1
18/04/2018 23:59	1.675	11.68	5.972	0.272	0.749	0.385	0.00876689	0.04052448	0.02817526	0.0
19/04/2018 23:59	0.395	13.24	6.512	0.272	0.749	0.391	0.01310086	0.03099847	0.02439997	0.0
20/04/2018 23:59	2.619	8.65	5.988	0.272	0.749	0.386	0.0101161	0.03914547	0.02458469	0.0
21/04/2018 23:59	1.709	10.07	5.522	0.272	0.783	0.384	0.01265049	0.03737712	0.02684205	0.0
22/04/2018 23:59	-0.32	14.96	6.567	0.272	0.715	0.388	0.01343179	0.03384876	0.0246361	0.0
23/04/2018 23:59	1.073	18.57	9.11	0.272	0.783	0.396	0.01334786	0.03722668	0.02652576	0.0
24/04/2018 23:59	3.037	20.87	11.23	0.272	0.749	0.402	0.01188755	0.03722668	0.02351842	0.0
25/04/2018 23:59	3.786	23.9	12.81	0.272	0.715	0.405	0.01334929	0.02830744	0.02080593	0.2
26/04/2018 23:59	4.759	25.73	14.4	0.272	0.749	0.408	0.01075673	0.03155661	0.02013516	0.0
27/04/2018 23:59	6.862	25.97	14.37	0.272	0.715	0.413	0.009946108	0.03385544	0.02195885	0.0
28/04/2018 23:59	6.52	11.86	9.42	0.306	0.749	0.41	0.01258588	0.03123736	0.0233722	0.0
29/04/2018 23:59	5.813	11.42	8.13	0.272	0.748	0.402	0.01361203	0.03809619	0.02816286	0.0
30/04/2018 23:59	6.12	16.19	10.24	0.306	0.749	0.408	0.01144719	0.03809619	0.01960714	0.3

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/05/2018 23:59	3.82	19.62	10.77	0.272	0.783	0.407	0.004698038	0.03266501	0.01812686	0.0
02/05/2018 23:59	4.863	21.8	12.85	0.272	0.749	0.409	0.003749371	0.03014946	0.01622641	0.0
03/05/2018 23:59	7.502	21.88	13.54	0.306	0.748	0.415	0.01369238	0.03567839	0.02243905	0.0
04/05/2018 23:59	8.35	14.22	11.3	0.306	0.748	0.415	0.007617712	0.03189588	0.02124732	0.2
05/05/2018 23:59	8.21	21.82	13.59	0.306	0.749	0.415	0.004970312	0.03613949	0.01979854	0.0
06/05/2018 23:59	6.963	23.47	15.37	0.306	0.749	0.416	0.008591175	0.03396821	0.02535977	0.0
07/05/2018 23:59	8.59	23.03	15.34	0.34	0.749	0.417	0.007618904	0.03580523	0.02013361	0.3
08/05/2018 23:59	7.332	21.83	13.54	0.306	100	11.01	0.004705191	0.02901578	0.01624202	0.0
09/05/2018 23:59	7.128	14.56	10.11	0.306	0.749	0.412	0	0.02745533	0.01950429	0.0
10/05/2018 23:59	6.524	15.55	9.89	0.306	0.748	0.409	0.007271767	0.02401519	0.01515921	0.0
11/05/2018 23:59	4.263	23.51	12.92	0.272	0.748	0.409	0.00795269	0.03187013	0.016671	0.0
12/05/2018 23:59	6.46	27.39	16.11	0.306	0.749	0.414	0.005313396	0.02777553	0.01381893	0.0
13/05/2018 23:59	9.03	30.85	19.03	0.34	100	2.342	0.003363609	0.0327282	0.01854596	0.0
14/05/2018 23:59	11.71	29.78	20.17	0.374	100	5.157	0.00894165	0.03292632	0.01936745	0.0
15/05/2018 23:59	11.27	28.4	19.49	0.34	62.63	0.612	0.008238077	0.03414345	0.02011892	0.0
16/05/2018 23:59	9.64	24.98	16.92	0.374	100	10.83	0.01324368	0.02626586	0.01986404	0.0
17/05/2018 23:59	8.08	25.25	16.34	0.34	100	18.99	0.01065278	0.04075742	0.02129764	0.0
18/05/2018 23:59	9.1	25.73	16.06	0.374	100	23.14	0.009670496	0.02807593	0.01889897	0.0
19/05/2018 23:59	11.49	19.23	13.97	0.34	0.748	0.422	0.002758503	0.02130008	0.0145747	0.0
20/05/2018 23:59	10.88	18.91	13.74	0.374	100	3.307	0.006623268	0.01950979	0.01104242	0.0
21/05/2018 23:59	9.53	21.98	15	0.34	100	12.86	0.007757902	0.02726293	0.01538679	0.0
22/05/2018 23:59	9.03	25.9	17.6	0.34	100	10.66	0.006719351	0.03181076	0.01738583	0.0
23/05/2018 23:59	10.86	27.46	18.72	0.34	100	13.54	0.006105423	0.02570128	0.01610234	0.0
24/05/2018 23:59	12.03	22.35	17.57	0.374	100	2.287	0.006400585	0.02318907	0.01605826	0.0
25/05/2018 23:59	7.771	18.3	13.32	0.34	100	19.84	0.009144068	0.0281868	0.01573291	0.0
26/05/2018 23:59	6.869	15.57	11.87	0.374	100	44.28	0.008982182	0.02842379	0.01646703	0.0
27/05/2018 23:59	8.49	19.86	13.84	0.34	100	35.81	0.009722233	0.02443981	0.01519227	0.0
28/05/2018 23:59	9.26	20.47	13.98	0.374	100	32.78	0.009894848	0.03581381	0.01717003	0.0
29/05/2018 23:59	5.441	18.11	11.69	0.34	100	33.36	0.009251118	0.03945565	0.01656805	0.0
30/05/2018 23:59	4.263	18.64	10.03	0.306	100	35.65	0.006831169	0.02880001	0.01411484	0.0
31/05/2018 23:59	5.643	19.18	11.8	0.306	0.749	0.41	0.006102562	0.02211404	0.0144071	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/06/2018 23:59	7.023	12.45	9.78	0.306	0.783	0.412	0.004681587	0.02389026	0.01355008	0.0
02/06/2018 23:59	8.66	18.05	12.27	0.306	0.749	0.417	0.005804777	0.03567982	0.0174274	0.0
03/06/2018 23:59	7.568	15.47	11.3	0.34	0.783	0.415	0.005300283	0.02092385	0.01157368	0.0
04/06/2018 23:59	5.882	14.9	9.81	0.34	0.748	0.409	0.005038261	0.0309999	0.01396462	0.0
05/06/2018 23:59	5.95	11.9	8.59	0.272	0.783	0.405	0.008614063	0.03735423	0.01920598	0.0
06/06/2018 23:59	8.11	16.29	11.37	0.306	0.749	0.414	0.008759737	0.02121401	0.0133538	0.0
07/06/2018 23:59	8.49	12.37	10.24	0.306	0.782	0.412	0.008322239	0.02274585	0.01352098	0.0
08/06/2018 23:59	6.656	13.01	9.06	0.306	0.748	0.409	0.006843328	0.04177356	0.02724293	0.0
09/06/2018 23:59	7.065	14.87	11.33	0.34	0.782	0.418	0	0.02668095	0.01510216	0.3
10/06/2018 23:59	5.133	14.94	8.3	0.306	0.715	0.404	0.007309914	0.03390813	0.01708602	0.0
11/06/2018 23:59	2.935	18.37	10.78	0.272	0.749	0.402	0.002205849	0.02729893	0.01298846	0.0
12/06/2018 23:59	6.426	12.92	9.53	0.272	0.749	0.407	0.008289814	0.01878858	0.01312776	0.0
13/06/2018 23:59	7.84	14.93	11.11	0.306	0.749	0.413	0.008289814	0.02159405	0.01364259	0.0
14/06/2018 23:59	6.46	16.86	12.45	0.306	0.715	0.413	0.005949736	0.01734304	0.01140576	0.0
15/06/2018 23:59	9.13	22.34	15.14	0.34	0.748	0.419	0.007469654	0.02274346	0.01439868	0.0
16/06/2018 23:59	7.882	27.02	17.61	0.306	0.747	0.416	0.005803823	0.01955199	0.01361741	0.0
17/06/2018 23:59	11.23	30.52	20.76	0.306	0.714	0.419	0.007939816	0.02208138	0.01414668	0.0
18/06/2018 23:59	12.88	33.56	23.4	0.374	0.748	0.421	0.005409718	0.01876569	0.01399064	0.0
19/06/2018 23:59	15.75	32.47	23.38	0.374	0.748	0.419	0.005286455	0.02199101	0.01388028	0.0
20/06/2018 23:59	15.89	31.87	22.78	0.374	100	3.445	0.007956982	0.02016854	0.0160383	0.0
21/06/2018 23:59	14.8	27.55	21.13	0.374	100	20.73	0.009066105	0.02258587	0.01464197	0.0
22/06/2018 23:59	13.04	20.13	16.15	0.374	100	50.62	0.01311016	0.02018237	0.01598066	0.0
23/06/2018 23:59	9.68	26.1	17.59	0.34	100	0.748	0.01074004	0.02113438	0.01627692	0.0
24/06/2018 23:59	10.48	15.82	13.69	0.34	100	22.56	0.009634733	0.02384162	0.01531502	0.0
25/06/2018 23:59	8.11	16.35	12.2	0.34	0.749	0.417	0.01056528	0.0277698	0.01856762	0.0
26/06/2018 23:59	7.138	20.95	14.2	0.306	0.783	0.419	0.009466171	0.02775049	0.01475497	0.0
27/06/2018 23:59	10.38	22.02	14.69	0.34	14.66	0.436	0.008060694	0.02746224	0.01534142	0.0
28/06/2018 23:59	10.72	15.95	13.48	0.34	100	2.651	0.006836891	0.0204041	0.01249088	0.0
29/06/2018 23:59	11.43	18.44	14.32	0.374	0.748	0.42	0.009146214	0.03123689	0.01875702	0.0
30/06/2018 23:59	12.27	18.55	15.06	0.374	0.748	0.421	0.009146214	0.03313184	0.01820725	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/07/2018 23:59	10.89	20.44	14.76	0.34	0.748	0.42	0.008181334	0.01902533	0.0140976	0.0
02/07/2018 23:59	6.801	21.13	14.29	0.34	100	9.32	0.0101881	0.02526355	0.01566746	0.0
03/07/2018 23:59	7.983	23.98	16.25	0.34	100	15.92	0.006318092	0.02137113	0.01462053	0.0
04/07/2018 23:59	11.17	26.95	18.9	0.34	0.748	0.42	0.01017284	0.02279139	0.01665936	0.0
05/07/2018 23:59	13.79	20.1	16.64	0.374	100	8.72	0.009363174	0.02261734	0.01351178	0.0
06/07/2018 23:59	12.77	19.05	15.1	0.374	0.748	0.419	0.009118557	0.03197145	0.01875439	0.0
07/07/2018 23:59	11.7	19.86	15.17	0.34	0.748	0.422	0.009977579	0.02361274	0.016291	0.0
08/07/2018 23:59	10.79	23.49	16.77	0.34	66.03	0.467	0.007648468	0.02789378	0.01601276	0.0
09/07/2018 23:59	11.5	24.31	16.53	0.34	87.5	0.521	0.007648468	0.02916408	0.0158419	0.0
10/07/2018 23:59	12.37	23.37	17.28	0.34	0.748	0.419	0.00677228	0.03082299	0.01570125	0.0
11/07/2018 23:59	10.79	27.92	19.2	0.34	100	1.767	0.007762909	0.02366781	0.01521277	0.0
12/07/2018 23:59	12.28	28.96	20.02	0.374	100	5.719	0.006249428	0.02161145	0.01465037	0.0
13/07/2018 23:59	12.35	28.77	20.16	0.374	100	11.2	0.009112835	0.02524734	0.0161688	0.0
14/07/2018 23:59	11.37	30.78	20.86	0.374	100	6.733	0.009112835	0.0261693	0.01656741	0.0
15/07/2018 23:59	13.9	32.4	22.78	0.374	100	11.4	0.008522272	0.02486777	0.01608087	0.0
16/07/2018 23:59	13.93	33.01	23.33	0.407	100	23.26	0.006692171	0.02516127	0.01572043	0.0
17/07/2018 23:59	15.55	32.4	23.27	0.407	100	27.4	0.008862257	0.02603245	0.01624567	0.0
18/07/2018 23:59	15.72	26.94	21.38	0.407	100	36.26	0.007389784	0.02541947	0.01642984	0.0
19/07/2018 23:59	14.56	24.44	18.57	0.407	100	30.57	0.009294271	0.02625418	0.01769423	0.0
20/07/2018 23:59	10.18	20.74	16.23	0.374	100	34.71	0.007013559	0.02572584	0.01823168	0.0
21/07/2018 23:59	10.19	26.34	18.18	0.34	100	25.66	0.004639149	0.02186489	0.0133761	0.0
22/07/2018 23:59	12.45	30.82	21.25	0.407	100	27.39	0.007279873	0.02552557	0.01378396	0.0
23/07/2018 23:59	15.28	31.33	22.75	0.407	100	7.376	0.007610083	0.01799059	0.01327612	0.0
24/07/2018 23:59	15.35	33.03	23.65	0.407	100	9.26	0.007795095	0.01779866	0.01275752	0.0
25/07/2018 23:59	16.57	33.05	24.31	0.407	100	23.02	0.006230354	0.02223825	0.01369101	0.0
26/07/2018 23:59	15.69	33.04	24.07	0.407	100	20.93	0.009445906	0.02310014	0.01633875	0.0
27/07/2018 23:59	17.17	34.69	23.67	0.408	100	54.72	0.006489754	0.02305937	0.01353411	0.0
28/07/2018 23:59	16.56	35.51	25.24	0.407	100	43.14	0.007973433	0.02364874	0.01354726	0.0
29/07/2018 23:59	17.71	36.23	26.32	16.82	64.85	37.9	0.007499933	0.02590084	0.01481784	0.0
30/07/2018 23:59	18.93	36.76	27.15	14.86	62.43	37.47	0.006427288	0.02653265	0.01492908	0.0
31/07/2018 23:59	18.39	33.45	24.97	24.5	64.77	44.45	0.006435871	0.02653265	0.01505208	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/08/2018 23:59	16.56	29.98	21.81	27.22	78.25	56.56	0.008043051	0.0233233	0.01423707	0.0
02/08/2018 23:59	16.28	24.17	18.91	43.49	74.49	61.97	0.01033354	0.02457786	0.01534147	0.0
03/08/2018 23:59	14.67	24.51	19.34	40.47	71.45	56.49	0.009130239	0.02466679	0.01653793	0.0
04/08/2018 23:59	12.88	27.98	20.11	27.16	75.97	51.54	0.008010864	0.02360845	0.01456899	0.0
05/08/2018 23:59	13.93	30.05	22.13	24.06	76.92	48.56	0.005976439	0.01950192	0.01360479	0.0
06/08/2018 23:59	15.79	31.39	23.47	20.36	75.13	45.74	0.0071702	0.0269711	0.01347302	0.0
07/08/2018 23:59	16.26	33.95	24.7	20.36	71.56	43.5	0.008054733	0.02366924	0.01374148	0.0
08/08/2018 23:59	17.3	35.1	25.61	17.3	68.52	41.07	0.009703398	0.02074265	0.01416237	0.0
09/08/2018 23:59	17.41	33.81	25.48	12.89	62.12	36.51	0.01016545	0.01981211	0.01479118	0.0
10/08/2018 23:59	16.06	33.69	23.86	14.79	57.11	37.71	0.008579731	0.02286458	0.01608173	0.0
11/08/2018 23:59	14.26	23.98	18.03	0.374	100	45.61	0.01103449	0.02580309	0.01877997	0.0
12/08/2018 23:59	12.04	21.19	16.38	0.34	10.33	0.427	0.005123615	0.01743197	0.01144092	0.0
13/08/2018 23:59	14.5	27.02	19.5	0.374	64.3	0.698	0.007455111	0.01953268	0.01285738	0.0
14/08/2018 23:59	13.73	31.53	21.45	0.374	100	34.28	0.006163836	0.01961899	0.01365469	0.0
15/08/2018 23:59	14.54	31.96	21.96	0.408	100	56.06	0.006722689	0.02339721	0.01443106	0.0
16/08/2018 23:59	14.54	28.57	20.74	0.408	100	62.17	0.005479813	0.02077341	0.01508377	0.0
17/08/2018 23:59	12.95	28.39	19.81	19.07	100	56.57	0.008446217	0.01965642	0.01304244	0.0
18/08/2018 23:59	12.01	27.42	19.45	27.6	71.43	50.54	0.008806944	0.02166033	0.0121118	0.0
19/08/2018 23:59	13.19	27.96	19.97	30.01	75.23	53.61	0.007712126	0.01422024	0.01161708	0.0
20/08/2018 23:59	13.19	28.13	20.07	23.01	74.74	49.21	0.009485245	0.01550698	0.01242845	0.0
21/08/2018 23:59	14.23	33.72	22.74	14.59	58.93	34.53	0.008115768	0.01678658	0.0120329	0.0
22/08/2018 23:59	15.58	29.71	21.58	25.66	60.04	41.6	0.009456635	0.01928759	0.01308508	0.0
23/08/2018 23:59	13.49	22.22	17.41	41.98	77.96	60.74	0.009770393	0.01993537	0.01343862	0.0
24/08/2018 23:59	9.85	23.03	16.08	31.19	75.26	55.46	0.009118319	0.01790857	0.01291279	0.0
25/08/2018 23:59	12.57	16.69	14.6	0.374	100	18.96	0.01214719	0.02266717	0.01624913	0.0
26/08/2018 23:59	11.46	20.3	15.64	0.34	100	12.24	0.008823395	0.02321506	0.01551138	0.0
27/08/2018 23:59	9.54	27.58	17.84	0.34	100	23.9	0.009419918	0.02121472	0.01581022	0.0
28/08/2018 23:59	10.86	27.29	18.45	0.408	100	55.52	0.009559393	0.02431679	0.01517806	0.0
29/08/2018 23:59	14.36	23.16	18.44478261	0.411	96.8	38.1913913				0.0
30/08/2018 23:59	12.75	22.58	16.94	0.408	100	65.19	0.0084548	0.02029252	0.01340668	0.0
31/08/2018 23:59	10.55	22.73	16.28	0.374	100	61.34	0.003507376	0.02867389	0.01478841	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/09/2018 23:59	8.96	22.86	15.87	0.408	100	62.96	0.007680416	0.02644348	0.01731866	0.0
02/09/2018 23:59	10.65	20.74	14.97	0.374	100	67.13	0.006692648	0.04458737	0.01843793	0.0
03/09/2018 23:59	9.5	21.68	14.62	0.34	100	5.44	0.01041842	0.02376604	0.0154722	0.0
04/09/2018 23:59	8.15	25.4	16.06	0.306	100	4.415	0.01162362	0.02490735	0.01715101	0.0
05/09/2018 23:59	9.47	28.15	18.76	0.374	100	39.96	0.008999586	0.02044773	0.0142026	0.0
06/09/2018 23:59	13.9	27.7	20.12	0.408	100	43.93	0.01092339	0.02214575	0.01663009	0.0
07/09/2018 23:59	12.3	17.44	14.62	0.374	100	14.35	0.006284475	0.0168829	0.01302208	0.0
08/09/2018 23:59	11.39	15.35	12.57	0.374	0.748	0.419	0.004703522	0.0206058	0.01183331	0.0
09/09/2018 23:59	10.82	17.94	12.79	0.34	0.748	0.422	0.01013899	0.02904391	0.01705914	0.0
10/09/2018 23:59	10.65	13.22	11.66	0.34	0.782	0.418	0.009763241	0.02570057	0.01990038	0.0
11/09/2018 23:59	10.25	16.64	11.88	0.34	0.748	0.42	0.0112977	0.02326369	0.01851477	0.0
12/09/2018 23:59	10.62	16.57	12.18	0.34	0.782	0.423	0.01287675	0.02140117	0.01746982	0.0
13/09/2018 23:59	8.86	16.64	12.12	0.34	0.749	0.418	0.007730961	0.0229547	0.01529028	0.0
14/09/2018 23:59	8.35	11.77	9.68	0.306	0.749	0.415	0.01332474	0.02638197	0.01973266	0.0
15/09/2018 23:59	8.32	13.56	9.9	0.306	0.783	0.414	0.01128316	0.02564263	0.02112251	0.0
16/09/2018 23:59	7.907	13.65	9.99	0.272	0.783	0.412	0.008480549	0.02260971	0.01508968	0.0
17/09/2018 23:59	6.188	15.35	10.14	0.272	0.782	0.412	0.01101017	0.01959467	0.01404484	0.0
18/09/2018 23:59	4.842	19.35	10.84	0.306	0.749	0.409	0.005851269	0.01998281	0.01365721	0.0
19/09/2018 23:59	7.908	11.9	10.01	0.306	0.749	0.412	0.0131042	0.0261898	0.01859691	0.0
20/09/2018 23:59	7.371	10.55	9.06	0.306	0.749	0.409	0.005054951	0.0288527	0.01840134	0.0
21/09/2018 23:59	8.96	12.82	10.43	0.306	0.748	0.415	0.005054951	0.02528358	0.01693114	0.0
22/09/2018 23:59	9.2	13.93	11.7	0.34	0.748	0.42	0.01395965	0.02344537	0.01764056	0.0
23/09/2018 23:59	8.08	17.13	11.15	0.306	0.783	0.416	0.009141445	0.02100134	0.01442121	0.0
24/09/2018 23:59	6.528	19.32	11.8	0.272	0.749	0.413	0.003480673	0.02446795	0.01343454	0.0
25/09/2018 23:59	8.01	18.98	12.34	0.306	0.749	0.417	-0.005157471	0.019135	0.01362555	0.0
26/09/2018 23:59	7.002	21.06	12.58	0.306	0.749	0.413	-0.01687074	0.02866268	0.004595684	0.0
27/09/2018 23:59	8.56	22.74	14.18	0.34	0.782	0.415	-0.02479315	0.02128053	0.001112241	0.0
28/09/2018 23:59	9.4	22.88	14.71	0.34	0.715	0.42	-0.02157664	0.02084303	0.006406456	0.0
29/09/2018 23:59	8.42	21.29	13.46	0.272	0.783	0.415	-0.006886721	0.02326202	0.01037072	0.0
30/09/2018 23:59	9.84	14.92	10.99	0.34	0.748	0.418	0.000845909	0.02326202	0.0137305	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/10/2018 23:59	9.47	12.78	10.97	0.306	0.748	0.415	-0.006155968	0.02988744	0.01340406	0.0
02/10/2018 23:59	2.711	11.94	8.41	0.272	0.749	0.407	-0.00220561	0.02189088	0.01284853	0.0
03/10/2018 23:59	1.349	9.27	4.981	0.272	0.749	0.386	0.008228779	0.02348661	0.01408505	0.0
04/10/2018 23:59	4.771	14.15	8.16	0.272	0.783	0.403	0.00773716	0.02608061	0.01313394	0.0
05/10/2018 23:59	5.916	9.4	7.178	0.272	0.749	0.398	0.007580757	0.02222967	0.01665765	0.0
06/10/2018 23:59	3.106	13.86	8.27	0.272	0.749	0.402	-0.00660181	0.02555418	0.01412246	0.0
07/10/2018 23:59	7.908	10.21	8.89	0.306	0.783	0.408	0.01280928	0.02656388	0.02059292	0.0
08/10/2018 23:59	8.35	11.29	9.41	0.306	0.783	0.412	0.01116848	0.02377653	0.01783789	0.0
09/10/2018 23:59	5.211	15.01	9.33	0.272	0.749	0.409	0.007404804	0.02485442	0.01543525	0.0
10/10/2018 23:59	4.671	13.99	8.02	0.272	0.783	0.402	-0.009395838	0.01815414	0.01018532	0.0
11/10/2018 23:59	4.467	15.01	9.23	0.272	0.749	0.406	-0.01594305	0.0255177	0.009812349	0.0
12/10/2018 23:59	5.413	16.48	10.51	0.306	0.748	0.411	0.008140564	0.02331042	0.01416695	0.0
13/10/2018 23:59	2.844	15.1	7.85	0.272	0.749	0.397	0.01152158	0.02578259	0.01797731	0.0
14/10/2018 23:59	3.042	15.75	8.22	0.272	0.783	0.396	0.009953976	0.02413082	0.01625215	0.0
15/10/2018 23:59	3.854	17.01	9.09	0.272	0.783	0.403	0.005203009	0.01924109	0.01280175	0.0
16/10/2018 23:59	5.352	18.64	10.25	0.272	0.749	0.403	0.005056381	0.01872039	0.01060495	0.0
17/10/2018 23:59	4.978	17.37	10.05	0.272	0.749	0.407	0.001558304	0.01890779	0.01012511	0.0
18/10/2018 23:59	5.542	16.65	9.95	0.272	0.748	0.405	0.003817797	0.01647425	0.009852413	0.0
19/10/2018 23:59	4.229	16.01	9.14	0.272	0.749	0.404	0.003530264	0.02164745	0.009911267	0.0
20/10/2018 23:59	5.25	16.29	9.27	0.272	0.749	0.404	0.003934145	0.01913214	0.009776342	0.0
21/10/2018 23:59	3.52	16.04	8.55	0.272	0.749	0.402	0.003954172	0.01958156	0.01082393	0.0
22/10/2018 23:59	4.774	16.11	8.38	0.272	0.749	0.4	0.001737833	0.01955748	0.008866223	0.0
23/10/2018 23:59	2.969	13.83	7.567	0.272	0.783	0.396	0.00276804	0.01943922	0.01218523	0.0
24/10/2018 23:59	5.609	10.63	7.882	0.272	0.783	0.401	0.004669189	0.02145457	0.01471493	0.0
25/10/2018 23:59	7.711	10.96	9.1	0.306	0.749	0.411	0.007771254	0.02148485	0.01711167	0.0
26/10/2018 23:59	5.011	13.73	9.34	0.272	0.749	0.409	0.00961566	0.02283287	0.01690617	0.0
27/10/2018 23:59	1.86	10.87	5.198	0.272	0.749	0.387	-0.000491619	0.02228618	0.01317911	0.0
28/10/2018 23:59	4.876	8.93	7.147	0.272	0.749	0.401	-0.3728187	0.01832676	-0.003431008	0.0
29/10/2018 23:59	4.978	10.48	6.937	0.272	0.783	0.398	-0.008635759	0.01867104	0.005736124	0.0
30/10/2018 23:59	3.888	8.18	6.312	0.272	0.749	0.395	-0.02559853	0.01791835	-0.003489569	0.0
31/10/2018 23:59	6.528	10.62	7.942	0.272	0.749	0.405	-0.0113039	0.01892209	0.000970236	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/11/2018 23:59	8.38	12.65	10.26	0.306	0.749	0.416	-0.02175784	2.14	0.26297	0.0
02/11/2018 23:59	7.812	13.64	10.51	0.272	0.783	0.415	-0.01934075	2.14	0.09562781	1.7
03/11/2018 23:59	7.711	10.97	9.16	0.306	0.783	0.409	-0.009376049	0.01663613	0.003835025	1.0
04/11/2018 23:59	7.372	12.32	9.12	0.306	0.783	0.412	-0.009376049	0.02213001	0.01409122	0.0
05/11/2018 23:59	5.01	9.54	7.193	0.272	0.783	0.4	-0.01095748	0.0200491	0.01137761	0.0
06/11/2018 23:59	2.166	8.45	4.556	0.272	0.749	0.381	-0.03263426	2.14	0.2641684	0.0
07/11/2018 23:59	0.709	8.09	3.228	0.272	0.783	0.373	-0.0177083	0.02009392	0.003070375	2.6
08/11/2018 23:59	-0.511	6.056	2.373	0.272	0.75	0.369	-0.0255127	2.14	0.3567238	0.0
09/11/2018 23:59	1.757	6.965	4.776	0.272	0.783	0.387	-0.003183603	0.01828837	0.01057982	3.6
10/11/2018 23:59	0.068	5.352	2.639	0.272	0.75	0.38	-0.01288414	0.01833844	0.003758846	0.0
11/11/2018 23:59	1.042	4.057	2.351	0.272	0.783	0.372	0.01042104	0.01831985	0.01343433	0.0
12/11/2018 23:59	-0.341	5.352	1.888	0.272	0.749	0.364	-0.002065897	0.01707649	0.008066094	0.0
13/11/2018 23:59	-0.072	7.345	3.317	0.272	0.749	0.374	-0.02330804	0.01095915	-0.004391101	0.0
14/11/2018 23:59	4.935	9.62	6.832	0.272	0.749	0.401	-0.01383948	0.01890445	0.000174319	0.0
15/11/2018 23:59	5.916	10.15	8.1	0.272	0.783	0.401	-0.01402903	2.14	0.359463	0.0
16/11/2018 23:59	5.202	8.59	6.907	0.272	0.783	0.4	-0.01178122	2.14	0.1816998	1.8
17/11/2018 23:59	0.102	5.306	2.271	0.272	0.749	0.361	-0.02131605	2.14	0.8941646	0.0
18/11/2018 23:59	-0.613	4.04	1.223	0.272	0.75	0.353	2.14	2.14	2.14	0.0
19/11/2018 23:59	-0.375	1.465	0.475	0.272	0.716	0.355	2.14	2.14	2.14	0.0
20/11/2018 23:59	0.132	3.071	1.658	0.272	0.749	0.363	-0.01429105	2.14	1.428275	7.1
21/11/2018 23:59	0.974	7.448	4.08	0.272	0.749	0.376	-0.03480005	2.14	1.601606	0.0
22/11/2018 23:59	-0.375	3.888	1.796	0.272	0.749	0.361	2.14	2.14	2.14	0.0
23/11/2018 23:59	0.034	6.869	3.494	0.272	0.749	0.372	-0.02900624	2.14	1.07241	10.7
24/11/2018 23:59	-0.613	3.152	1.354	0.272	0.75	0.36	-0.04567218	2.14	1.057332	0.2
25/11/2018 23:59	2.527	4.842	3.847	0.272	0.749	0.376	-0.043576	2.14	1.51193	0.0
26/11/2018 23:59	3.99	8.53	5.47	0.272	0.783	0.388	-0.03698301	2.14	1.509575	0.0
27/11/2018 23:59	4.841	7.924	6.655	0.272	0.715	0.395	-0.02603745	2.14	1.692099	0.0
28/11/2018 23:59	3.003	6.529	4.831	0.272	0.749	0.383	-0.02247	2.14	1.781387	0.0
29/11/2018 23:59	1.996	5.95	4.253	0.272	0.783	0.38	-0.01363611	2.14	1.518196	2.6
30/11/2018 23:59	0.974	3.65	2.666	0.272	0.715	0.371	-0.01586604	2.14	1.692483	0.0

DAILY WEATHER DATA

Date	Min Air Temp	Max Air Temp	Avg Air Temp	Min Relative Humidity	Max RH	Avg RH	Min Snow Depth	Max Snow Depth	Avg Snow Depth	Snow Rainfall equivalent
(real date)	Deg C	Deg C	Deg C	%	%	%	m	m	m	mm
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Tot
01/12/2018 23:59	1.042	3.922	2.426	0.272	0.749	0.362	-0.01292515	2.14	1.784156	0.0
02/12/2018 23:59	-1.056	2.439	0.955	0.272	0.749	0.352	-0.01462555	2.14	2.050224	0.0
03/12/2018 23:59	-2.449	-0.102	-1.302	0.273	0.716	0.337	2.14	2.14	2.14	0.0
04/12/2018 23:59	-3.595	-0.647	-1.933	0.273	0.716	0.337	-0.02402449	2.14	0.6165239	15.2
05/12/2018 23:59	-4.269	-0.804	-3.09	0.273	0.75	0.327	-0.001105547	2.14	1.163007	0.0
06/12/2018 23:59	-4.814	-1.145	-3.355	0.273	0.75	0.323	2.14	2.14	2.14	0.0
07/12/2018 23:59	-3.292	-0.375	-1.486	0.273	0.716	0.339	-0.003977299	2.14	2.050668	0.9
08/12/2018 23:59	-0.784	1.113	0.075	0.272	0.749	0.349	2.14	2.14	2.14	0.0
09/12/2018 23:59	0.128	4.332	1.862	0.272	0.783	0.362	2.14	2.14	2.14	0.0
10/12/2018 23:59	0.94	4.331	2.636	0.272	0.783	0.361	2.14	2.14	2.14	0.0
11/12/2018 23:59	1.281	7.251	3.748	0.272	0.749	0.364	-0.00765729	2.14	1.961464	1.8
12/12/2018 23:59	0.463	4.278	1.827	0.272	0.749	0.358	-0.01483536	2.14	1.960495	0.0
13/12/2018 23:59	2.166	8.5	3.776	0.272	0.749	0.369	2.14	2.14	2.14	0.0
14/12/2018 23:59	0.293	7.723	3.999	0.272	0.749	0.373	-0.00963068	2.14	1.961173	1.8
15/12/2018 23:59	0.477	4.64	2.168	0.272	0.749	0.355	2.14	2.14	2.14	0.0
16/12/2018 23:59	-0.008	4.365	1.755	0.272	0.783	0.362	2.14	2.14	2.14	0.0
17/12/2018 23:59	1.519	5.25	3.551	0.272	0.749	0.371	0.000134468	2.14	1.694789	4.5
18/12/2018 23:59	1.213	3.99	2.786	0.272	0.783	0.365	2.14	2.14	2.14	0.0
19/12/2018 23:59	1.757	5.215	3.584	0.272	0.715	0.368	2.14	2.14	2.14	0.0
20/12/2018 23:59	-0.07	4.823	1.211	0.272	0.715	0.355	-0.005797148	2.14	2.047625	0.9
21/12/2018 23:59	-1.325	1.738	0.094	0.272	0.682	0.344	-0.009276628	2.14	1.875555	1.7
22/12/2018 23:59	-0.069	0.575	0.157	0.273	0.783	0.349	2.14	2.14	2.14	0.0
23/12/2018 23:59	0.102	3.324	1.39	0.272	0.749	0.35	-0.000701904	2.14	1.785069	3.5
24/12/2018 23:59	-0.375	2.166	0.891	0.272	0.75	0.35	-0.0152297	2.14	1.87315	0.0
25/12/2018 23:59	-1.692	0.578	-0.545	0.273	0.75	0.337	2.14	2.14	2.14	0.0
26/12/2018 23:59	-1.261	1.553	0.261	0.272	0.75	0.344	0.1197834	2.14	1.971899	1.7
27/12/2018 23:59	-1.999	1.519	-0.301	0.272	0.716	0.338	0.09962487	2.14	1.970136	0.0
28/12/2018 23:59	-0.038	0.806	0.293	0.272	0.749	0.343	0.07073593	2.14	1.451818	5.2
29/12/2018 23:59	0.33	8.46	3.907	0.272	0.783	0.367	0.03771043	2.14	1.791944	0.0
30/12/2018 23:59	-1.833	2.268	-0.138	0.272	0.75	0.341	2.14	2.14	2.14	0.0
31/12/2018 23:59	-2.272	0.954	-0.558	0.273	0.716	0.334	2.14	2.14	2.14	0.0

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/01/2018 23:59	0								
02/01/2018 23:59	0								
03/01/2018 23:59	0								
04/01/2018 23:59									
05/01/2018 23:59	12.1	12.1	12.1	0	2.176	0.441	290.9	46.42	0.127
06/01/2018 23:59	9.1	9.1	21.2	0	2.788	0.62	293.5	51.17	-0.643
07/01/2018 23:59	10.7	16.4	37.6	0	1.994	0.66	287	47.78	0.308
08/01/2018 23:59	10.2	10.2	47.8	0	1.999	0.435	284.5	54.42	0.421
09/01/2018 23:59	3.5	6.7	54.6	0	1.64	0.266	284.2	25.7	-4.067
10/01/2018 23:59	6	9.3	63.9	0	1.686	0.426	293.5	50.19	-0.375
11/01/2018 23:59	4	8.9	72.8	0	2.77	0.527	356.3	57.62	-0.57
12/01/2018 23:59	5.7	9.9	82.7	0	1.986	0.395	292.3	68.01	0.284
13/01/2018 23:59	1.9	2.1	84.8	0	1.338	0.323	290.1	62.95	0.61
14/01/2018 23:59	0.1	0.2	85.0	0	1.962	0.424	276.3	55.71	-0.043
15/01/2018 23:59	11.3	11.5	96.5	0	3.276	0.576	286.9	69.24	0.839
16/01/2018 23:59	37.3	37.8	134.3	0	1.991	0.732	288.1	55.37	0.479
17/01/2018 23:59	89.8	90.1	224.4	0	7.6	1.143	322.5	77.93	0.013
18/01/2018 23:59	70.3	70.6	295.0	0	8.82	1.335	297.3	67.59	-1.181
19/01/2018 23:59	32.3	32.3	327.3	0	1.811	0.527	273.4	37.49	-1.582
20/01/2018 23:59	45.6	45.6	372.9	0	1.878	0.436	278.5	31.52	-0.482
21/01/2018 23:59	89.2	89.2	462.1	0	4.858	0.622	290.9	44.05	-3.962
22/01/2018 23:59	14.9	14.9	477.0	0	1.908	0.617	286.2	45.4	-0.643
23/01/2018 23:59	19	19.1	496.0	0	2.561	0.632	315.9	76.28	-0.327
24/01/2018 23:59	8.1	8.1	504.1	0	2.341	0.618	279	36.74	-1.28
25/01/2018 23:59	0.2	0.2	504.3	0	2.037	0.336	301.2	39.63	-2.27
26/01/2018 23:59	0.2	0.2	504.5	0	4.426	0.547	308.9	28.29	-0.516
27/01/2018 23:59	0.4	0.4	504.9	0	4.222	1.129	334.9	47.02	-1.546
28/01/2018 23:59	45.5	45.7	550.6	0	2.775	0.441	289.3	56.66	-1.537
29/01/2018 23:59	53.9	55.4	606.0	0	4.021	1.069	299.8	42.37	0.258
30/01/2018 23:59	17.7	18.1	624.1	0	3.04	0.547	302.2	61.48	-2.381
31/01/2018 23:59	3	3.0	627.1	0	1.184	0.253	285	33.63	-1.583

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/02/2018 23:59	9.6	9.6	636.7	0	1.875	0.17	326.8	47.17	-2.166
02/02/2018 23:59	11.2	11.3	648.0	0	3.6	0.772	293.6	52.15	1.134
03/02/2018 23:59	18.1	18.4	666.4	0	2.14	0.636	292.7	51.98	0.597
04/02/2018 23:59	5.2	5.9	672.3	0	5.13	1.757	278.5	33.05	1.217
05/02/2018 23:59	0	0.8	673.1	0	3.187	0.97	277.4	52.4	0.304
06/02/2018 23:59	4.8	4.9	678.0	0	1.676	0.455	282.5	59.16	0.873
07/02/2018 23:59	6.6	6.8	684.8	0	5.65	1.155	294.8	56.86	0.465
08/02/2018 23:59	2.3	2.3	687.1	0	3.931	1.071	277.4	41.61	-0.352
09/02/2018 23:59	0.1	0.1	687.2	0	1.638	0.438	258.7	36.29	0.257
10/02/2018 23:59	0.1	7.3	694.5	0	2.969	0.628	277.9	70.9	0.902
11/02/2018 23:59	0	2.7	697.1	0	1.867	0.568	258.9	58.68	1.2
12/02/2018 23:59	0	3.4	700.5	0	2.76	0.585	264.4	51.42	0.037
13/02/2018 23:59	8	8.0	708.5	0	2.783	0.74	288.4	81.3	1.36
14/02/2018 23:59	0.4	0.4	708.9	0	1.774	0.606	248.1	46.94	1.894
15/02/2018 23:59	0.7	0.7	709.6	0	2.068	0.478	253.4	59.75	1.436
16/02/2018 23:59	2.3	5.8	715.4	0	4.175	0.906	271.4	55.97	4.438
17/02/2018 23:59	15.2	15.2	730.6	0	4.666	0.907	270.4	49.32	-0.494
18/02/2018 23:59	0.1	6.3	736.9	0	7.603	3.042	104.9	47.03	0.897
19/02/2018 23:59	0	0.8	737.7	0	2.938	0.752	237.9	55.86	1.707
20/02/2018 23:59	0	0.0	737.8	0	5.04	1.24	112.8	50.34	1.779
21/02/2018 23:59	0.9	0.9	738.7	0	3.897	0.994	56.32	45.62	-1.409
22/02/2018 23:59	0.2	0.2	738.9	0	1.834	0.717	261.5	34.29	2.424
23/02/2018 23:59	4.1	4.1	743.0	0	2.906	0.641	296.2	58.18	-1.292
24/02/2018 23:59	6	6.0	749.0	0	3.36	0.635	275.7	44.98	1.909
25/02/2018 23:59	5.4	12.5	761.4	0	4.239	1.104	277.7	41.69	-2.422
26/02/2018 23:59	0.1	0.1	761.5	0	2.703	0.701	258.4	35.11	3.74
27/02/2018 23:59	0.6	0.6	762.1	0	4.051	0.979	266.9	39.92	2.967
28/02/2018 23:59	8.9	8.9	771.0	0	1.792	0.376	271.6	40.12	-0.487

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/03/2018 23:59	7.8	7.8	778.8	0	1.955	0.278	260.8	48.49	-1.062
02/03/2018 23:59	2.4	12.2	791.0	0	1.553	0.308	252.5	55.41	-0.759
03/03/2018 23:59	0	0.0	791.0	0	1.622	0.593	238.4	38.28	6.159
04/03/2018 23:59	0	5.4	796.4	0	4.258	1.008	270.7	54.71	3.809
05/03/2018 23:59	0	0.0	796.4	0	2.747	0.638	262.5	50.36	2.49
06/03/2018 23:59	0.4	0.4	796.9	0	2.757	0.627	151.5	46.82	4.094
07/03/2018 23:59	0	0.2	797.1	0	4.274	0.825	247	47.62	4.713
08/03/2018 23:59	8.9	8.9	806.0	0	4.466	0.56	228.8	48.65	0.123
09/03/2018 23:59	0	0.1	806.0	0	3.226	0.893	253.4	49.48	4.613
10/03/2018 23:59	0	0.2	806.3	0	2.478	0.721	231.5	46	5.991
11/03/2018 23:59		0.0	806.3						
12/03/2018 23:59	0.1	0.1	806.4	0	1.787	0.632	249.6	57.94	5.402
13/03/2018 23:59	6.3	6.3	812.7	0	3.01	0.691	289	68.33	0.191
14/03/2018 23:59	4.3	4.3	817.0	0	4.593	1.155	267.1	37.7	4.778
15/03/2018 23:59	0	0.0	817.0	0	5.374	1.581	218.8	58.27	8.22
16/03/2018 23:59	0	0.2	817.2	0	1.568	0.588	238.8	46.22	7.025
17/03/2018 23:59	0	0.0	817.2	0	3.984	0.838	259.7	65.16	4.12
18/03/2018 23:59	0	0.0	817.2	0	3.247	0.715	233.8	56.02	3.852
19/03/2018 23:59	0	0.0	817.2	0	4.74	0.988	256.2	64.47	7.624
20/03/2018 23:59	0	0.2	817.4	0	4.043	0.92	253.5	47.62	6.948
21/03/2018 23:59	1.6	1.6	819.0	0	6.174	0.968	265.9	58.79	2.538
22/03/2018 23:59	5.3	5.3	824.3	0	3.879	0.869	263.2	40.31	2.244
23/03/2018 23:59	10.5	10.5	834.8	0	3.477	0.418	268.5	53.67	-0.782
24/03/2018 23:59	2.7	5.6	840.5	0	5.405	0.855	247.4	64.35	6.874
25/03/2018 23:59	4.9	5.1	845.6	0	4.185	0.934	264.2	53.83	4.124
26/03/2018 23:59	8.9	8.9	854.5	0	2.158	0.552	286.1	53.82	2.453
27/03/2018 23:59	7.5	7.8	862.3	0	5.129	1.445	270.5	46.19	6.977
28/03/2018 23:59	0	0.0	862.3	0	4.697	1.107	264.5	57.45	6.953
29/03/2018 23:59	3.3	3.3	865.6	0	2.708	0.816	271	50.59	2.333
30/03/2018 23:59	0.3	0.3	865.9	0	4.503	0.931	248.8	56.51	9.02
31/03/2018 23:59	0	0.0	865.9	0	3.915	1.175	258.9	51.34	6.411

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/04/2018 23:59	0.4	0.4	866.3	0	5.388	1.607	270.8	37.03	4.748
02/04/2018 23:59	0.9	0.9	867.2	0	4.596	1.037	255.8	53.27	8.85
03/04/2018 23:59	0.4	0.7	867.8	0	3.374	0.96	264	53.21	2.042
04/04/2018 23:59	9.9	9.9	877.7	0	4.549	1.101	180.8	56.36	1.252
05/04/2018 23:59	30.8	30.8	908.5	0	1.372	0.2	257.9	41.93	-0.384
06/04/2018 23:59	4.3	4.7	913.3	0	5.803	0.722	276.3	70.27	6.959
07/04/2018 23:59	39.4	39.4	952.7	0	2.791	0.688	335.2	63.2	0.983
08/04/2018 23:59	2	2.0	954.7	0	2.285	0.537	253.6	64.07	6.132
09/04/2018 23:59	0.5	0.5	955.2	0	5.49	1.635	313.2	59.54	7.197
10/04/2018 23:59	41.9	41.9	997.1	0	6.156	1.067	281.3	66.29	-0.074
11/04/2018 23:59	40.1	40.1	1037.2	0	2.298	0.623	257.4	41.37	0.866
12/04/2018 23:59	3.5	3.5	1040.8	0	4.449	1.194	266.4	47.4	9.25
13/04/2018 23:59	46.1	46.1	1086.9	0	2.751	0.712	275.9	50.77	-0.356
14/04/2018 23:59	5.7	5.7	1092.6	0	4.17	1.048	262.1	44.78	4.708
15/04/2018 23:59	0.1	0.4	1093.0	0	8.14	1.421	167.2	49.07	10.79
16/04/2018 23:59	0.9	0.9	1093.9	0	3.257	0.608	238.9	62.52	4.135
17/04/2018 23:59	0	0.1	1094.0	0	4.965	1.446	267.5	35.48	7.081
18/04/2018 23:59	0	0.0	1094.0	0	4.248	0.904	229.6	55.34	7.415
19/04/2018 23:59	0	0.0	1094.0	0	3.652	1.125	268.8	44.81	8.39
20/04/2018 23:59	16.5	16.5	1110.5	0	1.877	0.647	269.6	64.37	2.406
21/04/2018 23:59	4.2	4.2	1114.7	0	5.001	1.457	261.9	36.54	11.19
22/04/2018 23:59	0	0.0	1114.7	0	3.339	0.908	241.4	55.84	11.95
23/04/2018 23:59	0	0.0	1114.7	0	5.124	1.358	296.9	45.56	11.9
24/04/2018 23:59	0	0.0	1114.7	0	5.367	1.338	310.5	51.25	11.27
25/04/2018 23:59	0	0.2	1115.0	0	4.547	1.152	266.4	46.96	12.34
26/04/2018 23:59	0	0.0	1115.0	0	3.149	0.823	248.7	52.93	12.12
27/04/2018 23:59	0	0.0	1115.0	0	5.454	1.604	269.1	57.8	13.13
28/04/2018 23:59	3.9	3.9	1118.9	0	3.353	0.854	276.1	65.49	0.6
29/04/2018 23:59	3.3	3.3	1122.2	0	3.726	1.233	120.4	45.72	5.867
30/04/2018 23:59	1.5	1.8	1124.0	0	3.9	0.986	235.6	60.51	12.02

DAILY WEATHER DATA

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(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/05/2018 23:59	0	0.0	1124.0	0	4.043	1.209	67.58	60.66	12.42
02/05/2018 23:59	0	0.0	1124.0	0	4.541	1.375	46.6	52.1	11.75
03/05/2018 23:59	0	0.0	1124.0	0	5.653	1.471	267.5	55.85	12.19
04/05/2018 23:59	0.1	0.3	1124.3	0	4.787	1.388	273.3	65.86	5.32
05/05/2018 23:59	0	0.0	1124.3	0	6.504	1.273	177.6	54.58	13.54
06/05/2018 23:59	0	0.0	1124.3	0	3.994	1.233	257.7	53.41	11.07
07/05/2018 23:59	0	0.3	1124.5	0	5.094	1.358	275.8	53.48	12.69
08/05/2018 23:59	2.4	2.4	1126.9	0	3.776	1.122	285.1	61.3	7.2
09/05/2018 23:59	0.2	0.2	1127.1	0	4.034	1.652	264	25.55	3.212
10/05/2018 23:59	0.7	0.7	1127.8	0	4.312	1.194	246.3	58.5	8.09
11/05/2018 23:59	0	0.0	1127.8	0	4.382	1.265	12.17	43.96	14.6
12/05/2018 23:59	0	0.0	1127.8	0	7.335	1.592	28.2	49.12	14.41
13/05/2018 23:59	0	0.0	1127.8	0	4.07	1.137	277.5	57.72	14.09
14/05/2018 23:59	0	0.0	1127.8	0	4.568	1.326	283.6	46.06	14.28
15/05/2018 23:59	0	0.0	1127.8	0	4.586	1.397	273.3	46	13.65
16/05/2018 23:59	0	0.0	1127.8	0	4.694	1.479	4.862	47.53	11.67
17/05/2018 23:59	0	0.0	1127.8	0	4.916	1.495	279.1	58.99	13.39
18/05/2018 23:59	2.3	2.3	1130.1	0	4.33	1.255	256.3	50.01	12.34
19/05/2018 23:59	1.3	1.3	1131.4	0	3.187	0.75	269.7	69.75	1.742
20/05/2018 23:59	0	0.0	1131.4	0	4.583	1.475	268.3	41.72	8.96
21/05/2018 23:59	0	0.0	1131.4	0	4.662	1.131	248.9	49.25	12.33
22/05/2018 23:59	0	0.0	1131.4	0	4.596	1.41	271.8	44.87	14.74
23/05/2018 23:59	0	0.0	1131.4	0	5.878	1.679	268.3	33.43	15.2
24/05/2018 23:59	0	0.0	1131.4	0	6.432	2.045	275.8	52	13.43
25/05/2018 23:59	0	0.0	1131.4	0	4.622	1.711	274.7	40.58	8.36
26/05/2018 23:59	0	0.0	1131.4	0	4.735	1.47	267.1	47.58	6.883
27/05/2018 23:59	0	0.0	1131.4	0	5.562	2.023	266.9	39	15.78
28/05/2018 23:59	0	0.0	1131.4	0	5.112	1.785	253.2	46.96	14.23
29/05/2018 23:59	0	0.0	1131.4	0	4.784	1.571	41.91	58.25	8.8
30/05/2018 23:59	1	1.0	1132.4	0	4.889	1.222	250.3	41.1	9.3
31/05/2018 23:59	0.1	0.1	1132.5	0	6.47	1.446	263.5	53.09	10.96

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(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/06/2018 23:59	8.2	8.2	1140.7	0	3.94	1.075	261	53.73	2.105
02/06/2018 23:59	5.9	5.9	1146.6	0	4.261	0.92	246.6	52.28	4.348
03/06/2018 23:59	0.4	0.4	1147.0	0	4.222	1.171	268.8	34.43	5.753
04/06/2018 23:59	0.1	0.1	1147.1	0	5.555	1.389	256.9	43.55	11.12
05/06/2018 23:59	15.8	15.8	1162.9	0	3.605	0.736	278.2	65.5	1.992
06/06/2018 23:59	3.3	3.3	1166.2	0	2.785	0.773	266.2	51.49	3.225
07/06/2018 23:59	25.7	25.7	1191.9	0	3.567	0.661	278.2	53.1	1.774
08/06/2018 23:59	43.9	43.9	1235.8	0	2.837	0.599	268.6	62.26	3.369
09/06/2018 23:59	0	0.3	1236.1	0	5.357	1.911	245.6	44.43	11.76
10/06/2018 23:59	4.2	4.2	1240.3	0	5.615	1.195	264.5	64.02	6.198
11/06/2018 23:59	0.1	0.1	1240.4	0	5.111	1.4	265.2	41.86	15.66
12/06/2018 23:59	3.6	3.6	1244.0	0	2.367	0.499	276.2	65.61	0.777
13/06/2018 23:59	5.3	5.3	1249.3	0	3.673	0.967	264.1	52.4	4.375
14/06/2018 23:59	0	0.0	1249.3	0	3.905	1.067	276.9	45.77	8.13
15/06/2018 23:59	0	0.0	1249.3	0	5.313	1.199	69.37	75.56	13.4
16/06/2018 23:59	0	0.0	1249.3	0	5.602	1.667	38.14	49.38	16.02
17/06/2018 23:59	0	0.0	1249.3	0	6.956	1.462	28.69	54.61	13.45
18/06/2018 23:59	0	0.0	1249.3	0	6.951	1.558	346	49.09	15.37
19/06/2018 23:59	0	0.0	1249.3	0	4.103	1.208	347.5	58.32	14.3
20/06/2018 23:59	0	0.0	1249.3	0	5.052	1.39	53.27	64.19	15.53
21/06/2018 23:59	0	0.0	1249.3	0	4.941	1.651	269.4	50.57	15.35
22/06/2018 23:59	0	0.0	1249.3	0	4.853	1.476	232.4	73.17	7.932
23/06/2018 23:59	0	0.0	1249.3	0	5.005	1.611	252.4	55.63	16.07
24/06/2018 23:59	6.1	6.1	1255.4	0	2.809	0.695	288.6	74.85	-0.417
25/06/2018 23:59	1.5	1.5	1256.9	0	4.606	1.096	262.2	37.84	8.37
26/06/2018 23:59	0.1	0.1	1257.0	0	5.328	1.207	20.17	57.78	13.54
27/06/2018 23:59	0	0.0	1257.0	0	5.183	1.505	102	56.25	10.87
28/06/2018 23:59	0.6	0.6	1257.6	0	3.662	0.808	267.8	50.45	2.624
29/06/2018 23:59	4.6	4.6	1262.2	0	4.074	0.969	92.7	50.06	6.723
30/06/2018 23:59	1.2	1.2	1263.4	0	4.474	1.189	272.2	42.98	5.33

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/07/2018 23:59	0	0.0	1263.4	0	5.266	1.8	260.4	50.97	13.09
02/07/2018 23:59	0	0.0	1263.4	0	6.234	1.534	37.35	63.18	12.45
03/07/2018 23:59	0	0.0	1263.4	0	5.138	1.256	275.6	58.85	10.84
04/07/2018 23:59	0	0.0	1263.4	0	6.96	1.417	78.17	55.21	11.75
05/07/2018 23:59	0.8	0.8	1264.2	0	2.871	0.528	333.7	73.43	1.236
06/07/2018 23:59	8.7	8.7	1272.9	0	3.27	0.708	261.7	57.71	4.167
07/07/2018 23:59	0.2	0.2	1273.1	0	4.221	1.01	258.7	44.14	4.448
08/07/2018 23:59	0	0.0	1273.1	0	3.468	1.073	73.17	51.48	11.61
09/07/2018 23:59	0	0.0	1273.1	0	4.301	1.036	281.9	72.41	8.07
10/07/2018 23:59	0	0.0	1273.1	0	4.544	1.108	246.5	70.6	9.72
11/07/2018 23:59	0	0.0	1273.1	0	5.107	1.574	64.89	50.76	15.11
12/07/2018 23:59	0	0.0	1273.1	0	5.067	1.598	84.4	54.22	14.71
13/07/2018 23:59	0	0.0	1273.1	0	5.514	1.735	76.26	54.32	13.91
14/07/2018 23:59	0	0.0	1273.1	0	4.368	1.305	75.39	50.86	13.83
15/07/2018 23:59	0	0.0	1273.1	0	4.817	1.547	55.53	54.22	13.73
16/07/2018 23:59	0	0.0	1273.1	0	5.431	1.529	74.66	51.43	13.68
17/07/2018 23:59	0	0.0	1273.1	0	5.359	1.416	177.4	62.08	13.8
18/07/2018 23:59	0	0.0	1273.1	0	6.891	1.511	231.8	79.71	14.35
19/07/2018 23:59	0	0.0	1273.1	0	6.261	2.073	113.1	45.91	13.6
20/07/2018 23:59	0	0.0	1273.1	0	4.451	1.478	73.88	62.12	5.06
21/07/2018 23:59	0	0.0	1273.1	0	5.994	1.835	77.5	56.16	12.24
22/07/2018 23:59	0	0.0	1273.1	0	4.394	1.094	252.9	49	11.99
23/07/2018 23:59	0	0.0	1273.1	0	4.622	1.004	272.2	35.1	9.27
24/07/2018 23:59	0	0.0	1273.1	0	5.232	1.117	295.7	55.2	10.91
25/07/2018 23:59	0	0.0	1273.1	0	4.47	1.255	269.6	52.79	12.56
26/07/2018 23:59	0	0.0	1273.1	0	4.805	1.167	298.4	52.34	10.72
27/07/2018 23:59	0	0.0	1273.1	0	5.346	1.4	250.6	50.1	10.16
28/07/2018 23:59	0	0.0	1273.1	0	4.573	1.232	261.4	45.04	11.06
29/07/2018 23:59	0	0.0	1273.1	0	4.908	1.112	258.4	51.15	11.45
30/07/2018 23:59	0	0.0	1273.1	0	4.833	1.038	273.7	57.55	9.48
31/07/2018 23:59	0	0.0	1273.1	0	5.263	1.429	241.2	49.52	11.81

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/08/2018 23:59	0	0.0	1273.1	0	5.272	1.611	154.5	55.63	12.27
02/08/2018 23:59	0	0.0	1273.1	0	5.432	1.842	136.8	67.31	10.8
03/08/2018 23:59	0	0.0	1273.1	0	6.478	1.7	148.5	56.97	9.11
04/08/2018 23:59	0	0.0	1273.1	0	4.359	1.204	249.8	42.37	9.64
05/08/2018 23:59	0	0.0	1273.1	0	4.746	1.103	272.1	41.74	10.03
06/08/2018 23:59	0	0.0	1273.1	0	5.516	1.415	257.2	44.71	11.69
07/08/2018 23:59	0	0.0	1273.1	0	4.255	1.115	256.4	46.93	11.68
08/08/2018 23:59	0	0.0	1273.1	0	5.08	1.379	276	49.54	11.13
09/08/2018 23:59	0	0.0	1273.1	0	4.827	1.468	270.5	38.19	10.89
10/08/2018 23:59	0	0.0	1273.1	0	7.33	1.673	269.3	47.43	9.89
11/08/2018 23:59	9.7	9.7	1282.8	0	5.339	1.204	280.5	75.86	3.469
12/08/2018 23:59	0	0.0	1282.8	0	3.649	0.922	175.9	55.01	4.033
13/08/2018 23:59	0	0.0	1282.8	0	3.678	0.847	92.6	45.32	10.08
14/08/2018 23:59	0	0.0	1282.8	0	4.386	0.994	102.3	51.36	8.87
15/08/2018 23:59	0	0.0	1282.8	0	4.346	1.175	229.1	61.93	10.88
16/08/2018 23:59	0	0.0	1282.8	0	5.183	1.489	96.9	46.57	10.85
17/08/2018 23:59	0	0.0	1282.8	0	4.639	1.257	95.2	57.29	10.05
18/08/2018 23:59	0	0.0	1282.8	0	4.176	1.074	128.4	46.42	8.51
19/08/2018 23:59	0	0.0	1282.8	0	3.374	0.624	192.3	48.86	4.763
20/08/2018 23:59	0	0.0	1282.8	0	3.134	0.546	251.9	53.05	2.296
21/08/2018 23:59	0	0.0	1282.8	0	3.597	0.766	253.6	57.75	6.636
22/08/2018 23:59	0	0.0	1282.8	0	3.91	0.878	94.8	45.72	5.348
23/08/2018 23:59	0	0.0	1282.8	0	5.53	1.336	93.5	59.87	5.119
24/08/2018 23:59	0	0.0	1282.8	0	4.722	1.05	267.1	63.9	6.718
25/08/2018 23:59	3.2	3.2	1286.0	0	3.432	0.651	215.2	62.95	-2.743
26/08/2018 23:59	0	0.0	1286.0	0	4.093	1.016	22.09	66.26	2.505
27/08/2018 23:59	0	0.0	1286.0	0	4.627	0.998	227.2	55.26	8.41
28/08/2018 23:59	0	0.0	1286.0	0	3.935	1.125	98.4	64.07	8.37
29/08/2018 23:59	0.1	0.1	1286.1	0.218	3.756				
30/08/2018 23:59	0	0.0	1286.1	0	3.704	1.178	247.1	54.85	3.732
31/08/2018 23:59	0	0.0	1286.1	0	5.811	1.42	260.7	46.44	8.02

DAILY WEATHER DATA

Date	Total Rain	Total Precip	Cumulative	Min Wind Speed	Max Wind Speed	WindSpd_S_W VT	WindDir_D1_WVT	WindDir_SD1_WVT	Net Radiation
(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/09/2018 23:59	0	0.0	1286.1	0	4.541	1.174	134.2	73.29	7.579
02/09/2018 23:59	1.1	1.1	1287.2	0	4.98	1.311	242.5	59.47	3.68
03/09/2018 23:59	0	0.0	1287.2	0	4.472	1.16	69.54	60.63	5.918
04/09/2018 23:59	0	0.0	1287.2	0	3.786	0.909	231.1	41.72	7.885
05/09/2018 23:59	0	0.0	1287.2	0	4.221	1.092	211.1	52.02	8.25
06/09/2018 23:59	0	0.0	1287.2	0	5.274	1.452	268.9	47.98	7.041
07/09/2018 23:59	15.2	15.2	1302.4	0	5.029	0.671	260.9	69.99	-1.14
08/09/2018 23:59	10.5	10.5	1312.9	0	2.261	0.416	280.3	60.17	0.499
09/09/2018 23:59	36.5	36.5	1349.4	0	4.893	0.831	275.9	54.74	1.997
10/09/2018 23:59	47.7	47.7	1397.1	0	1.989	0.393	246.3	64.92	0.572
11/09/2018 23:59	15.2	15.2	1412.3	0	4.263	0.482	105.2	58.85	3.28
12/09/2018 23:59	4.4	4.4	1416.7	0	1.829	0.289	241.9	47.48	2.452
13/09/2018 23:59	0.5	0.5	1417.2	0	3.448	0.668	259.8	48.55	-0.011
14/09/2018 23:59	8	8.0	1425.2	0	2.042	0.367	246.6	48.2	0.115
15/09/2018 23:59	15	15.0	1440.2	0	2.069	0.309	263.4	65.18	0.614
16/09/2018 23:59	11.8	11.8	1452.0	0	4.485	0.77	100	41.41	3.161
17/09/2018 23:59	0.1	0.1	1452.1	0	3.218	0.707	253.2	55.15	4.298
18/09/2018 23:59	0	0.0	1452.1	0	3.263	0.737	245.6	58.33	7.321
19/09/2018 23:59	6.3	6.3	1458.4	0	3.128	0.689	139	45.85	0.08
20/09/2018 23:59	23.9	23.9	1482.3	0	1.597	0.245	249.4	48.38	-0.293
21/09/2018 23:59	47.8	47.8	1530.1	0	2.979	0.365	216.1	61.08	1.138
22/09/2018 23:59	5	5.0	1535.1	0	4.075	0.997	99.3	45.04	1.728
23/09/2018 23:59	0.1	0.1	1535.2	0	2.741	0.519	237.1	44.18	5.109
24/09/2018 23:59	0	0.0	1535.2	0	2.31	0.544	244.2	50.43	6.551
25/09/2018 23:59	0	0.0	1535.2	0	2.69	0.552	237.5	52.93	5.993
26/09/2018 23:59	0	0.0	1535.2	0	2.378	0.528	230	44.75	6.573
27/09/2018 23:59	0	0.0	1535.2	0	2.234	0.497	229.8	50.34	6.274
28/09/2018 23:59	0.1	0.1	1535.3	0	1.504	0.399	247.4	48.78	5.828
29/09/2018 23:59	0	0.0	1535.3	0	4.83	0.63	184	47.5	4.876
30/09/2018 23:59	49.7	49.7	1585.0	0	2.646	0.631	97.2	49.94	-0.204

DAILY WEATHER DATA

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(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/10/2018 23:59	6.4	6.4	1591.4	0	2.677	0.917	100.1	43.99	0.902
02/10/2018 23:59	0.7	0.7	1592.1	0	6.412	1.168	273.8	43.02	1.132
03/10/2018 23:59	0.1	0.1	1592.2	0	3.376	0.662	179	55.49	1.646
04/10/2018 23:59	0	0.0	1592.2	0	2.181	0.554	168.8	51.27	6.05
05/10/2018 23:59	6.6	6.6	1598.8	0	4.345	1.183	63.18	38.62	0.125
06/10/2018 23:59	0	0.0	1598.8	0	2.254	0.406	243.8	42.69	4.177
07/10/2018 23:59	15	15.0	1613.8	0	3.031	0.641	109.6	27.69	0.679
08/10/2018 23:59	1.2	1.2	1615.0	0	2.721	0.392	104.2	26.56	1.784
09/10/2018 23:59	0.1	0.1	1615.1	0	1.72	0.507	252.7	34.93	4.641
10/10/2018 23:59	0	0.0	1615.1	0	2.445	0.381	230.6	44.38	1.962
11/10/2018 23:59	0.1	0.1	1615.2	0	1.803	0.46	244.1	42.79	4.066
12/10/2018 23:59	0	0.0	1615.2	0	2.667	0.617	247.2	55.55	3.67
13/10/2018 23:59	0	0.0	1615.2	0	1.989	0.507	255.2	31.62	2.962
14/10/2018 23:59	0	0.0	1615.2	0	1.434	0.455	259	35.72	2.993
15/10/2018 23:59	0	0.0	1615.2	0	1.315	0.386	256.5	36.76	3.018
16/10/2018 23:59	0	0.0	1615.2	0	1.55	0.423	258.5	35.61	2.958
17/10/2018 23:59	0	0.0	1615.2	0	1.713	0.569	258.9	60.3	2.641
18/10/2018 23:59	0	0.0	1615.2	0	1.56	0.498	256.8	51.73	2.283
19/10/2018 23:59	0	0.0	1615.2	0	2.719	0.56	256.7	53.31	2.036
20/10/2018 23:59	0	0.0	1615.2	0	1.566	0.433	258.1	44.31	1.586
21/10/2018 23:59	0	0.0	1615.2	0	1.129	0.452	265.1	34.31	1.07
22/10/2018 23:59	0	0.0	1615.2	0	1.602	0.453	260.9	36.4	1.097
23/10/2018 23:59	4.4	4.4	1619.6	0	6.228	0.829	320.3	72.02	-0.925
24/10/2018 23:59	20.4	20.4	1640.0	0	2.705	0.541	293.7	61.84	-0.252
25/10/2018 23:59	18.5	18.5	1658.5	0	2.427	0.458	82.7	59.38	2.095
26/10/2018 23:59	12	12.0	1670.5	0	3.659	0.869	272.5	44.08	1.672
27/10/2018 23:59	12.5	12.5	1683.0	0	4.353	0.683	319.6	71.97	-1.786
28/10/2018 23:59	16.8	16.8	1699.8	0	2.71	0.375	286.4	39.66	0.023
29/10/2018 23:59	9.5	9.5	1709.3	0	1.833	0.257	278.3	28.48	0.722
30/10/2018 23:59	11.2	11.2	1720.5	0	1.805	0.161	293.1	33.82	-0.159
31/10/2018 23:59	1.9	1.9	1722.4	0	2.453	0.3	94.7	33.75	2.251

DAILY WEATHER DATA

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(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/11/2018 23:59	54.5	54.5	1776.9	0	1.65	0.206	296.9	49.95	0.575
02/11/2018 23:59	2.2	3.9	1780.8	0	4.232	0.978	273.2	29.8	0.36
03/11/2018 23:59	60	61.0	1841.7	0	1.924	0.49	285.9	36.01	-0.081
04/11/2018 23:59	5.2	5.2	1846.9	0	4.662	0.627	270	30.96	-0.351
05/11/2018 23:59	5.7	5.7	1852.6	0	1.855	0.297	282.5	49.56	-0.455
06/11/2018 23:59	0.2	0.2	1852.8	0	1.967	0.119	281.3	33.5	-1.022
07/11/2018 23:59	0.1	2.7	1855.6	0	1.14	0.055	267.1	13.16	-2.352
08/11/2018 23:59	0.2	0.2	1855.8	0	1.744	0.092	265.1	26.56	-0.833
09/11/2018 23:59	4.4	8.0	1863.8	0	2.666	0.369	72.87	44.25	0.189
10/11/2018 23:59	0.1	0.1	1863.9	0	2.02	0.15	264.5	23.82	-0.018
11/11/2018 23:59	0	0.0	1863.9	0	2.034	0.382	237.6	31.24	1.162
12/11/2018 23:59	0	0.0	1863.9	0	1.901	0.132	263.6	35.01	-1.335
13/11/2018 23:59	35.9	35.9	1899.8	0	2.365	0.387	291.1	50.13	0.006
14/11/2018 23:59	26.2	26.2	1926.0	0	2.95	0.247	290.1	28.81	0.002
15/11/2018 23:59	8.8	8.8	1934.8	0	2.063	0.143	304.2	20.09	0.683
16/11/2018 23:59	0	1.8	1936.5	0	1.529	0.071	51.64	12.58	0.941
17/11/2018 23:59	0.1	0.1	1936.6	0	1.005	0.054	280.1	10.42	-4.234
18/11/2018 23:59	0.3	0.3	1936.9	0	0.768	0.015	271.8	2.105	-3.661
19/11/2018 23:59	0.1	0.1	1937.0	0	2.012	0.079	239.9	24.02	-0.178
20/11/2018 23:59	0	7.1	1944.1	0	1.704	0.162	215.1	37.28	0.758
21/11/2018 23:59	17.5	17.5	1961.6	0	2.582	0.219	301.9	51.02	-0.975
22/11/2018 23:59	19.6	19.6	1981.2	0	2.19	0.135	289.4	36.7	-0.932
23/11/2018 23:59	5.4	16.1	1997.3	0	2.277	0.287	315.7	30.7	0.303
24/11/2018 23:59	3.2	3.4	2000.7	0	1.519	0.073	125	31.97	-0.826
25/11/2018 23:59	27.7	27.7	2028.4	0	1.552	0.086	75.65	34.92	0.234
26/11/2018 23:59	89.1	89.1	2117.5	0	1.901	0.25	347.3	57.44	0.212
27/11/2018 23:59	35.2	35.2	2152.7	0	1.793	0.121	296.5	27.63	0.078
28/11/2018 23:59	4.9	4.9	2157.6	0	1.478	0.07	300.3	24.34	-0.266
29/11/2018 23:59	0.4	3.0	2160.6	0	1.483	0.062	94.3	10.25	0.569
30/11/2018 23:59	0.1	0.1	2160.7	0	0.902	0.011	213.2	8.17	-0.492

DAILY WEATHER DATA

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(real date)	mm	mm	mm	m/s	m/s	meters/second	Deg	Deg	MJ/meter ²
	Tot	Tot	Tot	Min	Max	WVc	WVc	WVc	Tot
01/12/2018 23:59	0	0.0	2160.7	0	0.795	0.009	45.13	2.602	-0.871
02/12/2018 23:59	0.1	0.1	2160.8	0	1.996	0.106	312.2	9.6	-3.023
03/12/2018 23:59	0	0.0	2160.8	0	0.828	0.034	265.6	9.31	-1.627
04/12/2018 23:59	0	15.2	2176.1	0	1.021	0.062	276.9	11.77	-3.961
05/12/2018 23:59	0	0.0	2176.1	0	0	0	0	0	-4.429
06/12/2018 23:59	0	0.0	2176.1	0	1.86	0.106	295.4	18.71	-3.113
07/12/2018 23:59	0	0.9	2177.0	0	1.321	0.089	280.9	14.9	0.065
08/12/2018 23:59	2.9	2.9	2179.9	0	0.508	0.006	254.6	10.39	-1.213
09/12/2018 23:59	54.4	54.4	2234.3	0	1.885	0.164	292.3	34.13	0.884
10/12/2018 23:59	16.8	16.8	2251.1	0	1.248	0.136	290.2	21.04	0.448
11/12/2018 23:59	51	52.8	2303.8	0	4.975	0.9	283.2	34.57	-1.078
12/12/2018 23:59	50.3	50.3	2354.2	0	2.932	0.508	282.7	29.12	-1.393
13/12/2018 23:59	59.4	59.4	2413.6	0	4.838	0.305	311.8	37.59	0.179
14/12/2018 23:59	77.4	79.2	2492.7	0	5.009	0.903	299.7	51.86	-1.909
15/12/2018 23:59	24.6	24.6	2517.3	0	6.014	0.67	5.197	47.8	-1.202
16/12/2018 23:59	72.6	72.6	2589.9	0	2.778	0.488	315.1	32.75	-0.299
17/12/2018 23:59	78.3	82.8	2672.7	0	5.529	0.583	306.7	49.76	-0.523
18/12/2018 23:59	45	45.0	2717.7	0	1.864	0.25	283.5	24.42	-0.301
19/12/2018 23:59	15.1	15.1	2732.8	0	3.299	0.301	294.9	29.31	-0.045
20/12/2018 23:59	70.8	71.7	2804.5	0	5.62	0.92	289.3	42.22	-2.588
21/12/2018 23:59	0.1	1.8	2806.3	0	2.643	0.218	322.4	35.84	-1.383
22/12/2018 23:59	29.1	29.1	2835.4	0	1.566	0.021	49.16	19.57	-0.423
23/12/2018 23:59	25.9	29.4	2864.9	0	1.904	0.216	292.1	21	-1.418
24/12/2018 23:59	2.7	2.7	2867.6	0	0.777	0.012	288.5	4.332	-0.266
25/12/2018 23:59	0	0.0	2867.6	0	1.336	0.026	293.9	6.344	-2.608
26/12/2018 23:59	4.5	6.2	2873.8	0	1.073	0.007	53.05	6.491	-1.578
27/12/2018 23:59	2	2.0	2875.8	0	1.344	0.01	67.65	1.439	-2.215
28/12/2018 23:59	21	26.2	2902.0	0	1.761	0.032	54.73	11.87	-0.735
29/12/2018 23:59	29	29.0	2931.0	0	4.101	0.683	281.9	25.33	0.577
30/12/2018 23:59	0.1	0.1	2931.1	0	1.855	0.128	293.7	29.72	-4.221
31/12/2018 23:59	0.1	0.1	2931.2	0	1.3	0.04	318.3	18.98	-1.687

Appendix C

Laboratory Reports

This appendix included in the digital report only

Appendix D
Daily Data – pH, Flow, Composites, Monthly Tabulated Water Quality
Data

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
JANUARY 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/01/2018	20,483	8.02
MP-EFF-D	02/01/2018	20,920	8.00
MP-EFF-D	03/01/2018	20,237	7.52
MP-EFF-D	04/01/2018	18,682	7.60
MP-EFF-D	05/01/2018	29,960	7.64
MP-EFF-D	06/01/2018	28,701	7.75
MP-EFF-D	07/01/2018	27,753	7.71
MP-EFF-D	08/01/2018	31,039	7.72
MP-EFF-D	09/01/2018	28,472	7.76
MP-EFF-D	10/01/2018	26,406	6.90
MP-EFF-D	11/01/2018	27,165	6.97
MP-EFF-D	12/01/2018	25,663	7.02
MP-EFF-D	13/01/2018	23,529	7.06
MP-EFF-D	14/01/2018	23,125	7.10
MP-EFF-D	15/01/2018	28,051	7.12
MP-EFF-D	16/01/2018	43,287	7.14
MP-EFF-D	17/01/2018	73,840	6.96
MP-EFF-D	18/01/2018	83,635	7.01
MP-EFF-D	19/01/2018	64,348	6.99
MP-EFF-D	20/01/2018	61,218	6.98
MP-EFF-D	21/01/2018	99,886	7.12
MP-EFF-D	22/01/2018	64,437	7.60
MP-EFF-D	23/01/2018	59,976	7.60
MP-EFF-D	24/01/2018	50,783	7.65
MP-EFF-D	25/01/2018	44,183	7.64
MP-EFF-D	26/01/2018	39,433	7.62
MP-EFF-D	27/01/2018	37,116	7.60
MP-EFF-D	28/01/2018	64,397	7.65
MP-EFF-D	29/01/2018	80,153	7.69
MP-EFF-D	30/01/2018	58,275	7.66
MP-EFF-D	31/01/2018	45,059	7.44

<u>Statistics:</u>	Flow	pH
Mean	43,555	7.43
Median	37,116	7.60
Maximum	99,886	8.02
Minimum	18,682	6.90
Running Total	1,350,210	

STATION	DATE	pH-L
MC-TP4-D	01/01/2018	8.27
MC-TP4-D	02/01/2018	8.14
MC-TP4-D	03/01/2018	7.98
MC-TP4-D	04/01/2018	8.05
MC-TP4-D	05/01/2018	8.24
MC-TP4-D	06/01/2018	8.10
MC-TP4-D	07/01/2018	8.00
MC-TP4-D	08/01/2018	7.96
MC-TP4-D	09/01/2018	7.84
MC-TP4-D	10/01/2018	6.69
MC-TP4-D	11/01/2018	6.83
MC-TP4-D	12/01/2018	6.83
MC-TP4-D	13/01/2018	6.86
MC-TP4-D	14/01/2018	6.89
MC-TP4-D	15/01/2018	6.97
MC-TP4-D	16/01/2018	7.01
MC-TP4-D	17/01/2018	7.84
MC-TP4-D	18/01/2018	7.56
MC-TP4-D	19/01/2018	7.56
MC-TP4-D	20/01/2018	7.35
MC-TP4-D	21/01/2018	7.81
MC-TP4-D	22/01/2018	7.57
MC-TP4-D	23/01/2018	7.54
MC-TP4-D	24/01/2018	7.23
MC-TP4-D	25/01/2018	7.44
MC-TP4-D	26/01/2018	7.43
MC-TP4-D	27/01/2018	7.44
MC-TP4-D	28/01/2018	7.45
MC-TP4-D	29/01/2018	7.46
MC-TP4-D	30/01/2018	7.49
MC-TP4-D	31/01/2018	7.37

<u>Statistics:</u>	Mean	7.52
	Median	7.49
	Maximum	8.27
	Minimum	6.69

**PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
FEBRUARY 2018**

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/02/2018	41,212	7.4
MP-EFF-D	02/02/2018	42,992	7.46
MP-EFF-D	03/02/2018	48,156	7.45
MP-EFF-D	04/02/2018	58,305	7.47
MP-EFF-D	05/02/2018	50,672	7.46
MP-EFF-D	06/02/2018	50,650	7.41
MP-EFF-D	07/02/2018	49,390	7.43
MP-EFF-D	08/02/2018	52,806	7.34
MP-EFF-D	09/02/2018	43,648	7.48
MP-EFF-D	10/02/2018	34,564	7.59
MP-EFF-D	11/02/2018	34,594	7.46
MP-EFF-D	12/02/2018	32,601	7.58
MP-EFF-D	13/02/2018	34,188	7.6
MP-EFF-D	14/02/2018	30,218	7.48
MP-EFF-D	15/02/2018	26,453	7.49
MP-EFF-D	16/02/2018	31,421	7.54
MP-EFF-D	17/02/2018	33,275	7.56
MP-EFF-D	18/02/2018	23,272	7.61
MP-EFF-D	19/02/2018	23,221	7.67
MP-EFF-D	20/02/2018	22,056	7.90
MP-EFF-D	21/02/2018	21,227	7.86
MP-EFF-D	22/02/2018	21,324	8.19
MP-EFF-D	23/02/2018	15,201	8.11
MP-EFF-D	24/02/2018	16,858	8.06
MP-EFF-D	25/02/2018	23,099	8.05
MP-EFF-D	26/02/2018	22,151	7.94
MP-EFF-D	27/02/2018	23,672	7.89
MP-EFF-D	28/02/2018	24,411	7.12
MP-EFF-D			

Statistics:

	Flow	pH
Mean	33,273	7.63
Median	32,011	7.55
Maximum	58,305	8.19
Minimum	15,201	7.12
Running Total	931,636	

STATION	DATE	pH-L
MC-TP4-D	01/02/2018	7.48
MC-TP4-D	02/02/2018	7.46
MC-TP4-D	03/02/2018	7.4
MC-TP4-D	04/02/2018	7.34
MC-TP4-D	05/02/2018	7.35
MC-TP4-D	06/02/2018	7.36
MC-TP4-D	07/02/2018	7.43
MC-TP4-D	08/02/2018	7.5
MC-TP4-D	09/02/2018	7.53
MC-TP4-D	10/02/2018	7.55
MC-TP4-D	11/02/2018	7.57
MC-TP4-D	12/02/2018	7.57
MC-TP4-D	13/02/2018	7.57
MC-TP4-D	14/02/2018	7.77
MC-TP4-D	15/02/2018	7.84
MC-TP4-D	16/02/2018	7.75
MC-TP4-D	17/02/2018	7.70
MC-TP4-D	18/02/2018	7.68
MC-TP4-D	19/02/2018	7.67
MC-TP4-D	20/02/2018	7.62
MC-TP4-D	21/02/2018	7.64
MC-TP4-D	22/02/2018	7.73
MC-TP4-D	23/02/2018	7.85
MC-TP4-D	24/02/2018	7.82
MC-TP4-D	25/02/2018	7.82
MC-TP4-D	26/02/2018	7.79
MC-TP4-D	27/02/2018	7.71
MC-TP4-D	28/02/2018	7.41
MC-TP4-D		

Statistics:

Mean	7.60
Median	7.60
Maximum	7.85
Minimum	7.34

7.37

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
MARCH 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/03/2018	23,034	7.26
MP-EFF-D	02/03/2018	21,134	7.27
MP-EFF-D	03/03/2018	19,326	7.31
MP-EFF-D	04/03/2018	19,867	7.30
MP-EFF-D	05/03/2018	20,512	7.39
MP-EFF-D	06/03/2018	20,978	7.37
MP-EFF-D	07/03/2018	21,328	7.89
MP-EFF-D	08/03/2018	22,180	7.91
MP-EFF-D	09/03/2018	21,158	7.86
MP-EFF-D	10/03/2018	20,941	7.84
MP-EFF-D	11/03/2018	21,048	7.83
MP-EFF-D	12/03/2018	21,368	7.80
MP-EFF-D	13/03/2018	24,170	7.81
MP-EFF-D	14/03/2018	21,412	7.42
MP-EFF-D	15/03/2018	21,240	7.55
MP-EFF-D	16/03/2018	20,560	7.66
MP-EFF-D	17/03/2018	20,699	7.70
MP-EFF-D	18/03/2018	20,699	7.64
MP-EFF-D	19/03/2018	15,893	7.71
MP-EFF-D	20/03/2018	21,596	7.72
MP-EFF-D	21/03/2018	21,944	7.73
MP-EFF-D	22/03/2018	22,091	7.76
MP-EFF-D	23/03/2018	20,993	7.76
MP-EFF-D	24/03/2018	21,320	7.90
MP-EFF-D	25/03/2018	22,685	7.81
MP-EFF-D	26/03/2018	21,904	7.82
MP-EFF-D	27/03/2018	21,549	7.84
MP-EFF-D	28/03/2018	21,550	7.31
MP-EFF-D	29/03/2018	22,558	7.35
MP-EFF-D	30/03/2018	23,963	7.37
MP-EFF-D	31/03/2018	21,957	7.39

<u>Statistics:</u>	Flow	pH
Mean	21,344	7.62
Median	21,328	7.71
Maximum	24,170	7.91
Minimum	15,893	7.26
Running Total	661,655	

STATION	DATE	pH-L
MC-TP4-D	01/03/2018	7.43
MC-TP4-D	02/03/2018	7.39
MC-TP4-D	03/03/2018	7.32
MC-TP4-D	04/03/2018	7.29
MC-TP4-D	05/03/2018	7.25
MC-TP4-D	06/03/2018	7.22
MC-TP4-D	07/03/2018	7.81
MC-TP4-D	08/03/2018	7.75
MC-TP4-D	09/03/2018	7.68
MC-TP4-D	10/03/2018	7.62
MC-TP4-D	11/03/2018	7.57
MC-TP4-D	12/03/2018	7.56
MC-TP4-D	13/03/2018	7.53
MC-TP4-D	14/03/2018	7.79
MC-TP4-D	15/03/2018	7.67
MC-TP4-D	16/03/2018	7.61
MC-TP4-D	17/03/2018	7.57
MC-TP4-D	18/03/2018	7.50
MC-TP4-D	19/03/2018	7.50
MC-TP4-D	20/03/2018	7.51
MC-TP4-D	21/03/2018	8.12
MC-TP4-D	22/03/2018	8.02
MC-TP4-D	23/03/2018	7.96
MC-TP4-D	24/03/2018	7.95
MC-TP4-D	25/03/2018	7.90
MC-TP4-D	26/03/2018	7.89
MC-TP4-D	27/03/2018	
MC-TP4-D	28/03/2018	7.16
MC-TP4-D	29/03/2018	7.20
MC-TP4-D	30/03/2018	7.34
MC-TP4-D	31/03/2018	7.41

<u>Statistics:</u>	Mean	7.58
	Median	7.57
	Maximum	8.12
	Minimum	7.16

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
APRIL 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/04/2018	19,480	7.46
MP-EFF-D	02/04/2018	19,157	7.46
MP-EFF-D	03/04/2018	20,218	7.49
MP-EFF-D	04/04/2018	20,876	7.33
MP-EFF-D	05/04/2018	25,343	7.39
MP-EFF-D	06/04/2018	27,269	7.42
MP-EFF-D	07/04/2018	41,669	7.57
MP-EFF-D	08/04/2018	40,040	7.49
MP-EFF-D	09/04/2018	38,545	7.52
MP-EFF-D	10/04/2018	45,168	7.58
MP-EFF-D	11/04/2018	60,885	7.48
MP-EFF-D	12/04/2018	56,230	7.9
MP-EFF-D	13/04/2018	53,600	7.99
MP-EFF-D	14/04/2018	50,649	8.01
MP-EFF-D	15/04/2018	48,318	8
MP-EFF-D	16/04/2018	42,639	7.98
MP-EFF-D	17/04/2018	38,128	7.98
MP-EFF-D	18/04/2018	33,812	8.1
MP-EFF-D	19/04/2018	32,706	7.98
MP-EFF-D	20/04/2018	32,826	7.95
MP-EFF-D	21/04/2018	31,922	7.97
MP-EFF-D	22/04/2018	30,849	8.01
MP-EFF-D	23/04/2018	33,089	7.97
MP-EFF-D	24/04/2018	31,477	8
MP-EFF-D	25/04/2018	31,905	7.84
MP-EFF-D	26/04/2018	33,655	7.83
MP-EFF-D	27/04/2018	37,356	7.82
MP-EFF-D	28/04/2018	37,628	7.83
MP-EFF-D	29/04/2018	35,791	7.82
MP-EFF-D	30/04/2018	36,673	7.81

Statistics:

	Flow	pH
Mean	36,263	7.77
Median	34,802	7.83
Maximum	60,885	8.10
Minimum	19,157	7.33
Running Total	1,087,902	

STATION	DATE	pH-L
MC-TP4-D	01/04/2018	7.44
MC-TP4-D	02/04/2018	7.39
MC-TP4-D	03/04/2018	7.43
MC-TP4-D	04/04/2018	7.36
MC-TP4-D	05/04/2018	7.42
MC-TP4-D	06/04/2018	7.49
MC-TP4-D	07/04/2018	7.54
MC-TP4-D	08/04/2018	7.47
MC-TP4-D	09/04/2018	7.42
MC-TP4-D	10/04/2018	7.49
MC-TP4-D	11/04/2018	8.36
MC-TP4-D	12/04/2018	8.28
MC-TP4-D	13/04/2018	8.28
MC-TP4-D	14/04/2018	8.16
MC-TP4-D	15/04/2018	8.03
MC-TP4-D	16/04/2018	8.03
MC-TP4-D	17/04/2018	7.98
MC-TP4-D	18/04/2018	8.23
MC-TP4-D	19/04/2018	8.11
MC-TP4-D	20/04/2018	8.05
MC-TP4-D	21/04/2018	7.92
MC-TP4-D	22/04/2018	7.87
MC-TP4-D	23/04/2018	7.76
MC-TP4-D	24/04/2018	7.75
MC-TP4-D	25/04/2018	8.38
MC-TP4-D	26/04/2018	8.14
MC-TP4-D	27/04/2018	8.09
MC-TP4-D	28/04/2018	7.91
MC-TP4-D	29/04/2018	7.84
MC-TP4-D	30/04/2018	7.78

Statistics:

Mean	7.85
Median	7.89
Maximum	8.38
Minimum	7.36

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
MAY 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/05/2018	37,984	7.79
MP-EFF-D	02/05/2018	39,083	7.29
MP-EFF-D	03/05/2018	38,735	7.34
MP-EFF-D	04/05/2018	37,919	7.37
MP-EFF-D	05/05/2018	38,556	7.41
MP-EFF-D	06/05/2018	39,713	7.45
MP-EFF-D	07/05/2018	41,030	7.52
MP-EFF-D	08/05/2018	40,410	7.58
MP-EFF-D	09/05/2018	42,414	8.01
MP-EFF-D	10/05/2018	39,616	8.00
MP-EFF-D	11/05/2018	35,689	7.98
MP-EFF-D	12/05/2018	37,573	7.95
MP-EFF-D	13/05/2018	39,443	7.93
MP-EFF-D	14/05/2018	38,692	7.90
MP-EFF-D	15/05/2018	37,141	7.86
MP-EFF-D	16/05/2018	38,824	8.34
MP-EFF-D	17/05/2018	38,824	8.30
MP-EFF-D	18/05/2018	38,824	8.26
MP-EFF-D	19/05/2018	40,410	8.23
MP-EFF-D	20/05/2018	40,410	8.19
MP-EFF-D	21/05/2018	38,824	8.17
MP-EFF-D	22/05/2018	38,824	8.16
MP-EFF-D	23/05/2018	38,824	8.30
MP-EFF-D	24/05/2018	39,739	8.23
MP-EFF-D	25/05/2018	38,935	8.26
MP-EFF-D	26/05/2018	38,948	8.07
MP-EFF-D	27/05/2018	39,860	7.97
MP-EFF-D	28/05/2018	41,295	8.08
MP-EFF-D	29/05/2018	39,977	8.12
MP-EFF-D	30/05/2018	33,972	7.50
MP-EFF-D	31/05/2018	36,222	7.59

<u>Statistics:</u>	Flow	pH
Mean	38,926	7.91
Median	38,824	7.98
Maximum	42,414	8.34
Minimum	33,972	7.29
Running Total	1,206,708	

STATION	DATE	pH-L
MC-TP4-D	01/05/2018	7.65
MC-TP4-D	02/05/2018	7.94
MC-TP4-D	03/05/2018	7.95
MC-TP4-D	04/05/2018	7.84
MC-TP4-D	05/05/2018	7.72
MC-TP4-D	06/05/2018	7.65
MC-TP4-D	07/05/2018	7.60
MC-TP4-D	08/05/2018	7.57
MC-TP4-D	09/05/2018	8.27
MC-TP4-D	10/05/2018	8.06
MC-TP4-D	11/05/2018	7.98
MC-TP4-D	12/05/2018	7.86
MC-TP4-D	13/05/2018	7.76
MC-TP4-D	14/05/2018	7.70
MC-TP4-D	15/05/2018	7.61
MC-TP4-D	16/05/2018	8.43
MC-TP4-D	17/05/2018	8.36
MC-TP4-D	18/05/2018	8.29
MC-TP4-D	19/05/2018	8.04
MC-TP4-D	20/05/2018	8.00
MC-TP4-D	21/05/2018	7.93
MC-TP4-D	22/05/2018	7.88
MC-TP4-D	23/05/2018	8.30
MC-TP4-D	24/05/2018	8.24
MC-TP4-D	25/05/2018	8.15
MC-TP4-D	26/05/2018	8.05
MC-TP4-D	27/05/2018	8.00
MC-TP4-D	28/05/2018	7.97
MC-TP4-D	29/05/2018	7.93
MC-TP4-D	30/05/2018	8.01
MC-TP4-D	31/05/2018	8.05

<u>Statistics:</u>	Mean	7.96
	Median	7.97
	Maximum	8.43
	Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
JUNE 2018

STATION	DATE	FLOW	pH
	m/dd/yyyy	m ³ /day	
MP-EFF-D	01/06/2018	34,481	7.64
MP-EFF-D	02/06/2018	37,990	7.71
MP-EFF-D	03/06/2018	34,435	7.70
MP-EFF-D	04/06/2018	39,391	7.74
MP-EFF-D	05/06/2018	38,489	7.75
MP-EFF-D	06/06/2018	33,279	7.40
MP-EFF-D	07/06/2018	35,761	7.53
MP-EFF-D	08/06/2018	43,562	7.65
MP-EFF-D	09/06/2018	44,358	7.73
MP-EFF-D	10/06/2018	40,504	7.96
MP-EFF-D	11/06/2018	40,957	7.84
MP-EFF-D	12/06/2018	40,607	7.82
MP-EFF-D	13/06/2018	42,773	7.44
MP-EFF-D	14/06/2018	36,202	7.55
MP-EFF-D	15/06/2018	24,688	7.38
MP-EFF-D	16/06/2018	38,262	7.55
MP-EFF-D	17/06/2018	40,443	7.26
MP-EFF-D	18/06/2018	37,770	7.59
MP-EFF-D	19/06/2018	41,517	7.78
MP-EFF-D	20/06/2018	44,113	7.36
MP-EFF-D	21/06/2018	43,597	7.64
MP-EFF-D	22/06/2018	41,481	7.79
MP-EFF-D	23/06/2018	35,222	7.87
MP-EFF-D	24/06/2018	32,005	7.91
MP-EFF-D	25/06/2018	37,349	7.90
MP-EFF-D	26/06/2018	36,471	7.90
MP-EFF-D	27/06/2018	35,051	7.42
MP-EFF-D	28/06/2018	33,711	7.44
MP-EFF-D	29/06/2018	40,504	7.46
MP-EFF-D	30/06/2018	37,349	7.49

STATION	DATE	pH-L
MC-TP4-D	01/06/2018	8.00
MC-TP4-D	02/06/2018	7.97
MC-TP4-D	03/06/2018	7.90
MC-TP4-D	04/06/2018	7.88
MC-TP4-D	05/06/2018	7.82
MC-TP4-D	06/06/2018	7.20
MC-TP4-D	07/06/2018	7.38
MC-TP4-D	08/06/2018	7.43
MC-TP4-D	09/06/2018	7.39
MC-TP4-D	10/06/2018	7.42
MC-TP4-D	11/06/2018	7.41
MC-TP4-D	12/06/2018	7.45
MC-TP4-D	13/06/2018	7.23
MC-TP4-D	14/06/2018	7.23
MC-TP4-D	15/06/2018	7.21
MC-TP4-D	16/06/2018	7.22
MC-TP4-D	17/06/2018	7.23
MC-TP4-D	18/06/2018	7.21
MC-TP4-D	19/06/2018	7.21
MC-TP4-D	20/06/2018	8.09
MC-TP4-D	21/06/2018	8.02
MC-TP4-D	22/06/2018	7.88
MC-TP4-D	23/06/2018	7.82
MC-TP4-D	24/06/2018	7.78
MC-TP4-D	25/06/2018	7.68
MC-TP4-D	26/06/2018	7.68
MC-TP4-D	27/06/2018	7.67
MC-TP4-D	28/06/2018	7.63
MC-TP4-D	29/06/2018	7.62
MC-TP4-D	30/06/2018	7.61

Original Value before recalibration	MP-EFF	MC-TP4
12/06/2018	8.36	8.94

<u>Statistics:</u>	Flow	pH
Mean	38,077	7.64
Median	38,126	7.65
Maximum	44,358	7.96
Minimum	24,688	7.26
Running Total	1,142,321	

Statistics:	Mean	7.58
	Median	7.62
	Maximum	8.09
	Minimum	7.20

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
JANUARY 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/07/2018	29,381	7.50
MP-EFF-D	02/07/2018	29,170	7.49
MP-EFF-D	03/07/2018	41,211	7.29
MP-EFF-D	04/07/2018	38,531	7.33
MP-EFF-D	05/07/2018	34,660	7.52
MP-EFF-D	06/07/2018	35,507	7.57
MP-EFF-D	07/07/2018	36,720	7.59
MP-EFF-D	08/07/2018	36,675	7.60
MP-EFF-D	09/07/2018	36,397	7.61
MP-EFF-D	10/07/2018	35,188	7.63
MP-EFF-D	11/07/2018	36,536	8.08
MP-EFF-D	12/07/2018	29,757	7.96
MP-EFF-D	13/07/2018	35,805	7.94
MP-EFF-D	14/07/2018	37,662	7.88
MP-EFF-D	15/07/2018	36,611	7.84
MP-EFF-D	16/07/2018	35,611	7.79
MP-EFF-D	17/07/2018	23,506	7.71
MP-EFF-D	18/07/2018	20,275	7.62
MP-EFF-D	19/07/2018	26,855	7.66
MP-EFF-D	20/07/2018	29,451	7.63
MP-EFF-D	21/07/2018	28,784	7.62
MP-EFF-D	22/07/2018	30,155	7.58
MP-EFF-D	23/07/2018	30,789	7.57
MP-EFF-D	24/07/2018	31,160	7.58
MP-EFF-D	25/07/2018	29,602	7.43
MP-EFF-D	26/07/2018	32,052	7.35
MP-EFF-D	27/07/2018	32,077	7.36
MP-EFF-D	28/07/2018	32,077	7.28
MP-EFF-D	29/07/2018	22,086	7.50
MP-EFF-D	30/07/2018	32,096	7.47
MP-EFF-D	31/07/2018	43,462	7.57

<u>Statistics:</u>	Flow	pH
Mean	32,576	7.60
Median	32,077	7.58
Maximum	43,462	8.08
Minimum	20,275	7.28
Running Total	1,009,849	

STATION	DATE	pH-L
MC-TP4-D	01/07/2018	7.54
MC-TP4-D	02/07/2018	7.46
MC-TP4-D	03/07/2018	7.41
MC-TP4-D	04/07/2018	7.86
MC-TP4-D	05/07/2018	7.70
MC-TP4-D	06/07/2018	7.62
MC-TP4-D	07/07/2018	7.48
MC-TP4-D	08/07/2018	7.29
MC-TP4-D	09/07/2018	6.52
MC-TP4-D	10/07/2018	6.69
MC-TP4-D	11/07/2018	7.84
MC-TP4-D	12/07/2018	7.72
MC-TP4-D	13/07/2018	7.56
MC-TP4-D	14/07/2018	7.51
MC-TP4-D	15/07/2018	7.52
MC-TP4-D	16/07/2018	7.45
MC-TP4-D	17/07/2018	7.32
MC-TP4-D	18/07/2018	7.78
MC-TP4-D	19/07/2018	7.68
MC-TP4-D	20/07/2018	7.52
MC-TP4-D	21/07/2018	7.41
MC-TP4-D	22/07/2018	7.39
MC-TP4-D	23/07/2018	7.35
MC-TP4-D	24/07/2018	7.28
MC-TP4-D	25/07/2018	7.20
MC-TP4-D	26/07/2018	7.21
MC-TP4-D	27/07/2018	7.30
MC-TP4-D	28/07/2018	7.27
MC-TP4-D	29/07/2018	7.30
MC-TP4-D	30/07/2018	7.28
MC-TP4-D	31/07/2018	7.26

<u>Statistics:</u>	Mean	7.41
	Median	7.41
	Maximum	7.86
	Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
AUGUST 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/08/2018	30,126	7.85
MP-EFF-D	02/08/2018	35,108	7.84
MP-EFF-D	03/08/2018	32,979	7.82
MP-EFF-D	04/08/2018	30,090	7.84
MP-EFF-D	05/08/2018	35,002	7.88
MP-EFF-D	06/08/2018	32,219	7.91
MP-EFF-D	07/08/2018	31,219	8.00
MP-EFF-D	08/08/2018	30,258	7.46
MP-EFF-D	09/08/2018	27,697	7.76
MP-EFF-D	10/08/2018	24,851	7.97
MP-EFF-D	11/08/2018	24,647	7.99
MP-EFF-D	12/08/2018	23,197	8.01
MP-EFF-D	13/08/2018	23,905	8.00
MP-EFF-D	14/08/2018	25,260	8.05
MP-EFF-D	15/08/2018	24,870	7.35
MP-EFF-D	16/08/2018	26,646	7.56
MP-EFF-D	17/08/2018	23,466	7.73
MP-EFF-D	18/08/2018	22,700	7.86
MP-EFF-D	19/08/2018	24,024	7.38
MP-EFF-D	20/08/2018	25,117	7.19
MP-EFF-D	21/08/2018	24,045	7.51
MP-EFF-D	22/08/2018	25,907	7.60
MP-EFF-D	23/08/2018	31,046	7.71
MP-EFF-D	24/08/2018	26,526	7.84
MP-EFF-D	25/08/2018	25,645	7.88
MP-EFF-D	26/08/2018	24,568	7.89
MP-EFF-D	27/08/2018	26,951	7.93
MP-EFF-D	28/08/2018	29,756	7.95
MP-EFF-D	29/08/2018	26,724	7.94
MP-EFF-D	30/08/2018	28,545	7.85
MP-EFF-D	31/08/2018	26,309	7.77

<u>Statistics:</u>	Flow	pH
Mean	27,400	7.78
Median	26,526	7.85
Maximum	35,108	8.05
Minimum	22,700	7.19
Running Total	849,399	

STATION	DATE	pH-L
MC-TP4-D	01/08/2018	7.74
MC-TP4-D	02/08/2018	7.81
MC-TP4-D	03/08/2018	7.78
MC-TP4-D	04/08/2018	7.73
MC-TP4-D	05/08/2018	7.69
MC-TP4-D	06/08/2018	7.65
MC-TP4-D	07/08/2018	7.60
MC-TP4-D	08/08/2018	8.06
MC-TP4-D	09/08/2018	8.08
MC-TP4-D	10/08/2018	7.86
MC-TP4-D	11/08/2018	7.87
MC-TP4-D	12/08/2018	7.79
MC-TP4-D	13/08/2018	7.75
MC-TP4-D	14/08/2018	7.76
MC-TP4-D	15/08/2018	6.86
MC-TP4-D	16/08/2018	7.01
MC-TP4-D	17/08/2018	7.10
MC-TP4-D	18/08/2018	7.19
MC-TP4-D	19/08/2018	7.22
MC-TP4-D	20/08/2018	7.26
MC-TP4-D	21/08/2018	7.25
MC-TP4-D	22/08/2018	6.98
MC-TP4-D	23/08/2018	7.06
MC-TP4-D	24/08/2018	7.13
MC-TP4-D	25/08/2018	7.16
MC-TP4-D	26/08/2018	7.19
MC-TP4-D	27/08/2018	7.18
MC-TP4-D	28/08/2018	7.21
MC-TP4-D	29/08/2018	7.62
MC-TP4-D	30/08/2018	7.52
MC-TP4-D	31/08/2018	7.44

<u>Statistics:</u>	Mean	7.47
	Median	7.52
	Maximum	8.08
	Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
SEPTEMBER 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/09/2018	26,741	7.76
MP-EFF-D	02/09/2018	27,365	7.78
MP-EFF-D	03/09/2018	23,711	7.82
MP-EFF-D	04/09/2018	24,983	7.94
MP-EFF-D	05/09/2018	21,583	8.10
MP-EFF-D	06/09/2018	27,156	7.99
MP-EFF-D	07/09/2018	18,875	7.94
MP-EFF-D	08/09/2018	25,575	7.83
MP-EFF-D	09/09/2018	34,269	7.54
MP-EFF-D	10/09/2018	46,008	7.60
MP-EFF-D	11/09/2018	43,073	7.71
MP-EFF-D	12/09/2018	37,244	8.45
MP-EFF-D	13/09/2018	34,056	8.23
MP-EFF-D	14/09/2018	33,748	8.01
MP-EFF-D	15/09/2018	38,125	7.68
MP-EFF-D	16/09/2018	39,871	7.54
MP-EFF-D	17/09/2018	33,172	7.48
MP-EFF-D	18/09/2018	27,842	7.69
MP-EFF-D	19/09/2018	29,127	8.01
MP-EFF-D	20/09/2018	31,410	8.01
MP-EFF-D	21/09/2018	42,949	7.78
MP-EFF-D	22/09/2018	42,456	7.68
MP-EFF-D	23/09/2018	37,958	7.56
MP-EFF-D	24/09/2018	40,663	7.51
MP-EFF-D	25/09/2018	25,875	7.46
MP-EFF-D	26/09/2018	26,540	7.11
MP-EFF-D	27/09/2018	26,006	7.37
MP-EFF-D	28/09/2018	24,485	7.55
MP-EFF-D	29/09/2018	29,112	7.55
MP-EFF-D	30/09/2018	36,692	7.56

<u>Statistics:</u>	Flow	pH
Mean	31,889	7.74
Median	30,269	7.70
Maximum	46,008	8.45
Minimum	18,875	7.11
Running Total	956,670	

STATION	DATE	pH-L
MC-TP4-D	01/09/2018	7.39
MC-TP4-D	02/09/2018	7.37
MC-TP4-D	03/09/2018	7.33
MC-TP4-D	04/09/2018	7.27
MC-TP4-D	05/09/2018	7.60
MC-TP4-D	06/09/2018	7.49
MC-TP4-D	07/09/2018	7.49
MC-TP4-D	08/09/2018	7.40
MC-TP4-D	09/09/2018	7.49
MC-TP4-D	10/09/2018	7.29
MC-TP4-D	11/09/2018	7.18
MC-TP4-D	12/09/2018	7.62
MC-TP4-D	13/09/2018	7.56
MC-TP4-D	14/09/2018	7.52
MC-TP4-D	15/09/2018	7.48
MC-TP4-D	16/09/2018	7.39
MC-TP4-D	17/09/2018	7.34
MC-TP4-D	18/09/2018	7.32
MC-TP4-D	19/09/2018	7.64
MC-TP4-D	20/09/2018	7.55
MC-TP4-D	21/09/2018	7.44
MC-TP4-D	22/09/2018	7.44
MC-TP4-D	23/09/2018	7.31
MC-TP4-D	24/09/2018	7.28
MC-TP4-D	25/09/2018	7.26
MC-TP4-D	26/09/2018	7.14
MC-TP4-D	27/09/2018	7.24
MC-TP4-D	28/09/2018	7.39
MC-TP4-D	29/09/2018	7.41
MC-TP4-D	30/09/2018	7.51

<u>Statistics:</u>	Mean	7.40
	Median	7.40
	Maximum	7.64
	Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
OCTOBER 2018

STATION	DATE d/m/y	FLOW m ³ /day	pH
MP-EFF-D	01/10/2018	45,571	7.54
MP-EFF-D	02/10/2018	46,940	7.57
MP-EFF-D	03/10/2018	49,792	7.70
MP-EFF-D	04/10/2018	35,215	7.69
MP-EFF-D	05/10/2018	31,343	7.69
MP-EFF-D	06/10/2018	30,510	7.73
MP-EFF-D	07/10/2018	34,047	7.72
MP-EFF-D	08/10/2018	32,946	7.65
MP-EFF-D	09/10/2018	35,846	7.61
MP-EFF-D	10/10/2018	43,380	7.35
MP-EFF-D	11/10/2018	50,521	7.38
MP-EFF-D	12/10/2018	57,243	7.46
MP-EFF-D	13/10/2018	46,158	7.54
MP-EFF-D	14/10/2018	34,844	7.57
MP-EFF-D	15/10/2018	31,151	7.60
MP-EFF-D	16/10/2018	29,109	7.59
MP-EFF-D	17/10/2018	26,985	7.51
MP-EFF-D	18/10/2018	26,588	7.54
MP-EFF-D	19/10/2018	26,560	7.50
MP-EFF-D	20/10/2018	34,568	7.43
MP-EFF-D	21/10/2018	34,298	7.35
MP-EFF-D	22/10/2018	33,781	7.41
MP-EFF-D	23/10/2018	34,573	7.36
MP-EFF-D	24/10/2018	31,017	7.67
MP-EFF-D	25/10/2018	29,623	7.66
MP-EFF-D	26/10/2018	37,383	7.66
MP-EFF-D	27/10/2018	51,294	7.70
MP-EFF-D	28/10/2018	45,017	7.72
MP-EFF-D	29/10/2018	28,278	7.77
MP-EFF-D	30/10/2018	38,147	7.72
MP-EFF-D	31/10/2018	38,748	7.75

Statistics:

	Flow	pH
Mean	37,144	7.59
Median	34,573	7.60
Maximum	57,243	7.77
Minimum	26,560	7.35
Running Total	1,151,473	

STATION	DATE	pH-L
MC-TP4-D	01/10/2018	7.47
MC-TP4-D	02/10/2018	7.42
MC-TP4-D	03/10/2018	7.71
MC-TP4-D	04/10/2018	7.72
MC-TP4-D	05/10/2018	7.71
MC-TP4-D	06/10/2018	7.67
MC-TP4-D	07/10/2018	7.66
MC-TP4-D	08/10/2018	7.61
MC-TP4-D	09/10/2018	7.51
MC-TP4-D	10/10/2018	7.76
MC-TP4-D	11/10/2018	7.64
MC-TP4-D	12/10/2018	7.59
MC-TP4-D	13/10/2018	7.58
MC-TP4-D	14/10/2018	7.55
MC-TP4-D	15/10/2018	7.53
MC-TP4-D	16/10/2018	7.50
MC-TP4-D	17/10/2018	8.16
MC-TP4-D	18/10/2018	7.11
MC-TP4-D	19/10/2018	8.12
MC-TP4-D	20/10/2018	7.93
MC-TP4-D	21/10/2018	7.90
MC-TP4-D	22/10/2018	7.86
MC-TP4-D	23/10/2018	
MC-TP4-D	24/10/2018	7.75
MC-TP4-D	25/10/2018	7.70
MC-TP4-D	26/10/2018	7.60
MC-TP4-D	27/10/2018	7.48
MC-TP4-D	28/10/2018	7.48
MC-TP4-D	29/10/2018	7.43
MC-TP4-D	30/10/2018	7.33
MC-TP4-D	31/10/2018	7.80

Statistics:

Mean	7.64
Median	7.63
Maximum	8.16
Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
NOVEMBER 2018

STATION	DATE d/m/y	FLOW m ³ /day	pH
MP-EFF-D	01/11/2018	58,822	7.58
MP-EFF-D	02/11/2018	56,183	7.55
MP-EFF-D	03/11/2018	72,719	7.49
MP-EFF-D	04/11/2018	57,498	7.39
MP-EFF-D	05/11/2018	55,108	7.22
MP-EFF-D	06/11/2018	51,172	7.27
MP-EFF-D	07/11/2018	45,996	7.85
MP-EFF-D	08/11/2018	41,767	7.81
MP-EFF-D	09/11/2018	38,697	7.80
MP-EFF-D	10/11/2018	34,323	7.82
MP-EFF-D	11/11/2018	31,881	7.81
MP-EFF-D	12/11/2018	34,489	7.78
MP-EFF-D	13/11/2018	47,441	7.62
MP-EFF-D	14/11/2018	61,565	7.60
MP-EFF-D	15/11/2018	47,740	7.59
MP-EFF-D	16/11/2018	39,648	7.58
MP-EFF-D	17/11/2018	32,935	7.59
MP-EFF-D	18/11/2018	32,427	7.58
MP-EFF-D	19/11/2018	32,957	7.58
MP-EFF-D	20/11/2018	33,861	7.59
MP-EFF-D	21/11/2018	41,123	7.70
MP-EFF-D	22/11/2018	44,183	7.66
MP-EFF-D	23/11/2018	40,288	7.67
MP-EFF-D	24/11/2018	32,436	7.68
MP-EFF-D	25/11/2018	42,369	7.71
MP-EFF-D	26/11/2018	91,490	7.75
MP-EFF-D	27/11/2018	72,535	7.85
MP-EFF-D	28/11/2018	57,154	7.64
MP-EFF-D	29/11/2018	57,551	7.59
MP-EFF-D	30/11/2018	50,601	7.70

<u>Statistics:</u>	Flow	pH
Mean	47,899	7.64
Median	45,090	7.63
Maximum	91,490	7.85
Minimum	31,881	7.22
Running Total	1,436,960	

STATION	DATE	pH-L
MC-TP4-D	01/11/2018	7.67
MC-TP4-D	02/11/2018	7.62
MC-TP4-D	03/11/2018	7.65
MC-TP4-D	04/11/2018	7.57
MC-TP4-D	05/11/2018	7.62
MC-TP4-D	06/11/2018	7.52
MC-TP4-D	07/11/2018	7.60
MC-TP4-D	08/11/2018	7.55
MC-TP4-D	09/11/2018	7.53
MC-TP4-D	10/11/2018	7.50
MC-TP4-D	11/11/2018	7.49
MC-TP4-D	12/11/2018	7.47
MC-TP4-D	13/11/2018	7.47
MC-TP4-D	14/11/2018	7.43
MC-TP4-D	15/11/2018	7.38
MC-TP4-D	16/11/2018	7.35
MC-TP4-D	17/11/2018	7.32
MC-TP4-D	18/11/2018	7.31
MC-TP4-D	19/11/2018	7.29
MC-TP4-D	20/11/2018	7.27
MC-TP4-D	21/11/2018	7.77
MC-TP4-D	22/11/2018	7.59
MC-TP4-D	23/11/2018	7.53
MC-TP4-D	24/11/2018	7.47
MC-TP4-D	25/11/2018	7.45
MC-TP4-D	26/11/2018	7.37
MC-TP4-D	27/11/2018	7.26
MC-TP4-D	28/11/2018	7.86
MC-TP4-D	29/11/2018	7.82
MC-TP4-D	30/11/2018	7.78

<u>Statistics:</u>	Mean	7.52
	Median	7.51
	Maximum	7.86
	Minimum	0.00

PHYSICAL PARAMETERS - MYRA & TP4 DAILY COMPOSITES
DECEMBER 2018

STATION	DATE m/dd/yyyy	FLOW m ³ /day	pH
MP-EFF-D	01/12/2018	47,194	7.61
MP-EFF-D	02/12/2018	48,489	7.57
MP-EFF-D	03/12/2018	43,090	7.54
MP-EFF-D	04/12/2018	39,375	7.54
MP-EFF-D	05/12/2018	36,925	7.51
MP-EFF-D	06/12/2018	37,686	7.54
MP-EFF-D	07/12/2018	40,330	7.46
MP-EFF-D	08/12/2018	37,311	7.53
MP-EFF-D	09/12/2018	55,537	7.62
MP-EFF-D	10/12/2018	43,430	7.67
MP-EFF-D	11/12/2018	62,708	7.76
MP-EFF-D	12/12/2018	63,641	6.73
MP-EFF-D	13/12/2018	82,669	8.02
MP-EFF-D	14/12/2018	115,809	8.01
MP-EFF-D	15/12/2018	72,840	8.00
MP-EFF-D	16/12/2018	94,711	8.03
MP-EFF-D	17/12/2018	106,616	8.01
MP-EFF-D	18/12/2018	86,764	8.00
MP-EFF-D	19/12/2018	67,884	7.26
MP-EFF-D	20/12/2018	85,919	7.75
MP-EFF-D	21/12/2018	66,749	7.83
MP-EFF-D	22/12/2018	66,777	7.16
MP-EFF-D	23/12/2018	67,887	7.83
MP-EFF-D	24/12/2018	54,903	7.80
MP-EFF-D	25/12/2018	49,306	7.78
MP-EFF-D	26/12/2018	43,064	7.69
MP-EFF-D	27/12/2018	34,919	7.71
MP-EFF-D	28/12/2018	34,928	7.66
MP-EFF-D	29/12/2018	48,179	7.55
MP-EFF-D	30/12/2018	34,929	7.56
MP-EFF-D	31/12/2018	35,502	7.59

<u>Statistics:</u>	Flow	pH
Mean	58,260	7.66
Median	49,306	7.66
Maximum	115,809	8.03
Minimum	34,919	6.73
Running Total	1,806,069	

STATION	DATE	pH-L
MC-TP4-D	01/12/2018	7.74
MC-TP4-D	02/12/2018	7.71
MC-TP4-D	03/12/2018	7.67
MC-TP4-D	04/12/2018	7.65
MC-TP4-D	05/12/2018	7.60
MC-TP4-D	06/12/2018	
MC-TP4-D	07/12/2018	7.58
MC-TP4-D	08/12/2018	7.52
MC-TP4-D	09/12/2018	7.52
MC-TP4-D	10/12/2018	7.55
MC-TP4-D	11/12/2018	7.50
MC-TP4-D	12/12/2018	7.71
MC-TP4-D	13/12/2018	7.77
MC-TP4-D	14/12/2018	7.68
MC-TP4-D	15/12/2018	7.56
MC-TP4-D	16/12/2018	7.52
MC-TP4-D	17/12/2018	7.47
MC-TP4-D	18/12/2018	7.48
MC-TP4-D	19/12/2018	7.94
MC-TP4-D	20/12/2018	7.90
MC-TP4-D	21/12/2018	7.76
MC-TP4-D	22/12/2018	7.67
MC-TP4-D	23/12/2018	7.62
MC-TP4-D	24/12/2018	7.53
MC-TP4-D	25/12/2018	7.46
MC-TP4-D	26/12/2018	7.60
MC-TP4-D	27/12/2018	7.52
MC-TP4-D	28/12/2018	7.66
MC-TP4-D	29/12/2018	7.68
MC-TP4-D	30/12/2018	7.64
MC-TP4-D	31/12/2018	7.50

<u>Statistics:</u>	Mean	7.62
	Median	7.61
	Maximum	7.94
	Minimum	0.00

JANUARY

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01-Jan	0.08	0.00659	0.119	0.00267					0.00
02-Jan	0.0722	0.00546	0.123	0.00288					0.00
03-Jan	0.0799	0.00617	0.119	0.00206	0.0926	0.00739	0.109	0.00262	0.00
04-Jan	0.0904	0.0078	0.12	0.00229					3.20
05-Jan	0.125	0.0093	0.0463	0.00237					12.10
06-Jan	0.144	0.0115	0.0558	0.00206					9.10
07-Jan	0.155	0.0145	0.0668	0.00219					10.70
08-Jan	0.212	0.0223	0.0673	0.0024					10.20
09-Jan	0.129	0.0112	0.0717	0.00244					3.50
10-Jan	0.104	0.00537	0.0765	0.0021	0.131	0.0116	0.0776	0.00256	6.00
11-Jan	0.0947	0.00444	0.0872	0.00214					4.00
12-Jan	0.0756	0.00384	0.0925	0.00237					5.70
13-Jan	0.0629	0.00373	0.086	0.00212					1.90
14-Jan	0.0567	0.00551	0.0706	0.00214					0.10
15-Jan	0.0519	0.00332	0.0614	0.00261					11.30
16-Jan	0.194	0.0235	0.0508	0.00363					37.30
17-Jan	0.192	0.0173	0.0682	0.00401	0.0993	0.00771	0.0672	0.00271	89.80
18-Jan	0.228	0.022	0.096	0.00408					70.30
19-Jan	0.163	0.0132	0.121	0.00387					32.30
20-Jan	0.126	0.0101	0.13	0.00549					45.60
21-Jan	0.333	0.0307	0.143	0.00451					89.20
22-Jan	0.247	0.0251	0.121	0.00498					14.90
23-Jan	0.136	0.0122	0.121	0.00355					19.00
24-Jan	0.177	0.0176	0.120	0.00269	0.764	0.1	0.134	0.00489	8.10
25-Jan	0.214	0.0198	0.119	0.00302					0.20
26-Jan	0.19	0.0158	0.121	0.00307					0.20
27-Jan	0.208	0.0167	0.122	0.00303					0.40
28-Jan	0.412	0.0369	0.074	0.00356					45.50
29-Jan	0.368	0.037	0.076	0.0033					53.90
30-Jan	0.372	0.0365	0.106	0.00342					17.70
31-Jan	0.294	0.0252	0.104	0.00286	0.285	0.0291	0.109	0.00509	3.00
Averages	0.1738	0.0155	0.0954	0.0030					19.5226
Total	5.3873	0.4806	2.9561	0.0939					605.2000

Feb-18 2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01-Feb	0.249	0.02	0.116	0.00306					9.60
02-Feb	0.254	0.0243	0.102	0.003					11.20
03-Feb	0.338	0.0331	0.0763	0.00301					18.10
04-Feb	0.399	0.0397	0.0625	0.00293					5.20
05-Feb	0.435	0.0419	0.0822	0.00283					0.00
06-Feb	0.255	0.0284	0.0904	0.00305					4.80
07-Feb	0.285	0.0313	0.0804	0.00413	0.306	0.03	0.0891	0.00278	6.60
08-Feb	0.347	0.0368	0.0731	0.0034					2.30
09-Feb	0.297	0.0299	0.0882	0.00312					0.10
10-Feb	0.187	0.0166	0.0935	0.00295					0.10
11-Feb	0.141	0.0111	0.0965	0.0026					0.00
12-Feb	0.119	0.00791	0.102	0.00512					0.00
13-Feb	0.101	0.00648	0.103	0.00271					8.00
14-Feb	0.0937	0.00409	0.109	0.00225					0.40
15-Feb	0.0921	0.00501	0.107	0.00144	0.0741	0.00756	0.0861	0.00373	0.70
16-Feb	0.0629	0.00199	0.113	0.00202					2.30
17-Feb	0.0877	0.00445	0.113	0.00151					15.20
18-Feb	0.0865	0.00572	0.132	0.00226					0.10
19-Feb	0.0492	0.00559	0.117	0.00211					0.00
20-Feb	0.0481	0.00647	0.0978	0.00391					0.00
21-Feb	0.118	0.024	0.111	0.00425	0.206	0.0199	0.112	0.00262	0.90
22-Feb	0.0442	0.00759	0.124	0.00573					0.20
23-Feb	0.0689	0.00966	0.126	0.00861					4.10
24-Feb	0.0653	0.00496	0.136	0.0145					6.00
25-Feb	0.0574	0.00546	0.133	0.013					5.40
26-Feb	0.04	0.00303	0.142	0.0216					0.10
27-Feb	0.0425	0.00343	0.177	0.0188					0.60
28-Feb	0.0548	0.00507	0.111	0.00204	0.0639	0.00343	0.131	0.0109	8.90

Averages	0.158	0.0151	0.1077	0.0052					3.961
Total	4.418	0.424	3.015	0.146					110.900

March

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01-Mar	0.066	0.00703	0.101	0.00338					7.80
02-Mar	0.0773	0.00788	0.112	0.00229					2.40
03-Mar	0.0896	0.00914	0.116	0.00232					0.00
04-Mar	0.126	0.014	0.121	0.00252					0.00
05-Mar	0.0755	0.00868	0.12	0.00247					0.00
06-Mar	0.0569	0.00495	0.125	0.00249					0.40
07-Mar	0.107	0.0154	0.129	0.00219	0.0503	0.00552	0.115	0.00283	0.00
08-Mar	0.0627	0.00818	0.132	0.00321					8.90
09-Mar	0.0799	0.00874	0.133	0.0031					0.00
10-Mar	0.0675	0.0068	0.131	0.00333					0.00
11-Mar	0.0755	0.00808	0.13	0.0029					
12-Mar	0.0593	0.00588	0.131	0.0029					0.10
13-Mar	0.0474	0.00409	0.13	0.00289					6.30
14-Mar	0.0345	0.00288	0.118	0.00352	0.0658	0.00741	0.131	0.00308	4.30
15-Mar	0.0328	0.00245	0.119	0.00254					0.00
16-Mar	0.0507	0.00317	0.124	0.0024					0.00
17-Mar	0.0332	0.00224	0.127	0.00235					0.00
18-Mar	0.0507	0.00287	0.124	0.00281					0.00
19-Mar	0.0581	0.00347	0.121	0.00251					0.00
20-Mar	0.0806	0.00738	0.123	0.00277					0.00
21-Mar	0.0449	0.00216	0.126	0.00206	0.0479	0.00469	0.12	0.00462	1.60
22-Mar	0.0528	0.00318	0.132	0.00219					5.30
23-Mar	0.0589	0.00365	0.134	0.00213					10.50
24-Mar	0.0379	0.00202	0.127	0.00231					2.70
25-Mar	0.0400	0.0026	0.131	0.0024					4.90
26-Mar	0.0296	0.00203	0.128	0.0025					8.90
27-Mar	0.0269	0.00216							7.50
28-Mar	0.0489	0.00471	0.095	0.00351	0.0416	0.00303	0.13	0.00329	0.00
29-Mar	0.0403	0.00413	0.078	0.00426					3.30
30-Mar	0.0477	0.00451	0.076	0.00485					0.30
31-Mar	0.0358	0.0039	0.0786	0.00427					0.00
Averages	0.0579	0.0054	0.1191	0.0028					2.5067
Total	1.7949	0.1684	3.5727	0.0854					75.2000

April

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01-Apr	0.0463	0.00579	0.0833	0.00402					0.40
02-Apr	0.056	0.00598	0.0862	0.00449					0.90
03-Apr	0.0538	0.00574	0.0845	0.00438					0.40
04-Apr	0.033	0.00294	0.094	0.00272	0.0508	0.00583	0.0827	0.00543	9.90
05-Apr	0.0481	0.0063	0.076	0.00343					30.80
06-Apr	0.0481	0.00577	0.051	0.00277					4.30
07-Apr	0.0292	0.00287	0.0434	0.0037					39.40
08-Apr	0.0566	0.00688	0.0488	0.00301					2.00
09-Apr	0.049	0.00582	0.0506	0.00271					0.50
10-Apr	0.0695	0.0083	0.0513	0.0028					41.90
11-Apr	0.123	0.0135	0.0688	0.00401	0.0503	0.00664	0.0594	0.00394	40.10
12-Apr	0.144	0.0163	0.0617	0.00226					3.50
13-Apr	0.0886	0.00999	0.0625	0.00429					46.10
14-Apr	0.0755	0.00839	0.0758	0.00253					5.70
15-Apr	0.073	0.00753	0.0834	0.00291					0.10
16-Apr	0.0822	0.00856	0.0815	0.00224					0.90
17-Apr	0.0528	0.00547	0.0804	0.00236					0.00
18-Apr	0.064	0.00735	0.0748	0.00252	0.0869	0.00983	0.0724	0.00302	0.00
19-Apr	0.0639	0.00757	0.0776	0.00302					0.00
20-Apr	0.0537	0.00669	0.065	0.00312					16.50
21-Apr	0.0472	0.00678	0.0645	0.00395					4.20
22-Apr	0.0506	0.00725	0.0881	0.00297					0.00
23-Apr	0.051	0.00695	0.0672	0.00294					0.00
24-Apr	0.0447	0.00604	0.057	0.00299					0.00
25-Apr	0.0645	0.0079	0.0399	0.00348	0.0482	0.00635	0.0665	0.00309	0.00
26-Apr	0.0471	0.00485	0.0366	0.00303					0.00
27-Apr	0.0863	0.00911	0.0302	0.00278					0.00
28-Apr	0.0707	0.00779	0.032	0.00189					3.90
29-Apr	0.0607	0.00643	0.0341	0.00195					3.30
30-Apr	0.0534	0.00593	0.0317	0.002					1.50
Averages	0.0629	0.0072	0.0627	0.0030					8.5433
Total	1.8865	0.2168	1.8816	0.0913					256.3000

May

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01-May	0.0497	0.00597	0.0324	0.00166					0.00
02-May	0.0412	0.00416	0.0357	0.00283	0.0609	0.00668	0.0344	0.0025	0.00
03-May	0.0432	0.00462	0.0315	0.00305					0.00
04-May	0.0499	0.00571	0.0366	0.00284					0.10
05-May	0.0501	0.00519	0.0338	0.00287					0.00
06-May	0.041	0.0045	0.0303	0.00289					0.00
07-May	0.0459	0.00531	0.0291	0.00262					0.00
08-May	0.039	0.00436	0.0264	0.00293					2.40
09-May	0.0357	0.00174	0.0311	0.00354	0.0458	0.00495	0.0325	0.00314	0.20
10-May	0.0468	0.00289	0.033	0.00291					0.70
11-May	0.0461	0.0039	0.0258	0.00137					0.00
12-May	0.0442	0.00401	0.024	0.00139					0.00
13-May	0.0516	0.00475	0.0309	0.00276					0.00
14-May	0.0264	0.0032	0.029	0.0024					0.00
15-May	0.0192	0.00386	0.028	0.00261					0.00
16-May	0.0305	0.00311	0.0338	0.0028	0.0333	0.00279	0.0297	0.0025	0.00
17-May	0.0302	0.00228	0.0293	0.00244					0.00
18-May	0.0379	0.00312	0.0263	0.00212					2.30
19-May	0.043	0.00458	0.0264	0.00201					1.30
20-May	0.0551	0.00599	0.0283	0.00184					0.00
21-May	0.0483	0.00544	0.0249	0.00166					0.00
22-May	0.037	0.00971	0.0276	0.00145					0.00
23-May	0.0565	0.00356	0.0271	0.0022	0.0337	0.00328	0.0283	0.00212	0.00
24-May	0.166	0.0115	0.0287	0.00213					0.00
25-May	0.101	0.0111	0.0307	0.00214					0.00
26-May	0.0816	0.0101	0.0305	0.0018					0.00
27-May	0.0744	0.00979	0.0276	0.00177					0.00
28-May	0.0745	0.00914	0.0272	0.00174					0.00
29-May	0.0869	0.0105	0.0299	0.00168					0.00
30-May	0.0518	0.00599	0.029	0.00169	0.0871	0.00925	0.0288	0.00219	1.00
31-May	0.0465	0.00601	0.027	0.00144					0.10
Averages	0.0535	0.0057	0.0295	0.0023					0.2613
Total	1.6047	0.1701	0.8848	0.0681					8.1000

June

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)	Precip. (mm)
01/06/2018	0.04080	0.00500	0.02590	0.00143					8.2
02/06/2018	0.06070	0.00697	0.02280	0.00135					5.9
03/06/2018	0.06140	0.00578	0.02680	0.00146					0.4
04/06/2018	0.09930	0.01160	0.02780	0.00137					0.1
05/06/2018	0.09260	0.01110	0.02600	0.00147					15.8
06/06/2018	0.03780	0.00406	0.02160	0.00163	0.0673	0.00795	0.027	0.00172	3.3
07/06/2018	0.03200	0.00314	0.01960	0.00178					25.7
08/06/2018	0.01840	0.00309	0.01980	0.00211					43.9
09/06/2018	0.01980	0.00280	0.02330	0.00153					0.0
10/06/2018	0.02710	0.00424	0.02450	0.00137					4.2
11/06/2018	0.04490	0.00493	0.02520	0.00127					0.1
12/06/2018	0.03230	0.00212	0.02880	0.00174					3.6
13/06/2018	0.03430	0.00182	0.03540	0.00207	0.0262	0.00235	0.0238	0.00187	5.3
14/06/2018	0.04220	0.00264	0.03580	0.00248					0.0
15/06/2018	0.03420	0.00649	0.03480	0.00188					0.0
16/06/2018	0.02500	0.00230	0.03860	0.00261					0.0
17/06/2018	0.02360	0.00236	0.03150	0.00173					0.0
18/06/2018	0.01930	0.00419	0.02580	0.00269					0.0
19/06/2018	0.02820	0.00320	0.02010	0.00123					0.0
20/06/2018	0.05660	0.00601	0.02090	0.00135	0.0271	0.00353	0.0312	0.00235	0.0
21/06/2018	0.05580	0.00378	0.02340	0.00145					0.0
22/06/2018	0.07380	0.00453	0.02680	0.00150					0.0
23/06/2018	0.06180	0.00520	0.02560	0.00139					0.0
24/06/2018	0.06220	0.00366	0.02640	0.00141					6.1
25/06/2018	0.06680	0.00534	0.03310	0.00202					1.5
26/06/2018	0.06850	0.00497	0.03590	0.00170					0.1
27/06/2018	0.05810	0.00176	0.03490	0.00179	0.0653	0.00538	0.0282	0.00195	0.0
28/06/2018	0.22300	0.00964	0.02940	0.00093					0.6
29/06/2018	0.15600	0.00289	0.02620	0.00093					4.6
30/06/2018	0.21500	0.00935	0.03110	0.00156					1.2
Averages	0.0624	0.0048	0.0276	0.0016					4.3533
Total	1.8715	0.1450	0.8278	0.0492					130.6000

July

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)	MP-EFF-W (T-Zn)	MP-EFF-W (T-Cu)	MC-TP4-W (T-Zn)	MC-TP4-W (T-Cu)
01/07/2018	0.15800	0.00934	0.03100	0.00133	0.00	0.0319	0.00157	0.163	0.00696
02/07/2018	0.15800	0.00843	0.03140	0.00127	0.00				
03/07/2018	0.17900	0.01160	0.03430	0.00207	0.00				
04/07/2018	0.06550	0.00580	0.08710	0.00347	0.00				
05/07/2018	0.04530	0.00161	0.04730	0.00276	0.80				
06/07/2018	0.05120	0.00215	0.04830	0.00223	8.70				
07/07/2018	0.04510	0.00269	0.04850	0.00242	0.20				
08/07/2018	0.08270	0.00722	0.05960	0.00287	0.00				
09/07/2018	0.05790	0.00307	0.05140	0.00560	0.00				
10/07/2018	0.08970	0.00502	0.10200	0.00443	0.00				
11/07/2018	0.09220	0.00532	0.03480	0.00131	0.00				
12/07/2018	0.08080	0.00611	0.03120	0.00104	0.00				
13/07/2018	0.06670	0.00572	0.03620	0.00146	0.00				
14/07/2018	0.07110	0.00656	0.03460	0.00129	0.00				
15/07/2018	0.08630	0.00750	0.03440	0.00134	0.00				
16/07/2018	0.08700	0.00985	0.03330	0.00155	0.00				
17/07/2018	0.09460	0.00699	0.03120	0.00147	0.00				
18/07/2018	0.08040	0.00354	0.05110	0.00158	0.00				
19/07/2018	0.07700	0.00526	0.05410	0.00141	0.00				
20/07/2018	0.07490	0.00555	0.08090	0.00959	0.00				
21/07/2018	0.05320	0.00268	0.05140	0.00147	0.00				
22/07/2018	0.07920	0.00500	0.05700	0.01360	0.00				
23/07/2018	0.08870	0.00584	0.05110	0.00138	0.00				
24/07/2018	0.14100	0.01510	0.05210	0.00158	0.00				
25/07/2018	0.04030	0.00343	0.04590	0.00168	0.00				
26/07/2018	0.04640	0.00229	0.06180	0.00209	0.00				
27/07/2018	0.03730	0.00217	0.04790	0.00222	0.00				
28/07/2018	0.04590	0.00272	0.05070	0.00302	0.00				
29/07/2018	0.05110	0.00512	0.05770	0.00139	0.00				
30/07/2018	0.06540	0.00794	0.05990	0.00148	0.00				
31/07/2018	0.09700	0.00957	0.06870	0.00174	0.00				
Average	0.08029	0.00584	0.05055	0.00265					
Max	0.17900	0.01510	0.10200	0.01360					
Min	0.03730	0.00161	0.03100	0.00104					
Criteria	Permit Limit (PE-06858)		BC WQG						
Max	1.0000	0.6000	0.0330	0.0031					
30 Day Average	n/a	n/a	0.0075	0.00046					
Total	2.4889	0.1812	1.5669	0.0821	9.7000				

August

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)
01/08/2018	0.10200	0.01190	0.05500	0.00224	0.00
02/08/2018	0.05170	0.00532	0.04480	0.00171	0.00
03/08/2018	0.20800	0.02100	0.05980	0.00171	0.00
04/08/2018	0.08390	0.00696	0.06210	0.00188	0.00
05/08/2018	0.24400	0.02380	0.07480	0.00235	0.00
06/08/2018	0.24100	0.02450	0.07330	0.00221	0.00
07/08/2018	0.22500	0.02300	0.07980	0.00284	0.00
08/08/2018	0.05280	0.00294	0.07170	0.00181	0.00
09/08/2018	0.04780	0.00262	0.08070	0.00177	0.00
10/08/2018	0.13100	0.00539	0.09180	0.00218	0.00
11/08/2018	0.18900	0.00742	0.09400	0.00241	9.70
12/08/2018	0.18000	0.00815	0.10100	0.00267	0.00
13/08/2018	0.14700	0.00894	0.10300	0.00245	0.00
14/08/2018	0.22600	0.01690	0.11800	0.00308	0.00
15/08/2018	0.28800	0.00453	0.10500	0.00230	0.00
16/08/2018	0.07640	0.00460	0.11000	0.00258	0.00
17/08/2018	0.08290	0.00703	0.10800	0.00277	0.00
18/08/2018	0.06970	0.00652	0.11000	0.00268	0.00
19/08/2018	0.12600	0.00877	0.12400	0.00301	0.00
20/08/2018	0.12500	0.00967	0.13100	0.00310	0.00
21/08/2018	0.20100	0.01470	0.13400	0.00327	0.00
22/08/2018	0.17500	0.01260	0.10400	0.00211	0.00
23/08/2018	0.19200	0.01420	0.08160	0.00259	0.00
24/08/2018	0.25200	0.02160	0.09660	0.00244	0.00
25/08/2018	0.22600	0.01720	0.11300	0.00205	3.20
26/08/2018	0.18300	0.01440	0.10200	0.00254	0.00
27/08/2018	0.24300	0.01880	0.10500	0.00266	0.00
28/08/2018	0.20100	0.01320	0.10700	0.00307	0.00
29/08/2018	0.16400	0.01250	0.10100	0.00235	0.10
30/08/2018	0.31700	0.02960	0.09400	0.00224	0.00
31/08/2018	0.32400	0.02900	0.10300	0.00273	0.00
Average	0.1734	0.0132	0.0948	0.0024	
Max	0.3240	0.0296	0.1340	0.0033	
Min	0.0478	0.0026	0.0448	0.0017	
Criteria	Permit Limit (PE-06858)		BC WQG		
Max	1.0000	0.6000	0.0330	0.0030	
30 Day Average	n/a	n/a	0.0075	0.00041	

September

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)
01/09/2018	0.32700	0.02770	0.11100	0.00333	0.00
02/09/2018	0.35000	0.02930	0.11300	0.00335	1.10
03/09/2018	0.33900	0.02900	0.10700	0.00347	0.00
04/09/2018	0.35000	0.02960	0.11100	0.00358	0.00
05/09/2018	0.08660	0.00349	0.11200	0.00280	0.00
06/09/2018	0.08350	0.00468	0.11500	0.00318	0.00
07/09/2018	0.07330	0.00446	0.09510	0.00336	15.20
08/09/2018	0.07130	0.00418	0.06820	0.00296	10.50
09/09/2018	0.10100	0.00467	0.05730	0.00435	36.50
10/09/2018	0.10100	0.00815	0.04720	0.00394	47.70
11/09/2018	0.42700	0.02710	0.06510	0.00310	15.20
12/09/2018	0.47800	0.03310	0.06910	0.00342	4.40
13/09/2018	0.18500	0.01370	0.05840	0.00282	0.50
14/09/2018	0.19400	0.01480	0.04610	0.00266	8.00
15/09/2018	0.22000	0.01900	0.04180	0.00320	15.00
16/09/2018	0.23400	0.01880	0.04240	0.00315	11.80
17/09/2018	0.16900	0.01600	0.04640	0.00228	0.10
18/09/2018	0.18700	0.01830	0.05360	0.00325	0.00
19/09/2018	0.04850	0.00186	0.05190	0.00219	6.30
20/09/2018	0.03670	0.00201	0.04310	0.00311	23.90
21/09/2018	0.06980	0.00377	0.04070	0.00443	47.80
22/09/2018	0.07800	0.00260	0.04450	0.00299	5.00
23/09/2018	0.14700	0.00674	0.05020	0.00268	0.10
24/09/2018	0.23600	0.01290	0.05960	0.00260	0.00
25/09/2018	0.25600	0.01550	0.06460	0.00253	0.00
26/09/2018	0.11300	0.00228	0.05590	0.00243	0.00
27/09/2018	0.08400	0.00244	0.05350	0.00229	0.00
28/09/2018	0.05100	0.00163	0.05240	0.00194	0.10
29/09/2018	0.07890	0.00224	0.05400	0.00172	0.00
30/09/2018	0.10100	0.00519	0.04740	0.00341	49.70
Averages	0.1759	0.0122	0.0659	0.0030	
Max	0.4780	0.0331	0.1150	0.0044	
Min	0.0367	0.0016	0.0407	0.0017	
Criteria	Permit Limit (PE-06858)		BC WQG		
Max	1.0000	0.6000	0.0330	0.0031	
30 Day Average	n/a	n/a	0.0075	0.00046	

October

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)
01/10/2018	0.05480	0.00357	0.04550	0.00256	6.40
02/10/2018	0.13200	0.01110	0.05230	0.00221	0.70
03/10/2018	0.08730	0.00130	0.05870	0.00276	0.10
04/10/2018	0.05840	0.00150	0.05730	0.00205	0.00
05/10/2018	0.03580	0.00207	0.05890	0.00179	6.60
06/10/2018	0.04820	0.00340	0.06190	0.00203	0.00
07/10/2018	0.06490	0.00447	0.05880	0.00206	15.00
08/10/2018	0.07480	0.00636	0.05900	0.00225	1.20
09/10/2018	0.10400	0.00941	0.05560	0.00183	0.10
10/10/2018	0.14200	0.00300	0.07140	0.00235	0.00
11/10/2018	0.15100	0.00407	0.08740	0.00245	0.10
12/10/2018	0.13900	0.00490	0.08430	0.00231	0.00
13/10/2018	0.14600	0.00702	0.02300	0.00023	0.00
14/10/2018	0.19400	0.01030	0.08580	0.00227	0.00
15/10/2018	0.26800	0.01930	0.09280	0.00285	0.00
16/10/2018	0.24300	0.01770	0.09650	0.00269	0.00
17/10/2018	0.17700	0.00308	0.08820	0.00297	0.00
18/10/2018	0.15800	0.00415	0.07020	0.00515	0.00
19/10/2018	0.21300	0.00665	0.06460	0.00411	0.00
20/10/2018	0.21200	0.00671	0.06820	0.00353	0.00
21/10/2018	0.20900	0.00796	0.08660	0.00260	0.00
22/10/2018	0.18100	0.00891	0.07910	0.00225	0.00
23/10/2018	0.23400	0.01460			4.40
24/10/2018	0.17600	0.00319	0.12500	0.00644	20.40
25/10/2018	0.12700	0.00259	0.07200	0.01130	18.50
26/10/2018	0.06750	0.00243	0.06470	0.01230	12.00
27/10/2018	0.05070	0.00306	0.07580	0.01070	12.50
28/10/2018	0.06830	0.00513	0.06510	0.01360	16.80
29/10/2018	0.09020	0.00890	0.05830	0.01190	9.50
30/10/2018	0.17400	0.01410	0.06220	0.00981	11.20
31/10/2018					
Averages	0.1360	0.0067	0.0700	0.0045	1.9000
Max	0.2680	0.0193	0.1250	0.0136	
Min	0.0358	0.0013	0.0230	0.0002	4.5167
Criteria	Permit Limit (PE-06858)		BC WQG		135.5000
Max	1.0000	0.6000	0.0330	0.0031	
30 Day Average	n/a	n/a	0.0075	0.00046	

November

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)
01/11/2018	0.09580	0.00274	0.04430	0.01360	54.50
02/11/2018	0.08630	0.00248	0.06120	0.01280	2.20
03/11/2018	0.05560	0.00331	0.04990	0.01670	60.00
04/11/2018	0.06170	0.00370	0.06350	0.01440	5.20
05/11/2018	0.11800	0.00927	0.06440	0.01420	5.70
06/11/2018	0.20200	0.01660	0.07020	0.01260	0.20
07/11/2018	0.28800	0.00618	0.07940	0.00601	0.10
08/11/2018	0.36600	0.02520	0.07610	0.00565	0.20
09/11/2018	0.18100	0.00370	0.07840	0.00543	4.40
10/11/2018	0.12900	0.00385	0.07870	0.00500	0.10
11/11/2018	0.12100	0.00237	0.07070	0.00506	0.00
12/11/2018	0.15700	0.01090	0.07910	0.00521	0.00
13/11/2018	0.11500	0.00128	0.05910	0.00249	35.90
14/11/2018	0.07830	0.00102	0.05240	0.00531	26.20
15/11/2018	0.07740	0.00153	0.05390	0.00720	8.80
16/11/2018	0.06670	0.00137	0.05720	0.00605	0.00
17/11/2018	0.06650	0.00095	0.06050	0.00609	0.10
18/11/2018	0.06960	0.00089	0.06430	0.00443	0.30
19/11/2018	0.08210	0.00095	0.06610	0.00438	0.10
20/11/2018	0.11400	0.00573	0.07340	0.00635	0.00
21/11/2018	0.10800	0.00278	0.05260	0.01020	17.50
22/11/2018	0.11000	0.00266	0.05620	0.00261	17.50
23/11/2018	0.05030	0.00267	0.05110	0.00493	19.60
24/11/2018	0.07720	0.00485	0.05370	0.00363	5.40
25/11/2018	0.09090	0.00575	0.05190	0.00662	3.20
26/11/2018	0.12500	0.01350	0.04140	0.00606	27.70
27/11/2018	0.21500	0.02570	0.06000	0.00496	89.10
28/11/2018	0.14200	0.00245	0.06790	0.00828	35.20
29/11/2018	0.19000	0.00242	0.08230	0.00278	4.90
30/11/2018	0.13100	0.00246	0.07650	0.00420	0.40
Average	0.1257	0.0056	0.0632	0.0071	14.1500 424.5000
Max	0.3660	0.0257	0.0823	0.0167	
Min	0.0503	0.0009	0.0414	0.0025	
Criteria	Permit Limit (PE-06858)		BC WQG		
Max	1.0000	0.6000	0.0330	0.0030	
30 Day Average	n/a	n/a	0.0075	0.00041	

December

2018

DATE	MP-EFF-D (T-Zn)	MP-EFF-D (T-Cu)	MC-TP4-D (T-Zn)	MC-TP4-D (T-Cu)	Precip. (mm)
01/12/2018	0.11100	0.00281	0.08270	0.00365	0.00
02/12/2018	0.15600	0.00368	0.08300	0.00412	0.10
03/12/2018	0.15500	0.00413	0.09110	0.00276	0.00
04/12/2018	0.16100	0.00513	0.09020	0.00325	0.00
05/12/2018	0.15800	0.00597	0.09420	0.00251	0.00
06/12/2018	0.16100	0.00648			0.00
07/12/2018	0.12400	0.00630	0.09850	0.00233	0.00
08/12/2018	0.11800	0.00646	0.09460	0.00227	2.90
09/12/2018	0.10700	0.00677	0.07690	0.00374	54.40
10/12/2018	0.10100	0.00884	0.08270	0.00389	16.80
11/12/2018	0.15400	0.01880	0.07160	0.00387	51.00
12/12/2018	0.05010	0.00268	0.08990	0.00778	50.30
13/12/2018	0.03610	0.00311	0.07800	0.00419	59.40
14/12/2018	0.04750	0.00330	0.10200	0.00700	77.40
15/12/2018	0.05950	0.00413	0.12100	0.01790	24.60
16/12/2018	0.06990	0.00703	0.11900	0.00573	72.60
17/12/2018	0.09840	0.01030	0.12700	0.00499	78.30
18/12/2018	0.21200	0.02470	0.13400	0.00507	45.00
19/12/2018	0.09270	0.00411	0.10500	0.00483	15.10
20/12/2018	0.16100	0.00593	0.10000	0.00356	70.80
21/12/2018	0.20200	0.01430	0.11600	0.00411	0.10
22/12/2018	0.28900	0.03690	0.11300	0.00331	29.10
23/12/2018	0.18000	0.00911	0.11600	0.00382	25.90
24/12/2018	0.19600	0.01300	0.12700	0.00329	2.70
25/12/2018	0.24800	0.01940	0.12200	0.00331	0.00
26/12/2018	0.26300	0.00549	0.12200	0.00384	4.50
27/12/2018	0.21100	0.00537	0.12400	0.00250	2.00
28/12/2018	0.21900	0.00548	0.12000	0.00310	21.00
29/12/2018	0.21400	0.00672	0.08420	0.00467	29.00
30/12/2018	0.29100	0.01150	0.25200	0.02150	0.10
31/12/2018	0.39900	0.02050	0.11500	0.00356	0.10
Average	0.1627	0.0093	0.1084	0.0050	
Max	0.3990	0.0369	0.2520	0.0215	
Min	0.0361	0.0027	0.0716	0.0023	
Criteria	Permit Limit (PE-06858)		BC WQG		
Max	1.0000	0.6000	0.0330	0.0030	
30 Day Average	n/a	n/a	0.0075	0.00041	

Total Aluminum (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.2980			0.0585	0.0514	0.0139	0.0186
February	0.0237		0.0185	N.A.	N.A.	0.0331	0.0307	0.0042	0.0347
March		16.00	0.1440			0.0488	0.0433	0.0114	0.0195
April			0.2560			0.0572	0.0504	0.0041	0.0717
May	0.0654		0.1740	N.A.	N.A.	0.0537	0.0478	0.0267	0.0213
June		37.6000	0.3070			0.0539	0.0482	0.0164	0.0162
July		DRY	0.2020			0.0501	0.0453	0.0052	0.0197
August	0.0194	DRY	0.2520	1.4500	2.5700	0.0647	0.0526	0.0069	0.0457
September		DRY	0.2400			0.0762	0.0619	0.0249	0.0384
October		DRY	0.37			0.0729	0.0716	0.149	0.1450
November	0.0398	0.0362	0.399	2.15	3.08	0.0676	0.0562	0.00437	0.0163
December		1.3000	0.646			0.076	0.0893	0.0278	0.022

Mean	0.0371	13.7341	0.2755	1.8000	2.8250	0.0594	0.0541	0.0246	0.0391
Minimum	0.0194	0.0362	0.0185	1.4500	2.5700	0.0331	0.0307	0.0041	0.0162
Maximum	0.0654	37.6000	0.6460	2.1500	3.0800	0.0762	0.0893	0.1490	0.1450
Median	0.0318	8.6500	0.2540	1.8000	2.8250	0.0579	0.0509	0.0127	0.0217
Stdev	0.0208	17.4829	0.1550	0.4950	0.3606	0.0128	0.0149	0.0402	0.0371
n	4	4	12	2	2	12	12	12	12
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
BC WQG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Dissolved Aluminum (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.191			0.0501	0.042	0.00597	0.0108
February	0.0213		0.00492			0.0298	0.0268	0.00278	0.0102
March		16.1	0.11			0.0419	0.0366	0.00395	0.0132
April			0.202			0.0504	0.0429	0.0029	0.01
May	0.0556		0.167			0.0535	0.0487	0.00548	0.0105
June		34.2	0.246			0.0491	0.0419	0.0001	0.0145
July		DRY	0.166			0.0318	0.0298	0.00336	0.0136
August	0.0178	DRY	0.127	0.231	0.802	0.0386	0.0342	0.00455	0.0175
September		DRY	0.151			0.0553	0.0478	0.0038	0.0131
October		DRY	0.266			0.0534	0.0524	0.00274	0.0117
November	0.0382	0.0304	0.252	0.0488	0.68	0.0214	0.0443	0.00339	0.0143
December		0.067	0.539			0.0712	0.0628	0.0061	0.0131

Mean	0.0332	12.5994	0.2018	0.1399	0.7410	0.0455	0.0425	0.0038	0.0127
Minimum	0.0178	0.0304	0.0049	0.0488	0.6800	0.0214	0.0268	0.0001	0.0100
Maximum	0.0556	34.2000	0.5390	0.2310	0.8020	0.0712	0.0628	0.0061	0.0175
Median	0.0298	8.0835	0.1790	0.1399	0.7410	0.0496	0.0425	0.0036	0.0131
Stdev	0.0174	16.2674	0.1280	0.1288	0.0863	0.0135	0.0100	0.0017	0.0022
n	4	4	12	2	2	12	12	12	12
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
BC WQG max	0.10	n/a	n/a	n/a	n/a	0.10	0.10	n/a	0.10
BC WQG 30 day	0.050	n/a	n/a	n/a	n/a	0.050	0.050	n/a	0.050

Total Cadmium (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0004870			0.0001520	0.0001560	0.0003980	0.0000168
February	0.0000050		0.0001110			0.0002360	0.0002330	0.0008810	0.0000159
March		0.2250000	0.0001200			0.0001750	0.0001660	0.0006010	0.0000203
April			0.0001440			0.0001830	0.0001750	0.0005710	0.0000177
May	0.0000050		0.0001480			0.0000467	0.0000442	0.0006810	0.0000342
June		0.2150000	0.0002410			0.0000271	0.0000294	0.0003830	0.0000174
July		DRY	0.0006580			0.0001270	0.0001110	0.0011300	0.0000116
August	0.0000050	DRY	0.0010100	0.0217000	0.0150000	0.0002810	0.0002200	0.0012600	0.0000132
September		DRY	0.0010600			0.0003990	0.0003340	0.0004580	0.0000166
October		DRY	0.0007080			0.0001600	0.0001580	0.0009120	0.0000227
November	0.0000632	0.0001820	0.0013800	0.1920000	0.0201000	0.0002100	0.0002190	0.0010100	0.0000140
December		0.0016600	0.0010600			0.0001730	0.0002250	0.0013000	0.0000150
Mean	0.000020	0.110461	0.000594	0.1069	0.0176	0.000181	0.000173	0.000799	0.000018
Minimum	0.000005	0.000182	0.000111	0.0217	0.0150	0.000027	0.000029	0.000383	0.000012
Maximum	0.000063	0.225000	0.001380	0.1920	0.0201	0.000399	0.000334	0.001300	0.000034
Median	0.000005	0.108330	0.000573	0.1069	0.0176	0.000174	0.000171	0.000781	0.000017
Stdev	0.000029	0.126553	0.000451	0.1204	0.0036	0.000099	0.000084	0.000329	0.000006
n	4	4	12	2	2	12	12	12	12
DL Range	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050
BC WQG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Dissolved Cadmium (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0001500			0.0001440	0.0001500	0.0003950	0.0000155
February	0.0000108		0.0000365			0.0002170	0.0002230	0.0008320	0.0000176
March		0.2150000	0.0000228			0.0001650	0.0001710	0.0005940	0.0000170
April			0.0000162			0.0001720	0.0001680	0.0005380	0.0000187
May	0.0000050		0.0000209			0.0000401	0.0000483	0.0005190	0.0000185
June		0.2260000	0.0000726			0.0000251	0.0000263	0.0001000	0.0000143
July		DRY	0.0002570			0.0000995	0.0000996	0.0011000	0.0000112
August	0.0000050	DRY	0.0002030	0.0000482	0.0154000	0.0002360	0.0001970	0.0012900	0.0000099
September		DRY	0.0002450			0.0003290	0.0002990	0.0004310	0.0000086
October		DRY	0.0001040			0.0001380	0.0001290	0.0005730	0.0000138
November	0.0002480	0.0001870	0.0003670	0.0449000	0.0196000	0.0002520	0.0002000	0.0010400	0.0000118
December		0.0015500	0.0001460			0.0001430	0.0001800	0.0012200	0.0000150
Mean	0.000067	0.110684	0.000137	0.0225	0.0175	0.000163	0.000158	0.000719	0.000014
Minimum	0.000005	0.000187	0.000016	0.0000	0.0154	0.000025	0.000026	0.000100	0.000009
Maximum	0.000248	0.226000	0.000367	0.0449	0.0196	0.000329	0.000299	0.001290	0.000019
Median	0.000008	0.108275	0.000125	0.0225	0.0175	0.000155	0.000170	0.000584	0.000015
Stdev	0.000121	0.126885	0.000113	0.0317	0.0030	0.000087	0.000075	0.000372	0.000003
n	4	4	12	2	2	12	12	12	12
DL Range	0.0000050	0.0000050	0.0000050	0.0030	0.0030	0.0000050	0.0000050	0.0000050	0.0000050
Permit Limit	WQG	0.003	0.005	n/a	n/a	WQG	WQG	0.005	WQG

Total Calcium (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			113.00			18.40	18.70	14.40	8.62
February	6.63		147.00			29.50	29.80	40.40	10.50
March		81.20	103.00			22.90	22.30	37.60	9.60
April			97.10			20.60	20.60	41.20	9.54
May	2.32		95.30			8.44	8.64	37.70	8.65
June		113.00	79.60			5.97	6.35	31.30	9.06
July		DRY	84.90			13.70	14.80	40.70	8.23
August	3.87	DRY	82.40	259.00	61.90	23.10	20.10	41.40	8.00
September		DRY	87.10			31.20	34.60	38.40	8.26
October		DRY	108.00			24.60	24.40	42.30	9.06
November	5.22	16.30	101.00	64.00	73.30	16.90	17.30	39.90	9.00
December		23.10	118.00			10.70	13.60	34.10	8.84

[illegible]

Dissolved Calcium (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			117.00			17.70	17.70	12.10	8.72
February	7.10		145.00			31.00	30.10	40.70	8.80
March		81.00	126.00			23.10	24.00	39.90	9.69
April			89.10			19.20	19.90	37.90	9.16
May	2.37		101.00			8.84	9.36	39.20	8.56
June		117.00	78.60			6.09	6.30	40.00	8.23
July		DRY	88.20			14.20	15.00	42.80	8.70
August	4.17	DRY	86.70	172.00	67.20	24.30	20.80	43.50	8.66
September		DRY	87.00			32.60	35.70	40.10	8.36
October		DRY	110.00			24.50	24.50	39.50	9.06
November	5.41	17.60	101.00	55.20	73.00	16.80	18.30	42.10	9.26
December		21.80	106.00			10.80	13.20	30.50	8.87

[illegible]

Total Copper (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.012700			0.003440	0.003250	0.002480	0.000783
February	0.000110		0.002070			0.004040	0.003610	0.001660	0.001150
March		4.750000	0.004610			0.003940	0.003410	0.001490	0.000686
April			0.005120			0.003990	0.003570	0.001610	0.000649
May	0.000285		0.005170			0.000930	0.001020	0.002820	0.000817
June		7.010000	0.008620			0.000782	0.000787	0.002900	0.000498
July		DRY	0.012500			0.002570	0.001810	0.002120	0.000508
August	0.000054	DRY	0.029100	0.677000	0.578000	0.006770	0.004540	0.002440	0.000736
September		DRY	0.028500			0.009070	0.005070	0.002430	0.000633
October		DRY	0.018600			0.003090	0.003590	0.006560	0.001220
November	0.000238	0.007020	0.030200	3.560000	0.679000	0.003950	0.003760	0.002050	0.000488
December		0.067800	0.026800			0.003570	0.005240	0.004750	0.000720

Mean	0.00017	2.95871	0.01533	2.12	0.63	0.00385	0.00330	0.00278	0.00074
Minimum	0.00005	0.00702	0.00207	0.68	0.58	0.00078	0.00079	0.00149	0.00049
Maximum	0.00029	7.01000	0.03020	3.56	0.68	0.00907	0.00524	0.00656	0.00122
Median	0.00017	2.40890	0.01260	2.12	0.63	0.00376	0.00358	0.00244	0.00070
Stdev	0.00011	3.49721	0.01081	2.04	0.07	0.00226	0.00143	0.00147	0.00023
n	4	4	12	2	2	12	12	12	12
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
BC WQG max	0.00313	0.3	0.5	n/a	n/a	0.00313	0.00313	0.6	0.00442285
BC WQG 30 day	0.00048					0.00048	0.00048		0.001028

Dissolved Copper (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.000825			0.002270	0.002500	0.002260	0.000565
February	0.000477		0.000498			0.002600	0.002400	0.001590	0.000194
March		4.810000	0.000821			0.008470	0.003000	0.001370	0.000628
April			0.000803			0.003330	0.002960	0.001440	0.000597
May	0.000128		0.000949			0.000828	0.000927	0.002020	0.000599
June		7.660000	0.001330			0.001080	0.000558	0.000100	0.000475
July		DRY	0.002080			0.001340	0.001340	0.002090	0.000483
August	0.000067	DRY	0.001320	0.005060	0.602000	0.002180	0.002020	0.002370	0.000499
September		DRY	0.001940			0.002900	0.002410	0.002090	0.000432
October		DRY	0.001410			0.001530	0.001690	0.001470	0.000456
November	0.000212	0.007850	0.002330	0.086300	0.586000	0.007680	0.002450	0.001940	0.000493
December		0.012000	0.001420			0.002320	0.003210	0.002220	0.000550

Mean	0.00022	3.12246	0.00131	0.05	0.59	0.00304	0.00212	0.00175	0.00050
Minimum	0.00007	0.00785	0.00050	0.01	0.59	0.00083	0.00056	0.00010	0.00019
Maximum	0.00048	7.66000	0.00233	0.09	0.60	0.00847	0.00321	0.00237	0.00063
Median	0.00017	2.41100	0.00133	0.05	0.59	0.00230	0.00241	0.00198	0.00050
Stdev	0.00018	3.77769	0.00057	0.06	0.01	0.00247	0.00084	0.00062	0.00011
n	4	4	12	2	2	12	12	12	12
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Permit Limit	n/a	0.1	0.2	n/a	n/a	n/a	n/a	0.20	n/a

Total Iron (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.1210			0.0162	0.0137	0.0277	0.0124
February	0.0050		0.0077			0.0052	0.0061	0.0017	0.0506
March		140.0000	0.0532			0.0150	0.0112	0.0159	0.0149
April			0.0288			0.0067	0.0065	0.0048	0.0106
May	0.0135		0.0207			0.0087	0.0074	0.0461	0.0174
June		291.0000	0.0699			0.0143	0.0105	0.0305	0.0075
July		DRY	0.0312			0.0163	0.0068	0.0022	0.0110
August	0.0025	DRY	0.1710	2.3700	1.2600	0.0327	0.0228	0.0103	0.0475
September		DRY	0.1080			0.0296	0.0114	0.0418	0.0468
October		DRY	0.1250			0.0231	0.0210	0.2240	0.1440
November	0.0095	0.0117	0.1420	9.3600	2.7300	0.0266	0.0159	0.0051	0.0084
December		0.2980	0.2900			0.0240	0.0490	0.0290	0.0120
Mean	0.008	107.827	0.097	5.87	2.00	0.018	0.015	0.037	0.032
Minimum	0.003	0.012	0.008	2.37	1.26	0.005	0.006	0.002	0.008
Maximum	0.014	291.000	0.290	9.36	2.73	0.033	0.049	0.224	0.144
Median	0.007	70.149	0.089	5.87	2.00	0.016	0.011	0.022	0.014
Stdev	0.005	138.773	0.081	4.94	1.04	0.009	0.012	0.061	0.039
n	4	4	12	2	2	12	12	12	12
DL Range	0.005	0.005	0.030	0.030	0.030	0.030	0.030	0.030	0.030
BC WQG max	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Dissolved Iron (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0010			0.0029	0.0039	0.0034	0.0031
February	0.0021		0.0010			0.0017	0.0013	0.0010	0.0016
March		141.0000	0.0010			0.0036	0.0032	0.0032	0.0043
April			0.0010			0.0029	0.0031	0.0029	0.0040
May	0.0079		0.0010			0.0059	0.0048	0.0056	0.0039
June		276.0000	0.0037			0.0117	0.0053	0.0049	0.0001
July		DRY	0.0010			0.0014	0.0023	0.0017	0.0053
August	0.0001	DRY	0.0013	0.0051	0.9180	0.0020	0.0017	0.0016	0.0128
September		DRY	0.0064			0.0078	0.0016	0.0109	0.0100
October		DRY	0.0013			0.0025	0.0038	0.0043	0.0033
November	0.0029	0.0034	0.0011	0.0139	1.6800	0.0061	0.0056	0.0016	0.0048
December		0.0100	0.0100			0.0100	0.0100	0.0100	0.0100
Mean	0.003	104.253	0.002	0.01	1.30	0.005	0.004	0.004	0.005
Minimum	0.000	0.003	0.001	0.01	0.92	0.001	0.001	0.001	0.000
Maximum	0.008	276.000	0.010	0.01	1.68	0.012	0.010	0.011	0.013
Median	0.003	70.505	0.001	0.01	1.30	0.003	0.004	0.003	0.004
Stdev	0.003	132.391	0.003	0.01	0.54	0.003	0.002	0.003	0.004
n	4	4	12	2	2	12	12	12	12
DL Range	0.030	0.030	0.001	0.030	0.030	0.030	0.030	0.001	0.030
BC WQG max	0.35	N/A	N/A	N/A	N/A	0.35	0.35	N/A	0.35

Total Lead (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0005240			0.0000854	0.0000687	0.0014500	0.0002530
February	0.0000270		0.0001380			0.0000747	0.0000676	0.0015600	0.0000510
March		0.6470000	0.0012500			0.0002230	0.0001530	0.0011200	0.0000504
April			0.0002830			0.0000705	0.0000947	0.0007350	0.0000398
May	0.0000093		0.0006380			0.0000674	0.0000629	0.0025400	0.0000998
June		0.7990000	0.0020100			0.0001570	0.0002490	0.0014300	0.0000051
July		DRY	0.0023900			0.0009050	0.0003510	0.0023500	0.0000216
August	0.0000143	DRY	0.0037100	0.1080000	0.0062000	0.0007150	0.0005830	0.0036500	0.0002080
September		DRY	0.0147000			0.0025800	0.0009030	0.0013500	0.0001030
October		DRY	0.0015300			0.0002430	0.0002860	0.0130000	0.0001630
November	0.0001290	0.0005420	0.0221000	14.2000000	0.0096700	0.0020400	0.0011300	0.0024000	0.0000050
December		0.0012500	0.0097900			0.0006100	0.0011700	0.0056800	0.0002000

Mean	0.000045	0.361948	0.004922	7.154	0.008	0.000648	0.000427	0.003105	0.000100
Minimum	0.000009	0.000542	0.000138	0.108	0.006	0.000067	0.000063	0.000735	0.000005
Maximum	0.000129	0.799000	0.022100	14.200	0.010	0.002580	0.001170	0.013000	0.000253
Median	0.000021	0.324125	0.001770	7.154	0.008	0.000233	0.000268	0.001955	0.000075
Stdev	0.000057	0.421500	0.006992	9.965	0.002	0.000834	0.000419	0.003395	0.000086
n	4	4	12	2	2	12	12	12	12
DL Range	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
BC WQG max	0.00554					0.00554	0.00554		0.01457
BC WQG 30	0.00071					0.00071	0.00071		0.00189

Dissolved Lead (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.0000050			0.0000332	0.0001610	0.0004980	0.0000263
February	0.0000050		0.0000203			0.0000332	0.0000266	0.0014100	0.0000137
March		0.6440000	0.0000348			0.0001710	0.0000450	0.0007050	0.0000440
April			0.0000061			0.0000466	0.0000430	0.0005830	0.0000228
May	0.0000107		0.0000110			0.0000202	0.0000539	0.0008450	0.0000200
June		0.7280000	0.0001520			0.0003000	0.0000219	0.0001000	0.0000427
July		DRY	0.0001030			0.0000487	0.0000525	0.0022000	0.0000050
August	0.0025000	DRY	0.0000241	0.0237000	0.0004970	0.0000428	0.0000416	0.0027400	0.0000050
September		DRY	0.0003150			0.0001580	0.0001270	0.0006880	0.0000142
October		DRY	0.0000109			0.0000269	0.0000361	0.0007850	0.0000050
November	0.0000217	0.0003210	0.0000390	0.0086600	0.0040400	0.0002810	0.0000706	0.0019900	0.0000207
December		0.0002000	0.0002000			0.0002000	0.0002000	0.0022100	0.0002000

Mean	0.000634	0.343130	0.000077	0.016	0.002	0.000113	0.000073	0.001230	0.000035
Minimum	0.000005	0.000200	0.000005	0.009	0.000	0.000020	0.000022	0.000100	0.000005
Maximum	0.002500	0.728000	0.000315	0.024	0.004	0.000300	0.000200	0.002740	0.000200
Median	0.000016	0.322161	0.000029	0.016	0.002	0.000048	0.000049	0.000815	0.000020
Stdev	0.001244	0.397394	0.000098	0.011	0.003	0.000104	0.000058	0.000850	0.000054
n	4	4	12	2	2	12	12	12	12
DL Range	0.000005	0.000005	0.000005	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Permit Limit	n/a	0.03	0.05	n/a	n/a	n/a	n/a	0.05	n/a

Total Phosphorus (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January							0.00310		
February			0.00320				0.00200		
March		0.34300					0.00200		
April							0.00220		
May	0.00200		0.00340				0.00320		
June		1.40000					0.00200		
July							0.00200		
August	0.00210	DRY	0.00290	0.00630	0.03950		0.01370		
September		DRY					0.00330		
October		DRY					0.00400		
November	0.00200	0.00220	0.0059	0.107	0.0062		0.00200		
December		0.00310					0.00200		

Mean	0.002	0.437	0.003	0.006	0.040	-	0.003	-	-
Minimum	0.002	0.002	0.003	0.006	0.040	0.000	0.002	0.000	0.000
Maximum	0.002	1.400	0.003	0.006	0.040	0.000	0.014	0.000	0.000
Median	0.002	0.173	0.003	0.006	0.040	-	0.002	-	-
Stdev	0.000	0.662	0.000	-	-	-	0.003	-	-
n	3.000	4.000	3.000	1.000	1.000	0.000	12.000	0.000	0.000
DL Range	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
BC WQG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Dissolved Phosphorus (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January							0.0031		
February							0.0020		
March							0.0020		
April							0.0042		
May							0.0024		
June							0.0020		
July							0.0020		
August							0.0070		
September							0.0023		
October							0.0031		
November							0.0022		
December							0.0020		

Mean	-	-	-	-	-	-	0.003	-	-
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.002	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.007	0.00	0.00
Median	-	-	-	-	-	-	0.002	-	-
Stdev	-	-	-	-	-	-	0.001	-	-
n	0	0	0	0	0	0	12	0	0
DL Range	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
BC WQG	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a

Total Zinc (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.14500			0.06700	0.06740	0.09360	0.00637
February	0.00100		0.03430			0.11000	0.10300	0.13100	0.01010
March		37.40000	0.03510			0.08160	0.07310	0.09490	0.01200
April			0.04570			0.08340	0.07850	0.09830	0.00665
May	0.00082		0.04980			0.01600	0.01630	0.10700	0.00580
June		31.90000	0.07910			0.00987	0.01050	0.05290	0.00447
July		DRY	0.18300			0.03680	0.03310	0.16100	0.00322
August	0.00010	DRY	0.32500	8.00000	5.61000	0.09320	0.07000	0.18200	0.00303
September		DRY	0.33000			0.13200	0.08950	0.08300	0.00251
October		DRY	0.19700			0.04510	0.04910	0.21400	0.00530
November	0.00073	0.03060	0.36300	51.80	5.45	0.06110	0.06390	0.20500	0.00358
December		0.35300	0.206			0.04400	0.06060	0.26000	0.00650

Mean	0.0007	17.4209	0.1661	29.90	5.53	0.0650	0.0596	0.1402	0.0058
Minimum	0.0001	0.0306	0.0343	8.00	5.45	0.0099	0.0105	0.0529	0.0025
Maximum	0.0010	37.4000	0.3630	51.80	5.61	0.1320	0.1030	0.2600	0.0120
Median	0.0008	16.1265	0.1640	29.90	5.53	0.0641	0.0657	0.1190	0.0056
Stdev	0.0004	20.0212	0.1222	30.97	0.11	0.0369	0.0280	0.0634	0.0029
n	4	4	12	2	2	12	12	12	12
Permit Limit		0.5	1	n/a	n/a			1	
BC WQG max	0.0330					0.033	0.033		0.033
BC WQG 30 day	0.0075					0.0075	0.0075		0.0075

Dissolved Zinc (mg/L)	MC -M1 0124784	TDF Effluent E207740	Myra Ponds E100666	Mill Ditch E311028	Dissipater E311488	MC TP4 E206805	MC-M2 0124785	Price 13L E100662	Gold River Bridge 0130080
January			0.01690			0.05860	0.06340	0.09490	0.00540
February	0.00990		0.00204			0.09500	0.09740	0.12800	0.00619
March		34.40000	0.00187			0.07670	0.07530	0.09950	0.00782
April			0.00294			0.08050	0.07690	0.09440	0.00601
May	0.00042		0.00449			0.01580	0.01600	0.08500	0.00487
June		32.70000	0.01270			0.00952	0.00892	0.00010	0.00454
July		DRY	0.05250			0.03080	0.03100	0.16800	0.00320
August	0.00010	DRY	0.02540	0.37000	5.79000	0.05970	0.05380	0.19100	0.00183
September		DRY	0.04220			0.08940	0.07480	0.08130	0.00149
October		DRY	0.01740			0.03410	0.03740	0.15100	0.00330
November	0.00054	0.03280	0.06200	12.90000	5.16000	0.06610	0.05410	0.21300	0.00339
December		0.28100	0.01070			0.03900	0.05010	0.23200	0.00550

Mean	0.0027	16.8535	0.0209	6.64	5.48	0.0546	0.0533	0.1282	0.0045
Minimum	0.0001	0.0328	0.0019	0.37	5.16	0.0095	0.0089	0.0001	0.0015
Maximum	0.0099	34.4000	0.0620	12.90	5.79	0.0950	0.0974	0.2320	0.0078
Median	0.0005	16.4905	0.0148	6.64	5.48	0.0592	0.0540	0.1138	0.0047
Stdev	0.0048	19.2923	0.0206	8.86	0.45	0.0285	0.0264	0.0658	0.0019
n	4	4	12	2	2	12	12	12	12
DL Range	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Permit Limit	n/a	0.3	0.5	n/a	n/a	n/a	n/a	0.5	n/a

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Appendix E
Buttle Lake Water Quality

Total Cadmium (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.0315000	0.0000571	0.0000590	0.0000640	0.0000714		0.0000250		0.0000220	0.0000217	0.0000265	0.0000306
April	0.0000438	0.0000357	0.0000392	0.0000484	0.0000558		0.0000250		0.0000259	0.0000238	0.0000278	0.0000242
June	0.0000157	0.0000164	0.0000234	0.0000421	0.0000486		0.0000145		0.0000193	0.0000269	0.0000204	0.0000268
August	0.0000134	0.0000214	0.0000264	0.0000457	0.0000472		0.0000148		0.0000261	0.0000217	0.0000242	0.0000549
October	0.0000171	0.0000197	0.0000240	0.0000344	0.0000295	0.0000491	0.0000155	0.0000153	0.0000223	0.0000210	0.0000255	0.0007980
December	0.0000220	0.0000240	0.0000410	0.0000310	0.0000490	0.0000410	0.0000400	0.0000210	0.0000260	0.0000280	0.0000470	0.0000280
Mean	0.0052687	0.0000291	0.0000355	0.0000443	0.0000503	0.0000451	0.0000225	0.0000182	0.0000236	0.0000239	0.0000286	0.0001604
Minimum	0.0000134	0.0000164	0.0000234	0.0000310	0.0000295	0.0000410	0.0000145	0.0000153	0.0000193	0.0000210	0.0000204	0.0000242
Maximum	0.0315000	0.0000571	0.0000590	0.0000640	0.0000714	0.0000491	0.0000400	0.0000210	0.0000261	0.0000280	0.0000470	0.0007980
Median	0.0000196	0.0000227	0.0000328	0.0000439	0.0000488	0.0000451	0.0000203	0.0000182	0.0000241	0.0000228	0.0000260	0.0000293
Stdev	0.0128507	0.0000152	0.0000138	0.0000117	0.0000136	0.0000057	0.0000099	0.0000040	0.0000028	0.0000030	0.0000094	0.0003126
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050
BC WQG	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Dissolved Cadmium (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.0000498	0.0000539	0.0000562	0.0000590	0.0000694		0.0000251		0.0000228	0.0000244	0.0000224	0.0000262
April	0.0000440	0.0000363	0.0000429	0.0000479	0.0000517		0.0000255		0.0000220	0.0000210	0.0000214	0.0000246
June	0.0000159	0.0000138	0.0000222	0.0000362	0.0000404		0.0000162		0.0000207	0.0000223	0.0000165	0.0000229
August	0.0000100	0.0000163	0.0000236	0.0000365	0.0000394		0.0000117		0.0000225	0.0000229	0.0000208	0.0000125
October	0.0000145	0.0000149	0.0000210	0.0000340	0.0000310	0.0000440	0.0000163	0.0000140	0.0000233	0.0000050	0.0000263	0.0000282
December	0.0000240	0.0000250	0.0000340	0.0000240	0.0000460	0.0000440	0.0000210	0.0000200	0.0000220	0.0000180	0.0000230	0.0000240
Mean	0.0000264	0.0000267	0.0000333	0.0000396	0.0000463	0.0000440	0.0000193	0.0000170	0.0000222	0.0000189	0.0000217	0.0000231
Minimum	0.0000100	0.0000138	0.0000210	0.0000240	0.0000310	0.0000440	0.0000117	0.0000140	0.0000207	0.0000050	0.0000165	0.0000125
Maximum	0.0000498	0.0000539	0.0000562	0.0000590	0.0000694	0.0000440	0.0000255	0.0000200	0.0000233	0.0000244	0.0000263	0.0000282
Median	0.0000200	0.0000207	0.0000288	0.0000364	0.0000432	0.0000440	0.0000187	0.0000170	0.0000223	0.0000217	0.0000219	0.0000243
Stdev	0.0000166	0.0000158	0.0000140	0.0000122	0.0000133	0.0000000	0.0000055	0.0000042	0.0000009	0.0000072	0.0000032	0.0000055
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050
BC WQG max	0.000143	0.000149	0.000150	0.000159	0.000160	0.000169	0.000142	0.000147	0.000145	0.000151	0.000151	0.000175
BC WQG 30 day	0.000077	0.000079	0.000080	0.000083	0.000083	0.000087	0.000076	0.000078	0.000078	0.000080	0.000080	0.000088

Total Calcium (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.0	9.9	11.0	9.9	9.4	0.0	9.0	0.0	9.3	9.6	9.3	9.3
April	9.7	10.3	10.1	10.9	10.8	0.0	9.4	0.0	9.5	9.5	9.4	9.4
June	8.7	8.8	9.0	10.2	10.7	0.0	8.4	0.0	8.6	9.3	9.2	9.7
August	8.5	9.1	8.7	9.8	10.1	0.0	8.6	0.0	8.8	9.0	9.1	9.7
October	8.8	8.8	8.5	9.8	9.7	10.6	8.5	9.3	9.1	9.3	9.9	12.8
December	9.76	9.17	9.68	9.95	10.7	11.1	9.26	9.28	9.33	9.52	9.92	9.77

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Dissolved Calcium (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	9.7	9.5	9.8	9.7	10.1	0.0	10.3	0.0	9.1	9.2	9.0	8.9
April	10.1	10.1	10.4	10.7	10.8	0	9.7	0	9.47	9.32	9.65	9.53
June	7.8	7.7	8.3	9.3	11.1	0.0	8.7	0.0	8.8	9.5	8.5	8.8
August	9.2	9.7	8.9	10.4	10.9	0.0	8.9	0.0	9.6	10.0	9.7	9.6
October	9.6	9.5	9.2	10.7	10.3	11.4	9.4	9.5	9.8	9.8	9.9	9.6
December	9.2	9.27	9.45	9.72	10	10.7	9.01	9.02	9.07	9.5	9.39	9.4

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Total Copper (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.031500	0.001460	0.001470	0.001610	0.001790		0.000715		0.000962	0.001050	0.001180	0.002410
April	0.000982	0.000965	0.000953	0.001190	0.001230		0.000631		0.000711	0.000709	0.000858	0.000975
June	0.000607	0.000537	0.000658	0.000968	0.001060		0.000523		0.000697	0.000630	0.000812	0.001620
August	0.000580	0.000590	0.000644	0.000925	0.000973		0.000575		0.000619	0.000818	0.000848	0.003270
October	0.000554	0.000577	0.000933	0.000852	0.001330	0.001680	0.000831	0.000866	0.000606	0.000732	0.001330	0.084500
December	0.000630	0.001010	0.000900	0.002210	0.001190	0.001360	0.000960	0.000670	0.000550	0.000830	0.000830	0.000720

Mean	0.005809	0.000857	0.000926	0.001293	0.001262	0.001520	0.000706	0.000768	0.000691	0.000795	0.000976	0.015583
Minimum	0.000554	0.000537	0.000644	0.000852	0.000973	0.001360	0.000523	0.000670	0.000550	0.000630	0.000812	0.000720
Maximum	0.031500	0.001460	0.001470	0.002210	0.001790	0.001680	0.000960	0.000866	0.000962	0.001050	0.001330	0.084500
Median	0.000619	0.000778	0.000917	0.001079	0.001210	0.001520	0.000673	0.000768	0.000658	0.000775	0.000853	0.002015
Stdev	0.012587	0.000361	0.000300	0.000527	0.000288	0.000226	0.000165	0.000139	0.000146	0.000145	0.000222	0.033776
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
BC WQG max	0.00416	0.00443204	0.00443204	0.00443204	0.00443204	0.00443204	0.004432036	0.00443204	0.00443204	0.00443204	0.00443204	0.00443204
BC WQG 30 day	0.00092	0.00103491	0.00103491	0.00103491	0.00103491	0.00103491	0.001034909	0.00103491	0.00103491	0.00103491	0.00103491	0.00103491

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Total Manganese (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.03150	0.00345	0.00302	0.00352	0.00420	0.00000	0.00106		0.00143	0.00154	0.00166	0.00210
April	0.00352	0.00327	0.00354	0.00433	0.00463	0.00000	0.00172		0.00185	0.00142	0.00142	0.00161
June	0.00160	0.00197	0.00174	0.00365	0.00506	0.00000	0.00140		0.00150	0.00143	0.00152	0.00192
August	0.00122	0.00174	0.00183	0.00398	0.00608	0.00000	0.00128		0.00150	0.00179	0.00163	0.06320
October	0.00124	0.00132	0.00213	0.00539	0.00594	0.02290	0.00098	0.00093	0.00170	0.00175	0.00895	1.08000
December	0.00186	0.00177	0.00263	0.00335	0.00726	0.01410	0.00164	0.00139	0.00142	0.00154	0.00907	0.00210

Mean	0.00682	0.00225	0.00248	0.00404	0.00553	0.00617	0.00135	0.00116	0.00157	0.00158	0.00404	0.19182
Minimum	0.00122	0.00132	0.00174	0.00335	0.00420	0.00000	0.00098	0.00093	0.00142	0.00142	0.00142	0.00161
Maximum	0.03150	0.00345	0.00354	0.00539	0.00726	0.02290	0.00172	0.00139	0.00185	0.00179	0.00907	1.08000
Median	0.00173	0.00187	0.00238	0.00382	0.00550	0.00000	0.00134	0.00116	0.00150	0.00154	0.00165	0.00210
Stdev	0.01212	0.00088	0.00071	0.00075	0.00112	0.00995	0.00030	0.00032	0.00017	0.00016	0.00385	0.43581
n	6	6	6	6	6	6	6	2	6	6	6	6
DL Range		0.00005	0.00005	0.00005	0.00005	0.00005		0.00005	0.00005	0.00005	0.00005	0.00005
BC WQG max	See Table											
BC WQG 30 d	See Table											

Dissolved Manganese (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.00155	0.00165	0.00152	0.00190	0.00238		0.00046		0.00058	0.00059	0.00051	0.00088
April	0.00208	0.00131	0.00143	0.00217	0.00254		0.00111		0.00103	0.000964	0.000826	0.00103
June	0.00011	0.00083	0.00047	0.00118	0.00155		0.00036		0.00046	0.00045	0.00064	0.00068
August	0.00005	0.00005	0.00063	0.00210	0.00344		0.00005		0.00061	0.00071	0.00053	0.00209
October	0.000175	0.000237	0.000487	0.00288	0.00334	0.0124	0.000193	0.000051	0.000209	0.00032	0.000412	0.000637
December	0.00051	0.00055	0.00099	0.00110	0.00310	0.00912	0.00037	0.00034	0.00039	0.00039	0.00056	0.00058

Mean	0.00075	0.00077	0.00092	0.00189	0.00273	0.01076	0.00042	0.00020	0.00055	0.00057	0.00058	0.00098
Minimum	0.00005	0.00005	0.00047	0.00110	0.00155	0.00912	0.00005	0.00005	0.00021	0.00032	0.00041	0.00058
Maximum	0.00208	0.00165	0.00152	0.00288	0.00344	0.01240	0.00111	0.00034	0.00103	0.00096	0.00083	0.00209
Median	0.00034	0.00069	0.00081	0.00200	0.00282	0.01076	0.00037	0.00020	0.00052	0.00052	0.00055	0.00078
Stdev	0.00086	0.00062	0.00047	0.00067	0.00072	0.00232	0.00037	0.00020	0.00028	0.00024	0.00014	0.00057
n	6	6	6	6	6	2	6	2	6	6	6	6
DL Range	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
BC WQG		n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a

Total Zinc (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.03150	0.01930	0.01990	0.02080	0.02560		0.00812		0.00835	0.00907	0.00981	0.01300
April	0.01410	0.01350	0.01420	0.01860	0.02000		0.00773		0.00829	0.00833	0.00811	0.00859
June	0.00530	0.00529	0.00868	0.01450	0.01630		0.00581		0.00688	0.00826	0.00678	0.00877
August	0.00474	0.00633	0.00822	0.01390	0.01570		0.00430		0.00807	0.00795	0.00838	0.01710
October	0.00509	0.00536	0.00733	0.01330	0.01310	0.02210	0.00543	0.00518	0.00809	0.00841	0.01000	0.25000
December	0.01050	0.01180	0.01530	0.01340	0.01770	0.01910	0.01160	0.00940	0.01360	0.01290	0.01370	0.01270

[illegible]

Dissolved Zinc (mg/L)	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
February	0.01700	0.01700	0.01750	0.01910	0.02200		0.00887		0.00777	0.00792	0.00739	0.01110
April	0.01310	0.0127	0.0131	0.0173	0.0185		0.00744		0.00789	0.00751	0.00758	0.00819
June	0.00455	0.00454	0.00775	0.0126	0.01440		0.00537		0.00606	0.00774	0.00609	0.00803
August	0.00412	0.00560	0.00775	0.01290	0.01460		0.00393		0.00757	0.00725	0.00733	0.00261
October	0.00502	0.00531	0.00659	0.01300	0.01200	0.0189	0.00498	0.00421	0.00823	0.00775	0.00794	0.00527
December	0.01440	0.0081	0.01100	0.01000	0.01480	0.0157	0.00710	0.0069	0.00740	0.00930	0.00960	0.0108

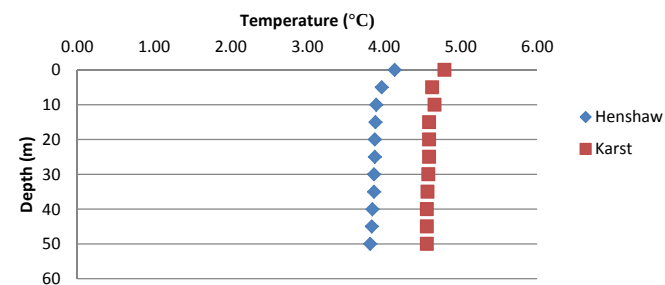
[illegible]

Hardness	BL-GOLD	HEN-0	HEN-10	HEN-20	HEN-40	HEN-60	HEN-100	KARS-0	KARS-10	KARS-20	KARS-40	KARS-60	KARS-100
January	24.7												
February	0.0	25.5	27.6	30.4	27.4	26.3		25.6		26.4	27.3	26.4	26.4
March	27.7												
April	27.4	27.2	28.9	28.4	30.4	30.3		26.8		26.9	27.0	26.8	26.8
May	24.7												
June	25.8	24.5	24.6	25.2	28.3	29.8		23.9		24.2	26.5	26.1	27.5
July	23.6												
August	23.4	24.3	25.8	24.6	27.1	27.9		24.4		25.1	25.6	25.9	28.0
September	23.7												
October	25.7	25.0	25	24.1	27.4	27.2	29.7	24.4	26	26	26.4	28	49.6
November	25.7												
December	25.5	26	26.1	26.5	27.4	28	29.9	25.5	25.6	25.7	27.2	26.9	26.9

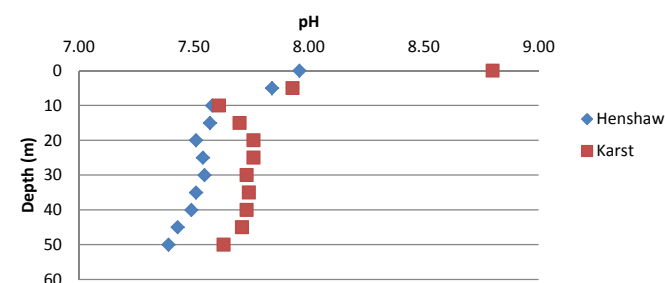
Mean	23.16	25.42	26.33	26.53	28.00	28.25	29.80	25.10	26.00	25.70	26.67	26.68	30.87
Minimum	0.03	24.30	24.60	24.10	27.10	26.30	29.70	23.90	25.60	24.20	25.60	25.90	26.40
Maximum	27.70	27.20	28.90	30.40	30.40	30.30	29.90	26.80	26.40	26.90	27.30	28.00	49.60
Median	25.10	25.25	25.95	25.85	27.40	27.95	29.80	24.95	26.00	25.80	26.75	26.60	27.20
Stdev	7.41	1.08	1.63	2.44	1.24	1.53	0.14	1.07	0.57	0.96	0.64	0.75	9.19
n	12.00	6.00	6.00	6.00	6.00	6.00	2.00	6.00	2.00	6.00	6.00	6.00	6.00
DL Range	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00

BUTTLE LAKE AT HENSHAW CREEK & KARST CREEK SITES								
DEPTH PROFILE			HYDROLAB / SONDE UNIT					
PERMIT PE-06858			SRN 0130082 - Henshaw					
			SRN 0130090 - Karst					
Samplers: CS, LKTE								
General Weather Conditions:			Karst: Calm, overcast					
			Henshaw: Calm, overcast					
Lake Conditions:			Calm					
STN	Depth	DATE	PH-L	mS/cm COND-F	C TEMP-F	mg/L DO-F		m SECCHI
BL-HEN-0	0	15/02/2018	7.96	0.060	4.14	13.90	Depth disk vanished	9.5
BL-HEN-5	5	15/02/2018	7.84	0.060	3.97	12.13	Depth disk reappeared	6
BL-HEN-10	10	15/02/2018	7.58	0.061	3.90	11.92	Secchi Depth	7.75
BL-HEN-15	15	15/02/2018	7.57	0.061	3.89	11.75		
BL-HEN-20	20	15/02/2018	7.51	0.061	3.88	11.69		
BL-HEN-25	25	15/02/2018	7.54	0.061	3.88	11.40		
BL-HEN-30	30	15/02/2018	7.55	0.061	3.87	11.31		
BL-HEN-35	35	15/02/2018	7.51	0.062	3.87	11.22		
BL-HEN-40	40	15/02/2018	7.49	0.061	3.85	11.16		
BL-HEN-45	45	15/02/2018	7.43	0.062	3.84	10.92		
BL-HEN-50	50	15/02/2018	7.39	0.062	3.82	10.52		
SECCHI DEPTH	7.75							
BL-KARS-0	0	15/02/2018	8.80	0.052	4.79	11.14	Depth disk vanished	14
BL-KARS-5	5	15/02/2018	7.93	0.055	4.63	11.16	Depth disk reappeared	12.5
BL-KARS-10	10	15/02/2018	7.61	0.057	4.66	13.93	Secchi Depth	13.25
BL-KARS-15	15	15/02/2018	7.70	0.057	4.59	11.84		
BL-KARS-20	20	15/02/2018	7.76	0.057	4.59	11.26		
BL-KARS-25	25	15/02/2018	7.76	0.057	4.59	11.05		
BL-KARS-30	30	15/02/2018	7.73	0.057	4.58	10.90		
BL-KARS-35	35	15/02/2018	7.74	0.057	4.57	10.72		
BL-KARS-40	40	15/02/2018	7.73	0.056	4.56	10.75		
BL-KARS-45	45	15/02/2018	7.71	0.055	4.56	10.69		
BL-KARS-50	50	15/02/2018	7.63	0.056	4.56	10.55		
SECCHI DEPTH	13.25							

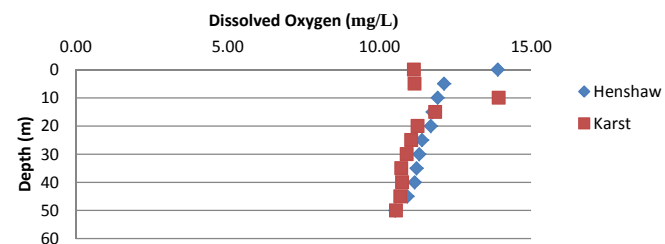
Temperature vs Depth February 2018



pH vs Depth February 2018



Dissolved Oxygen vs Depth February 2018



[illegible]

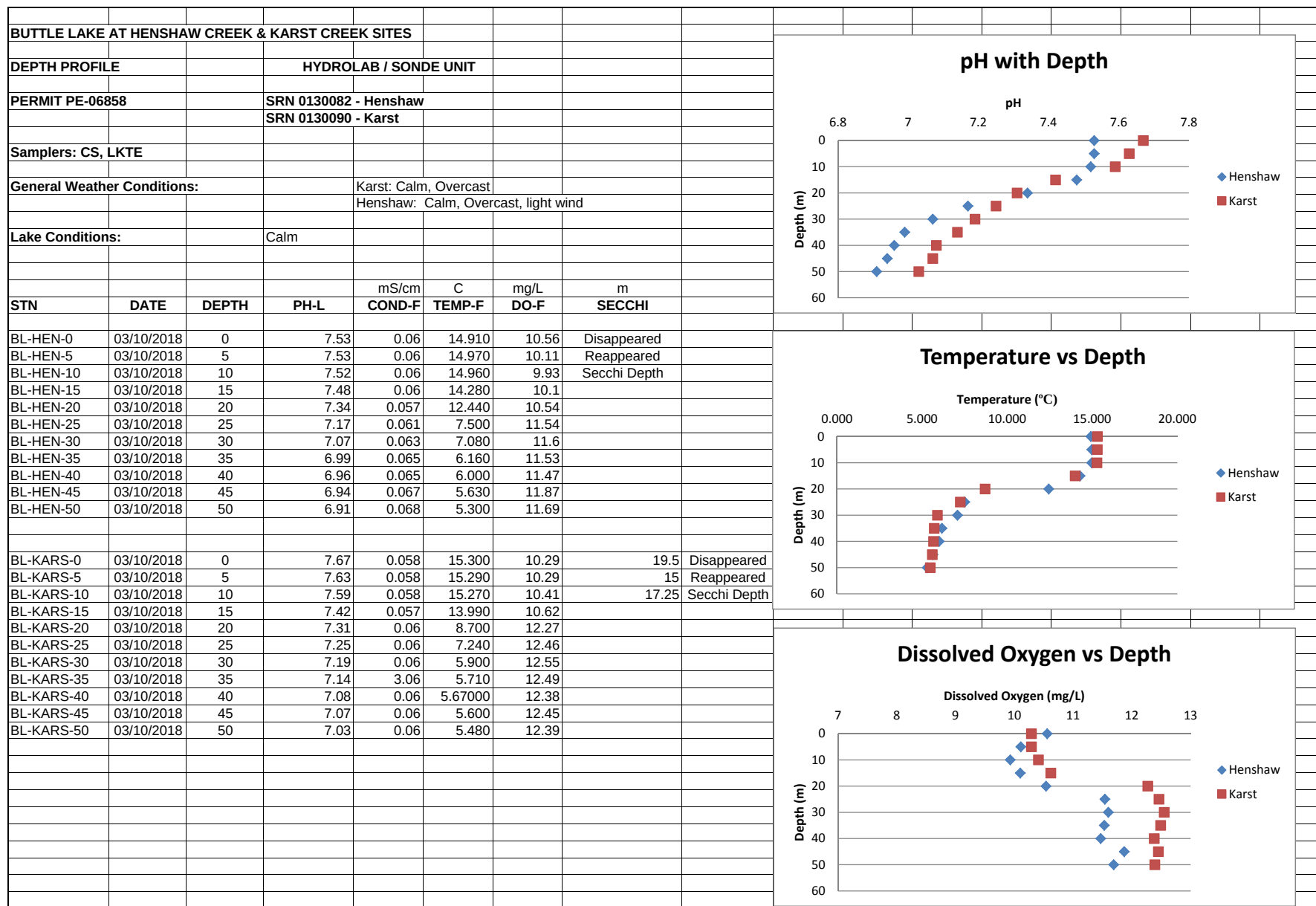
The figure consists of three vertically stacked scatter plots, each showing a different water quality parameter versus depth (0 to 60 meters) for two locations: Henshaw (blue diamonds) and Karst (red squares). The y-axis for all plots is Depth (m), ranging from 0 at the top to 60 at the bottom.

- pH vs Depth:** The x-axis ranges from 6.8 to 8.0. Henshaw data points are clustered between 10m and 50m depth, with pH values ranging from approximately 7.1 to 7.4. Karst data points are more widely distributed, ranging from about 5m to 40m depth, with pH values from 7.1 to 7.5.
- Temperature vs Depth:** The x-axis ranges from 0.00 to 20.00 °C. Both sites show a clear temperature gradient with depth. Henshaw data points are at 10m, 20m, and 40m depth, with temperatures between 14.5°C and 16.5°C. Karst data points range from 5m to 55m depth, with temperatures from 15.5°C down to 4.5°C.
- Dissolved Oxygen vs Depth:** The x-axis ranges from 7 to 10.5 mg/L. Henshaw data points are at 0m, 10m, 20m, 30m, 40m, and 50m depth, with DO values between 8.0 and 10.2 mg/L. Karst data points range from 5m to 50m depth, with DO values from 8.0 to 10.0 mg/L.

pH with Depth

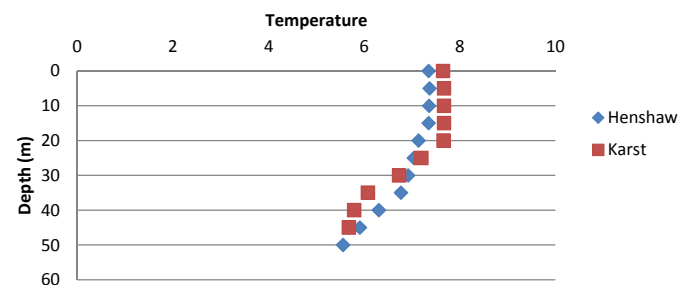
Scatter plot showing pH (X-axis, 0.00 to 10.00) versus Depth (m) (Y-axis, 0 to 60). Data points are categorized by site: Henshaw (blue diamonds) and Karst (red squares).

Depth (m)	Site	pH
0	Karst	7.5
0	Karst	7.6
0	Karst	7.7
0	Karst	7.8
0	Karst	7.9
0	Karst	8.0
0	Karst	8.1
0	Karst	8.2
0	Karst	8.3
0	Karst	8.4
0	Karst	8.5
0	Karst	8.6
0	Karst	8.7
0	Karst	8.8
0	Karst	8.9
0	Karst	9.0
0	Karst	9.1
0	Karst	9.2
0	Karst	9.3
0	Karst	9.4
0	Karst	9.5
0	Karst	9.6
0	Karst	9.7
0	Karst	9.8
0	Karst	9.9
0	Karst	10.0
0	Karst	10.1
0	Karst	10.2
0	Karst	10.3
0	Karst	10.4
0	Karst	10.5
0	Karst	10.6
0	Karst	10.7
0	Karst	10.8
0	Karst	10.9
0	Karst	11.0
0	Karst	11.1
0	Karst	11.2
0	Karst	11.3
0	Karst	11.4
0	Karst	11.5
0	Karst	11.6
0	Karst	11.7
0	Karst	11.8
0	Karst	11.9
0	Karst	12.0
0	Karst	12.1
0	Karst	12.2
0	Karst	12.3
0	Karst	12.4
0	Karst	12.5
0	Karst	12.6
0	Karst	12.7
0	Karst	12.8
0	Karst	12.9
0	Karst	13.0
0	Karst	13.1
0	Karst	13.2
0	Karst	13.3
0	Karst	13.4
0	Karst	13.5
0	Karst	13.6
0	Karst	13.7
0	Karst	13.8
0	Karst	13.9
0	Karst	14.0
0	Karst	14.1
0	Karst	14.2
0	Karst	14.3
0	Karst	14.4
0	Karst	14.5
0	Karst	14.6
0	Karst	14.7
0	Karst	14.8
0	Karst	14.9
0	Karst	15.0
0	Karst	15.1
0	Karst	15.2
0	Karst	15.3
0	Karst	15.4
0	Karst	15.5
0	Karst	15.6
0	Karst	15.7
0	Karst	15.8
0	Karst	15.9
0	Karst	16.0
0	Karst	16.1
0	Karst	16.2
0	Karst	16.3
0	Karst	16.4
0	Karst	16.5
0	Karst	16.6
0	Karst	16.7
0	Karst	16.8
0	Karst	16.9
0	Karst	17.0
0	Karst	17.1
0	Karst	17.2
0	Karst	17.3
0	Karst	17.4
0	Karst	17.5
0	Karst	17.6
0	Karst	17.7
0	Karst	17.8
0	Karst	17.9
0	Karst	18.0
0	Karst	18.1
0	Karst	18.2
0	Karst	18.3
0	Karst	18.4
0	Karst	18.5
0	Karst	18.6
0	Karst	18.7
0	Karst	18.8
0	Karst	18.9
0	Karst	19.0
0	Karst	19.1
0	Karst	19.2
0	Karst	19.3
0	Karst	19.4
0	Karst	19.5
0	Karst	19.6
0	Karst	19.7
0	Karst	19.8
0	Karst	19.9
0	Karst	20.0
0	Karst	20.1
0	Karst	20.2
0	Karst	20.3
0	Karst	20.4
0	Karst	20.5
0	Karst	20.6
0	Karst	20.7
0	Karst	20.8
0	Karst	20.9
0	Karst	21.0
0	Karst	21.1
0	Karst	21.2
0	Karst	21.3
0	Karst	21.4
0	Karst	21.5
0	Karst	21.6
0	Karst	21.7
0	Karst	21.8
0	Karst	21.9
0	Karst	22.0
0	Karst	22.1
0	Karst	22.2
0	Karst	22.3
0	Karst	22.4
0	Karst	22.5
0	Karst	22.6
0	Karst	22.7
0	Karst	22.8
0	Karst	22.9
0	Karst	23.0
0	Karst	23.1
0	Karst	23.2
0	Karst	23.3
0	Karst	23.4
0	Karst	23.5
0	Karst	23.6
0	Karst	23.7
0	Karst	23.8
0	Karst	23.9
0	Karst	24.0
0	Karst	24.1
0	Karst	24.2
0	Karst	24.3
0	Karst	24.4
0	Karst	24.5
0	Karst	24.6
0	Karst	24.7
0	Karst	24.8
0	Karst	24.9
0	Karst	25.0
0	Karst	25.1
0	Karst	25.2
0	Karst	25.3
0	Karst	25.4
0	Karst	25.5
0	Karst	25.6
0	Karst	25.7
0	Karst	25.8
0	Karst	25.9
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0	Karst	26.1
0	Karst	26.2
0	Karst	26.3
0	Karst	26.4
0	Karst	26.5
0	Karst	26.6
0	Karst	26.7
0	Karst	26.8
0	Karst	26.9
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0	Karst	27.2
0	Karst	27.3
0	Karst	27.4
0	Karst	27.5
0	Karst	27.6
0	Karst	27.7
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0	Karst	27.9
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0	Karst	28.6
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0	Karst	28.8
0	Karst	28.9
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0	Karst	29.4
0	Karst	29.5
0	Karst	29.6
0	Karst	29.7
0	Karst	29.8
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0	Karst	30.6
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0	Karst	30.9
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0	Karst	34.9
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0	Karst	35.6
0	Karst	35.7
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0	Karst	35.9
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0	Karst	36.4
0	Karst	36.5
0	Karst	36.6
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0	Karst	37.6
0	Karst	37.7
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0	Karst	38.6
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0	Karst	39.9
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0	Karst	40.7
0	Karst	40.8
0	Karst	40.9
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0	Karst	41.1
0	Karst	41.2
0	Karst	41.3
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0	Karst	41.5
0	Karst	41.6
0	Karst	41.7
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0	Karst	41.9
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0	Karst	42.4
0	Karst	42.5
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0	Karst	42.9
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0	Karst	43.6
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0	Karst	43.9
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0	Karst	44.4
0	Karst	44.5
0	Karst	44.6
0	Karst	44.7
0	Karst	44.8
0	Karst	44.9
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0	Karst	45.2
0	Karst	45.3
0	Karst	45.4
0	Karst	45.5
0	Karst	45.6
0	Karst	45.7
0	Karst	45.8
0	Karst	45.9
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0	Karst	46.1
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0	Karst	46.4
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0	Karst	46.6
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0	Karst	46.8
0	Karst	46.9
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0	Karst	47.8
0	Karst	47.9
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0	Karst	48.3
0	Karst	48.4
0	Karst	48.5
0	Karst	48.6
0	Karst	48.7
0	Karst	48.8
0	Karst	48.9
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0	Karst	49.2
0	Karst	49.3
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0	Karst	49.5
0	Karst	49.6
0	Karst	49.7
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0	Karst	50.2
0	Karst	50.3
0	Karst	50.4
0	Karst	50.5
0	Karst	50.6
0	Karst	50.7
0	Karst	50.8
0	Karst	50.9
0	Karst	51.0
0	Karst	51.1
0	Karst	51.2
0	Karst	51.3
0	Karst	51.4
0	Karst	51.5
0	Karst	51.6
0	Karst	51.7
0	Karst	51.8
0	Karst	51.9
0	Karst	52.0
0	Karst	52.1
0	Karst	52.2
0	Karst	52.3
0	Karst	52.4
0	Karst	52.5
0	Karst	52.6
0	Karst	52.7
0	Karst	52.8
0	Karst	52.9
0	Karst	53.0
0	Karst	53.1
0	Karst	53.2
0	Karst	53.3
0	Karst	53.4
0	Karst	53.5
0	Karst	53.6
0	Karst	53.7
0	Karst	53.8
0	Karst	53.9
0	Karst	54.0
0	Karst	54.1
0	Karst	54.2

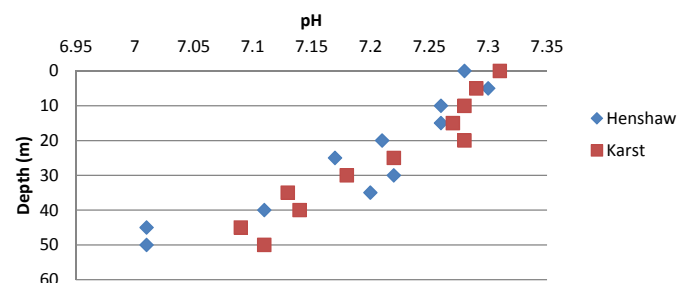


BUTTLE LAKE AT HENSHAW CREEK & KARST CREEK SITES							
DEPTH PROFILE			HYDROLAB / SONDE UNIT				
PERMIT PE-06858			SRN 0130082 - Henshaw				
			SRN 0130090 - Karst				
Samplers: CS, LKTE							
General Weather Conditions:			Karst: Calm, Clear, Light fog				
			Henshaw: Calm, Clear, Light fog				
Lake Conditions:			Calm				
STN	DATE	Depth	C TEMP-F	mS/cm COND-F	mg/L DO-F	PH-L	m SECCHI
BL-HEN-0	05/12/2018	0	7.35	0.06	12.060	7.28	7.8
BL-HEN-5	05/12/2018	5	7.37	0.06	12.110	7.3	
BL-HEN-10	05/12/2018	10	7.36	0.06	11.940	7.26	
BL-HEN-15	05/12/2018	15	7.35	0.059	11.800	7.26	
BL-HEN-20	05/12/2018	20	7.14	0.6	11.620	7.21	
BL-HEN-25	05/12/2018	25	7.04	0.061	11.590	7.17	
BL-HEN-30	05/12/2018	30	6.92	0.06	11.450	7.22	
BL-HEN-35	05/12/2018	35	6.77	0.06	11.420	7.2	
BL-HEN-40	05/12/2018	40	6.31	0.063	10.830	7.11	
BL-HEN-45	05/12/2018	45	5.91	0.065	10.750	7.01	
BL-HEN-50	05/12/2018	50	5.56	0.067	10.530	7.01	
BL-KARS-0	05/12/2018	0	7.650	0.057	11.48	7.31	10.5
BL-KARS-5	05/12/2018	5	7.670	0.058	11.8	7.29	
BL-KARS-10	05/12/2018	10	7.670	0.058	11.35	7.28	
BL-KARS-15	05/12/2018	15	7.670	0.058	11.29	7.27	
BL-KARS-20	05/12/2018	20	7.660	0.058	11.05	7.28	
BL-KARS-25	05/12/2018	25	7.200	0.055	11.1	7.22	
BL-KARS-30	05/12/2018	30	6.730	0.056	11.19	7.18	
BL-KARS-35	05/12/2018	35	6.080	0.059	11.15	7.13	
BL-KARS-40	05/12/2018	40	5.790	0.059	11.05	7.14	
BL-KARS-45	05/12/2018	45	5.680	0.058	11.07	7.09	
BL-KARS-50	05/12/2018	50	5.620	0.059	10.95	7.11	

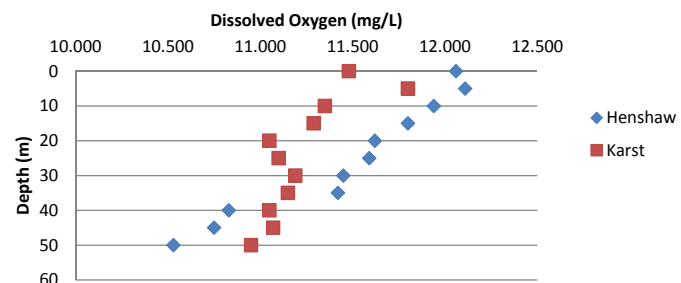
Temperature with Depth



pH vs Depth



Dissolved Oxygen vs Depth



BUTTLE LAKE PHYTOPLANKTON - February 23, 2017

Henshaw

27 ml sample settled

TOTAL CELLS COUNTED	218
TOTAL CELLS PER ML	430

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	26	234
Ochromonas/Chromulina spp. (4-5 um)	12	108
Ochromonas/Chromulina spp. (6-7 um)	3	27
TOTAL	41	369

400X magnification - 4 strips		
CHRYSTOPHYCEAE		
Ochromonas spp. (8-10 um)	92	39
BACILLARIOPHYCEAE		
Cyclotella glomerata (cells + cols)	1	0.4
Cymbella sp. (small)	1	0.4
Melosira italica (filaments)	1	0.4
Rhizosolenia longiseta	17	7
CHLOROPHYCEAE		
Cosmarium sp. (small)	1	0.4
CRYPTOPHYCEAE		
Cryptomonas spp.	8	3
Rhodomonas minuta	27	11
TOTAL	148	63

100X magnification - whole sample		
BACILLARIOPHYCEAE		
Asterionella formosa (1 col, 16 cells)	16	0.6
Synedra radians	11	0.4
Tabellaria fenestrata (1 col, 2 cells)	2	0.1
TOTAL	29	1.2

BUTTLE LAKE PHYTOPLANKTON - April 18, 2018**Henshaw**

27 ml sample settled

TOTAL CELLS COUNTED	450
TOTAL CELLS PER ML	650

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	24	216
Ochromonas/Chromulina spp. (4-5 um)	24	216
Ochromonas/Chromulina spp. (6-7 um)	2	18
TOTAL	50	450

400X magnification - 2 strips

CHRYSTOPHYCEAE		
Chrysolikos sp.	2	2
Chrysococcus sp.	1	1
Dinobryon sp. (cyst)	1	1
Ochromonas spp. (8-10 um)	64	54
BACILLARIOPHYCEAE		
Melosira italica (filaments)	5	4
Rhizosolenia longiseta	126	107
CHLOROPHYCEAE		
Cosmarium sp.	1	1
Gloeocystis sp. (cells)	1	1
Oocystis sp. (cells + cols)	1	1
Scenedesmus sp. (cols)	1	1
DINOPHYCEAE		
Gymnodinium sp.	1	1
CRYPTOPHYCEAE		
Cryptomonas spp.		
Rhodomonas minuta	13	11
TOTAL	225	191

100X magnification - half sample

BACILLARIOPHYCEAE		
Asterionella formosa (6 cols, 21 cells)	21	1.7
Synedra radians	150	12.0
Synedra ulna	3	0.2
CHLOROPHYCEAE		
Elakatothrix gelatinosa (cols)	1	0.1
TOTAL	175	14.0

BUTTLE LAKE PHYTOPLANKTON - June 27, 2018**Henshaw**

27 ml sample settled

BUTTLE LAKE PHYTOPLANKTON	156
TOTAL CELLS PER ML	250

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	10	90
Ochromonas/Chromulina spp. (4-5 um)	12	108
Ochromonas/Chromulina spp. (6-7 um)	1	9
TOTAL	23	207

400X magnification - 4 strips

CHRYSTOPHYCEAE		
Dinobryon sp. (cells)	13	6
Mallomonas sp.	3	1
Ochromonas spp. (8-10 um)	40	17
BACILLARIOPHYCEAE		
Melosira italica (filaments)	10	4
Rhizosolenia longiseta	2	1
Synedra sp. (small)	2	1
CHLOROPHYCEAE		
Crucigenia sp. (cols)	1	0.4
Cosmarium sp. (small)	7	3
Dictyosphaerium cf. pulchellum (cols)	2	1
Gloeocystis sp. (cols + cells)	2	1
Oocystis sp. (cells + cols)	6	3
Scenedesmus sp. (cols)	4	2
DINOPHYCEAE		
Peridinium sp.	1	0.4
CRYPTOPHYCEAE		
Cryptomonas spp.	3	1
Rhodomonas minuta	12	5
CYANOPHYCEAE		
Dactylococcopsis acicularis (cols)	2	1
TOTAL	110	47

100X magnification - whole sample

CYANOPHYCEAE		
Dinobryon cylindricum (1 col, 2 cells)	2	0.1
BACILLARIOPHYCEAE		
Asterionella formosa (8 col, 19 cells) - poor sh	19	0.8
Synedra radians	1	0.04
CHLOROPHYCEAE		
Cosmarium sp. (large)	1	0.04
TOTAL	23	0.9

BUTTLE LAKE PHYTOPLANKTON - August 15, 2018**Henshaw****27 ml sample settled****BUTTLE LAKE PHYTOPLANKTON 315**
TOTAL CELLS PER ML 600

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	34	306
Ochromonas/Chromulina spp. (4-5 um)	16	144
Ochromonas/Chromulina spp. (6-7 um)	5	45
TOTAL	55	495

400X magnification - 4 strips

CHRYSTOPHYCEAE		
Chrysocapsa paludosa (cols + cells)	2	1
Dinobryon sp. (cells)	42	18
Diceras chodatii	1	0.4
Ochromonas spp. (8-10 um)	106	45
BACILLARIOPHYCEAE		
Melosira italica (filaments)	15	6
Rhizosolenia longiseta	8	3
CHLOROPHYCEAE		
Cosmarium sp. (small)	2	1
Dictyosphaerium cf. pulchellum (cols)	1	0.4
Gloeocystis sp. (cols + cells)	13	6
Oocystis sp. (cells + cols)	5	2
Schroderia setigera	1	0.4
Scenedesmus sp. (cols)	2	1
DINOPHYCEAE		
Peridinium sp.	5	2
CRYPTOPHYCEAE		
Cryptomonas spp.	32	14
Rhodomonas minuta	5	2
CYANOPHYCEAE		
Chroococcus sp. (cols)	1	0.4
Dactylococcopsis acicularis (cols)	7	3
Merismopedia sp. (cols)	3	1
TOTAL	251	107

100X magnification - whole sample

BACILLARIOPHYCEAE		
Synedra radians	5	0.20
CHLOROPHYCEAE		
Elakatothrix gelatinosa (cols)	2	0.08
CYANOPHYCEAE		
Aphanocapsa sp. (cols)	2	0.08
TOTAL	9	0.36

BUTTLE LAKE PHYTOPLANKTON - October 3, 2018**Henshaw**

27 ml sample settled

BUTTLE LAKE PHYTOPLANKTON	252
TOTAL CELLS PER ML	940

1000X magnification - 50 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	23	414
Ochromonas/Chromulina spp. (4-5 um)	13	234
Ochromonas/Chromulina spp. (6-7 um)	4	72
Chrysochromulina parva	3	54
TOTAL	43	774

400X magnification - 2 strips

CHRYSTOPHYCEAE		
Dinobryon sp. (cells)	5	4
Ochromonas spp. (8-10 um)	98	83
BACILLARIOPHYCEAE		
Cyclotella glomerata (cells + cols)	10	9
Melosira italica (filaments)	15	13
Rhizosolenia longiseta	4	3
CHLOROPHYCEAE		
Cosmarium sp. (small)	1	1
Peridinium sp.	3	3
CRYPTOPHYCEAE		
Cryptomonas spp.	24	20
Rhodomonas minuta	21	18
CYANOPHYCEAE		
Aphanothece sp. (cols)	4	3
Aphanocapsa sp. (cols)	2	2
Dactylococcopsis acicularis (cols)	2	2
TOTAL	189	161

100X magnification - whole sample

CHRYSTOPHYCEAE		
Dinobryon cylindricum (1 col, 16 cells)	16	0.64
BACILLARIOPHYCEAE		
Synedra radians	1	0.04
CHLOROPHYCEAE		
Botryococcus braunii (cols)	2	0.08
CYANOPHYCEAE		
Chroococcus sp. (cols)	1	0.04
TOTAL	20	0.80

BUTTLE LAKE PHYTOPLANKTON - December 5, 2018**Henshaw****27 ml sample settled****BUTTLE LAKE PHYTOPLANKTON 290**
TOTAL CELLS PER ML 580

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	30	270
Ochromonas/Chromulina spp. (4-5 um)	20	180
Ochromonas/Chromulina spp. (6-7 um)	2	18
Chrysochromulina parva	1	9
Pseudoekephyrion sp.	1	9
TOTAL	54	486

400X magnification - 4 strips		
CHRYSTOPHYCEAE		
Diceras chodati	3	1
Dinobryon sp. (cells)	6	3
Ochromonas spp. (8-10 um)	98	42
BACILLARIOPHYCEAE		
Cyclotella glomerata (cells + cols)	15	6
Melosira italica (filaments)	19	8
Rhizosolenia longiseta	21	9
CHLOROPHYCEAE		
Gloeocystis sp. (cells + cols)	2	1
Scenedesmus sp. (cols)	2	1
DINOPHYCEAE		
Peridinium sp.	1	0.4
CRYPTOPHYCEAE		
Cryptomonas spp.	16	7
Rhodomonas minuta	25	11
CYANOPHYCEAE		
Dactylococcopsis acicularis (cols)	4	2
TOTAL	212	90

100X magnification - whole sample		
CHRYSTOPHYCEAE		
Dinobryon cylindricum (2 col, 12 cells)	12	0.48
BACILLARIOPHYCEAE		
Synedra radians	8	0.32
CHLOROPHYCEAE		
Elakatothrix gelatinosa (cols)	4	0.16
TOTAL	24	0.96

BUTTLE LAKE PHYTOPLANKTON - February 23, 2017

Karst

27 ml sample settled

TOTAL CELLS COUNTED	370
TOTAL CELLS PER ML	460

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	24	216
Ochromonas/Chromulina spp. (4-5 um)	14	126
Ochromonas/Chromulina spp. (6-7 um)	1	9
Chrysochromulina parva	1	9
TOTAL	40	360

400X magnification - 4 strips

CHRYSTOPHYCEAE		
Chrysolikos sp.	1	0.4
Mallomonas sp.	1	0.4
Ochromonas spp. (8-10 um)	95	40
BACILLARIOPHYCEAE		
Cyclotella sp. (20 um dia)	1	0.4
Cyclotella glomerata (cells + cols)	2	1
Melosira italica (filaments)	5	2
Rhizosolenia longiseta	62	26
CHLOROPHYCEAE		
Gloeocystis sp. (cells)	2	1
Oocystis sp. (cells + cols)	1	0.4
Scenedesmus sp. (cols)	1	0.4
DINOPHYCEAE		
Gymnodinium sp.	1	0.4
Peridinium sp.	2	1
CRYPTOPHYCEAE		
Cryptomonas spp.	15	6
Rhodomonas minuta	42	18
TOTAL	231	98

100X magnification - whole sample

BACILLARIOPHYCEAE		
Asterionella formosa (3 col, 11 cells)	11	0.4
Synedra radians	84	3.36
Synedra ulna	4	0.16
TOTAL	99	4.0

BUTTLE LAKE PHYTOPLANKTON - April 18, 2018

Karst

27 ml sample settled

TOTAL CELLS COUNTED	388
TOTAL CELLS PER ML	690

1000X magnification - 100 fields	number counted	cells per ml
CHRYSTOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	32	288
Ochromonas/Chromulina spp. (4-5 um)	24	216
Ochromonas/Chromulina spp. (6-7 um)	2	18
TOTAL	58	522

400X magnification - 2 strips

CHRYSTOPHYCEAE		
Ochromonas spp. (8-10 um)	33	28
BACILLARIOPHYCEAE		0
Cyclotella glomerata (cells + cols)	3	
Cyclotella sp.	1	1
Melosira italica (filaments)	4	3
Rhizosolenia longiseta	136	116
CHLOROPHYCEAE		
Gloeocystis sp. (cols + cells)	5	4
Oocystis sp. (cells + cols)	2	2
DINOPHYCEAE		
Peridinium sp.	2	2
CRYPTOPHYCEAE		
Cryptomonas spp.	3	3
Rhodomonas minuta	1	1
TOTAL	190	159

100X magnification - half sample

CYANOPHYCEAE		
Dinobryon sociale (1 col, 8 cells)	8	0.6
BACILLARIOPHYCEAE		
Asterionella formosa (2 col, 14 cells)	14	1.1
Synedra radians	109	8.7
Synedra ulna	3	0.2
CHLOROPHYCEAE		
Elakatothrix gelatinosa (cols)	3	0.2
UNIDENTIFIED FLAGELLATE	3	0.2
TOTAL	140	11.2

BUTTLE LAKE PHYTOPLANKTON - June 27, 2018

Karst

27 ml sample settled

TOTAL CELLS COUNTED	183
TOTAL CELLS PER ML	240

1000X magnification - 100 fields	number counted	cells per ml
CHRYSOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	12	108
Ochromonas/Chromulina spp. (4-5 um)	8	72
Ochromonas/Chromulina spp. (6-7 um)	1	9
TOTAL	21	189

400X magnification - 4 strips

CHRYSOPHYCEAE		
Dinobryon sp. (cells)	10	4
Mallomonas sp.	3	1
Ochromonas spp. (8-10 um)	44	19
BACILLARIOPHYCEAE		
Achnanthes spp.	2	1
Melosira italica (filaments)	14	6
Rhizosolenia longiseta	4	2
CHLOROPHYCEAE		
Cosmarium sp.	4	2
Gloeocystis sp. (cells)	2	1
Oocystis sp. (cells + cols)	3	1
Scenedesmus sp. (cols)	5	2
DINOPHYCEAE		
Peridinium sp.	3	1
CRYPTOPHYCEAE		
Cryptomonas spp.	10	4
Rhodomonas minuta	12	5
TOTAL	116	49

100X magnification - whole sample

BACILLARIOPHYCEAE		
Asterionella formosa (18 cols, 44 cells)	44	1.8
CHLOROPHYCEAE		
Cosmarium sp. (large)	2	0.1
TOTAL	46	1.8

BUTTLE LAKE PHYTOPLANKTON - August 15, 2018

Karst

27 ml sample settled

TOTAL CELLS COUNTED	330
TOTAL CELLS PER ML	900

1000X magnification - 100 fields	number counted	cells per ml
CHRY SOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	32	288
Ochromonas/Chromulina spp. (4-5 um)	32	288
Ochromonas/Chromulina spp. (6-7 um)	6	54
Chrysochromulina parva	14	126
Pseudokephyrion sp.	1	9
TOTAL	85	765

400X magnification - 3 strips		
CHRY SOPHYCEAE		
Dinobryon sp. (cells)	22	12
Mallomonas sp.	2	1
Ochromonas spp. (8-10 um)	102	58
BACILLARIOPHYCEAE		
Melosira italica (filaments)	15	9
Rhizosolenia longiseta	2	1
CHLOROPHYCEAE		
Cosmarium sp.	5	3
Dictyosphaerium cf. pulchellum (cols)	3	2
Gloeocystis sp. (cells)	19	11
Scenedesmus sp. (cols)	1	1
DINOPHYCEAE		
Gymnodinium sp.	1	1
Peridinium sp.	5	3
CRYPTOPHYCEAE		
Cryptomonas spp.	33	19
Rhodomonas minuta	9	5
CYANOPHYCEAE		
Dactylococcopsis acicularis (cols)	16	9
TOTAL	235	133

100X magnification - whole sample		
BACILLARIOPHYCEAE		
Asterionella formosa (1 cols, 5 cells)	5	0.2
Synedra radians	2	0.1
CHLOROPHYCEAE		
Botryococcus braunii (cols)	2	0.1
Elakatothrix gelatinosa (cols)	1	0.04

TOTAL

10

0.4

BUTTLE LAKE PHYTOPLANKTON - October 3, 2018

Karst

27 ml sample settled

TOTAL CELLS COUNTED	287
TOTAL CELLS PER ML	900

1000X magnification - 50 fields	number counted	cells per ml
CHRYSOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	20	360
Ochromonas/Chromulina spp. (4-5 um)	15	270
Ochromonas/Chromulina spp. (6-7 um)	3	54
Chrysochromulina parva	3	54
Pseudokephyrion sp.	2	36
TOTAL	43	774

400X magnification - 3 strips

CHRYSOPHYCEAE		
Dinobryon sp. (cells)	2	1
Mallomonas sp.	11	6
Ochromonas spp. (8-10 um)	105	60
BACILLARIOPHYCEAE		
Cyclotella glomerata (cols + cells)	16	9
Melosira italica (filaments)	16	9
Rhizosolenia longiseta	7	4
CHLOROPHYCEAE		
Gloeocystis sp. (cells)	4	2
Oocystis sp. (cells + cols)	5	3
DINOPHYCEAE		
Peridinium sp.	7	4
CRYPTOPHYCEAE		
Cryptomonas spp.	21	12
Rhodomonas minuta	29	16
CYANOPHYCEAE		
Aphanothece sp. (cols)	2	1
Aphanocapsa sp. (cols)	1	1
Dactylococcopsis acicularis (cols)	3	2
TOTAL	229	130

100X magnification - whole sample

CHRYSOPHYCEAE		
Dinobryon cylindricum (2 col, 14 cells)	14	0.6
BACILLARIOPHYCEAE		
Synedra radians	1	0.04
TOTAL	15	0.60

BUTTLE LAKE PHYTOPLANKTON - December 5, 2018

Karst

27 ml sample settled

TOTAL CELLS COUNTED	249
TOTAL CELLS PER ML	540

1000X magnification - 100 fields	number counted	cells per ml
CHRYSOPHYCEAE		
Ochromonas/Chromulina spp. (2-3 um)	28	252
Ochromonas/Chromulina spp. (4-5 um)	22	198
Ochromonas/Chromulina spp. (6-7 um)	2	18
TOTAL	52	468

400X magnification - 4 strips

CHRYSOPHYCEAE		
Chrysocapsa paludosa (cells+ cols)	2	1
Diceras chodati	4	2
Dinobryon sp. (cells)	5	2
Ochromonas spp. (8-10 um)	65	28
BACILLARIOPHYCEAE		
Cyclotella glomerata (cols + cells)	15	6
Melosira italica (filaments)	16	7
Rhizosolenia longiseta	11	5
CHLOROPHYCEAE		
Cosmarium sp.	1	0.4
Gloeocystis sp. (cells)	5	2
DINOPHYCEAE		
Peridinium sp.	2	1
CRYPTOPHYCEAE		
Cryptomonas spp.	13	6
Rhodomonas minuta	29	12
CYANOPHYCEAE		
Dactylococcopsis acicularis (cols)	1	0.4
TOTAL	169	72

100X magnification - whole sample

CHRYSOPHYCEAE		
Dinobryon cylindricum (5 col, 18 cells)	18	0.7
Dinobryon bavaricum (1 col, 2 cells)	2	0.1
BACILLARIOPHYCEAE		
Synedra radians	3	0.1
Tabellaria fenestrata (1 col, 4 cells)	4	0.2
CHLOROPHYCEAE		
Elakatothrix gelatinosa (cols)	1	0.04
TOTAL	28	1.1

Prepared by FRASER ENVIRONMENTAL SERVICES
 Prepared for NYRSTAR MYRA FALLS
 PO Box 8000, Campbell River, B.C., V9W 5E2
 Contact : Nicole Pesonen / Katie Babin / Craig Schweitzer / Ruth Kish
 tel. (250) 287-9271, ext. 3316 / fax (250) 287-7123

Nicole.Pesonen@nyrstar.com

katie.babin@nyrstar.com

craig.schweitzer@nyrstar.com

Ruth.Kish@nyrstar.com

FES Sample Number		180096	180097
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		February 15, 2018	
Time		10:45:00 AM	11:45:00 AM
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<u>Diacyclops thomasi</u>	adult	90	5
Order : Calanoida			
<u>Skistodiaptomus oregonensis</u>	adult	8	12
UID	copepod		1
UID Calanoida / Cyclopoida	nauplii	28	42
Sub-class : Branchiopoda			
<u>Bosmina longirostris</u>	adult	18	10
<u>Daphnia rosea</u>	adult	54	11
<u>Holopedium gibberum</u>	adult	4	
Phylum : Rotifera			
<u>Kellicottia longispina</u>		4	14
<u>Keratella cochlearis</u>		3	
<u>Keratella quadrata</u>		9	5
Benthic			
Order : Diptera			
Family : Chironomidae	larvae	1	
TOTAL		219	100

UID = unidentified due to lack of size and/or missing morphological characters.

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 Prepared for NYRSTAR MYRA FALLS
 PO Box 8000, Campbell River, B.C., V9W 5E2
 Contact : Nicole Pesonen / Katie Babin / Craig Schweitzer / Ruth Kish
 tel. (250) 287-9271, ext. 3316 / fax (250) 287-7123

Nicole.Pesonen@nyrstar.com
katie.babin@nyrstar.com
craig.schweitzer@nyrstar.com
Ruth.Kish@nyrstar.com

Inv. # 1080

FES Sample Number		180149	180150
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		April 18, 2018	
Time		10:50:00 AM	11:10:00 AM
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<u>Diacyclops thomasi</u>	adult	158	62
UID	copepodid	102	96
<u>Order : Calanoida</u>			
Skistodiaptomus oregonensis	adult	18	4
UID Calanoida / Cyclopoida	nauplii	301	358
Sub-class : Branchiopoda			
<u>Bosmina longirostris</u>	adult	105	42
<u>Daphnia rosea</u>	adult	52	8
<u>Holopedium gibberum</u>	adult	67	46
Phylum : Rotifera			
<u>Kellicottia longispina</u>			2
<u>Keratella cochlearis</u>		7	2
<u>Keratella quadrata</u>			18
<u>UID</u>			4
Benthic			
Order: Diptera			
<u>Family : Chironomidae</u>	larvae		2
TOTAL		810	644

UID = unidentified due to lack of size and/or missing morphological characters.

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katie.babin@nyrstar.com
craig.schweitzer@nyrstar.com
Ruth.Kish@nyrstar.com

Inv. # 1083

FES Sample Number		180168	180169
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		June 27, 2018	
Time		10:20:00 AM	11:15:00 AM
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<u>Diacyclops thomasi</u>	adult	171	48
UID	copepodid	99	25
<u>Order : Calanoida</u>			
Skistodiaptomus oregonensis	adult	39	18
UID	copepodid	44	15
UID Calanoida / Cyclopoida	nauplii	484	185
<u>Sub-class : Branchiopoda</u>			
<u>Bosmina longirostris</u>	adult	638	225
<u>Daphnia rosea</u>	adult	374	340
<u>Daphnia rosea</u>	juvenile	17	18
Holopedium gibberum	adult	358	53
<u>Polyphemus pediculus</u>	adult	61	15
<u>Scapholeberis rammneri</u>	adult	11	3
<u>Phylum : Rotifera</u>			
Kellicottia longispina		39	40
Keratella cochlearis		6	
Keratella quadrata		17	8
UID			20
TOTAL		2,358	1,013

UID = unidentified due to lack of size and/or missing morphological characters.

Total

2358

1013

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katie.babin@nyrstar.com
craig.schweitzer@nyrstar.com
Ruth.Kish@nyrstar.com

Inv. # 1088

FES Sample Number		180188	180189
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		August 17, 2018	
Time		11:25:00 AM	12:25:00 PM
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<u>Cryptocyclops bicolor</u>	adult	16	16
Diacyclops thomasi	adult	143	143
<u>UID</u>	copepodid	71	99
Order : Calanoida			
Skistodiaptomus oregonensis	adult	30	53
UID	copepodid	43	59
UID Calanoida / Cyclopoida	nauplii	478	462
<u>Sub-class : Branchiopoda</u>			
<u>Bosmina longirostris</u>	adult	360	205
<u>Daphnia rosea</u>	adult	295	495
Daphnia rosea	juvenile	6	
<u>Holopedium gibberum</u>	adult	12	
<u>Leptodora kindtii</u>		6	
<u>Polyphemus pediculus</u>	adult	195	112
Phylum : Rotifera			
Conochilus sp.	colonies	248	205
Kellicottia longispina		490	970
Keratella cochlearis		24	7
<u>Keratella quadrata</u>		18	26
UID		53	33
Benthic			
Group : Hydracarina		27	7

TOTAL	2515	2892
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craig.schweitzer@nyrstar.com
Ruth.Kish@nyrstar.com

Inv. # 1088

FES Sample Number		180200	180201
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		October 3, 2018	
Time		11:10:00 AM	
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<i>Diacyclops thomasi</i>	adult	209	707
Microcyclops varicans	adult	90	303
<i>UID</i>	copepodid	105	223
Order : Calanoida			
Skistodiaptomus oregonensis	adult	65	114
UID	copepodid	6	5
UID Calanoida / Cyclopoida	nauplii	179	273
<i>Sub-class : Branchiopoda</i>			
<i>Bosmina longirostris</i>	adult	31	55
<i>Daphnia rosea</i>	adult	554	410
Daphnia sp.	juvenile		9
<i>Polyphemus pediculus</i>	adult	6	5
<i>Scapholeberis rammneri</i>	adult	3	
<i>Sida crystallina</i>	adult	12	46
Phylum : Rotifera			
Conochilus sp.	colonies	6	5
Kellicottia longispina		148	446
Keratella cochlearis		49	27
<i>UID</i>		3	5
Benthic			
Group : Hydracarina			3

TOTAL	1469	2633
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UID = unidentified due to lack of size and/or missing morphological characters.

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Nicole.Pesonen@nyrstar.com
craig.schweitzer@nyrstar.com
Ruth.Kish@nyrstar.com

Inv. # 1094

FES Sample Number		180272	180273
Site Name		Buttle Lake	
Site #		Karst Creek	Henshaw Creek
Sample Date		December 5, 2018	
Time			
units	stage	total organisms / sample	
Sub-class : Copepoda			
Order : Cyclopoida			
<i>Cryptocyclops bicolor</i>	adult		7
Diacyclops thomasi	adult	15	5
<i>Microcyclops varicans</i>	adult	34	17
UID	copepodid	12	12
Order : Calanoida			
Skistodiaptomus oregonensis	adult	24	19
UID	copepodid		1
<i>UID Calanoida / Cyclopoida</i>	nauplii	109	199
<i>Sub-class : Branchiopoda</i>			
<i>Bosmina longirostris</i>	adult	8	7
Daphnia rosea	adult	330	261
<i>Daphnia rosea</i>	juvenile	9	
<i>Daphnia sp.</i>	juvenile		1
<i>Phylum : Rotifera</i>			
Kellicottia longispina		14	68
Keratella cochlearis		12	32
Keratella quadrata		13	4
UID		5	4
Benthic			
Group : Hydracarina			2
TOTAL		587	637

UID = unidentified due to lack of size and/or missing morphological characters.

Appendix F

Groundwater Results

Well Name	Depth to Water (m)	Well Depth (m)	Conductivity (µS/cm)	pH	t (°C)	Notes
MW13-01	3.09	11	560	7.33	4.2	purged dry - sample taken next day
MW11-01	26.77	31				Too deep for sampling equipment
MW11-02	5	9.4	523	5.05	5.8	
MW13-02D	16.57	35.4				Too deep for sampling equipment
MW13-02S	17.03	23.5				Too deep for sampling equipment
MW14-01D	23.02					Too deep for sampling equipment
MW14-01S	25.28					Too deep for sampling equipment
MW14-02D						unsafe to access due to construction
MW14-05D	11.86	21.86	297	7.01	6.4	
MW14-05M	12.23	15.03	344	6.88	6.9	
BK01-13D	11.35	22.69	145	7.32	6.6	
BK01-13S	11.44	14.79	180	6.29	6.7	pump stopped at 25L, possibly purged dry, will revisit
MW11-04	3.3	7.14	693	5.26	7.4	
MW-G	2.67	8.67	159.6	5.76	5.6	
MW13-05D	17.31	26.99				Too deep for sampling equipment
MW13-05S	14.49	14.6				Dry
MW13-06D	17.67	49.52				Too deep for sampling equipment
MW13-06S	17.82	17.82				Dry
MW13-19	2.84	20.1	118	5.4	6.4	
MW14-03D	18.35	36.74				could not advance pump past 23m
MW14-03S	18.5	22.45				Too deep for sampling equipment
MW14-04D	16.07	22.82				Too deep for sampling equipment
MW14-04S	6.91	6.91				Dry
MW04-01	8.4	11.9	78.4	7.3	7	
MW13-11D	6.79	14.5	614	6.22	9.3	
MW13-11S	6.79	7.8	704	7.34		Manually bailed sample was filled with fines, TSS was 668 mg/L
MW13-12	10.32	15.5	77	6.78	2.8	
MW13-13	7.61	14.2	243	6.38	6.5	
MW13-04	9.6	11.7	242	7.3	6.3	
MW11-05D	39.08	43.3				Too deep for sampling equipment
MW11-05S	6.23	10.6				Purged dry. Return next day for sample
TD13-01D	35.3	44.2				Too deep for sampling equipment
TD13-02D	28.56	38.16				Too deep for sampling equipment
TD13-02S	20.44	25.6				Too deep for sampling equipment
TD13-03D	38.26	47.6				Too deep for sampling equipment
TD13-04D	41.28	44.5				Too deep for sampling equipment
TD13-05D	31.43	39.83				Too deep for sampling equipment
TD13-05S	18.23	23.2				Too deep for sampling equipment
MW-A	11.2	22.8	466	5.95	8.9	
MW-C	4.86	15.7	294.3	6.16	8.2	
MW-D	11.25	17.3	722	6.6	8	
MW-F	4.68	6.2				obstruction, could not advance pump into water column
MW13-14D	7.04	18.55	300	6.17	7.7	
MW13-14S	7.41	11.6	412.4	6.44	7.9	
MW13-15D	6.82	19.2	266.4	7.02	7.6	
MW13-15S	6.92	12.41	300	2.98	8	
MW13-16D	11.68	20.82	112.4	8.56	6.6	
MW13-16S	11.86	15.33	71.2	9.66	6.1	
MW13-17	6.2	9.55	275	8.18	5.3	
MW13-18D	5.36	24.05	359	6.54	7.3	
MW13-18S	4.87	14.46	234	6.6	6.5	
Old Drain IN	4.71		324	6.12	7.2	
Old Drain OU	4.71		1034	5.16	8.3	orange colour for first 5L
Drain LONG	4.01		398	6.26	6.7	
Drain MED	4.85		375	6.19	7.1	
Drain SHORT	4.84		466	6.49	6.4	
MW17-01	24.73	23.77				Dry - Water level meter indicated bottom of well below absolute depth
MW17-02D	23.25	34.14				Too deep for sampling equipment
MW17-02S	22.93	23.19				Dry - Water level meter stopped at 22.93m. Possible infill?
MW17-03		40.79				Unable to locate
MW17-04	7.74	9.75	228	7.21	4.6	
MW17-05	5.78	8.53	217	6.99	5.5	
MW17-06	25.6	25.6				Dry
MW17-07	5.26	9.14	209	6.74	5.8	
MW17-08	4.71	7.01	473	6.56	5.9	
MW17-09	5.1	12.19	421	7.17	7.7	purged dry - cloudy and orange, return to sample in 2-3 days - on return water level at 5.1m sample taken
MW17-10S	10.97	10.97				Dry
MW17-10D	11.37	21.34	549	6.8	7.6	
MW17-11S	10.27	13.72	109	7.39	6.2	
MW17-11D	10.47	18.59	98	7.41	5.9	
MW17-13S	8.87	17.37	171	5.72	6.3	
MW17-13D	8.88	30.48	818	2.89	5.4	stopped pumping after 10L - water in column was very cloudy and red in colour (sample bottle retrieved)
MW17-14S	12.46	15.24	125	5.85	5.9	
MW17-14D	12.55	25.3	151	6.18	6.2	
MW17-15S	8.3	10.67	111.1	8.24	6.8	
MW17-15D	8.29	18.29	60.5	8.72	5.4	

Well Name	Date	Depth to Water (m)	Well Depth (m)	Theoretical Purge Volume (rounded to nearest 10)	Volume Purged (L)	Conductivity (µS/cm)	pH	t (°C)	Notes
BK01-13D	01/05/2018	10.91	22.69	70	N.A.				Damaged - sand infiltrating into well
BK01-13S	16/05/2018	10.65	14.79	30	25	356	5.75	7.7	
MW11-04	23/05/2018	4.33	7.14	20	30	261	5.79	7.8	
MW-G	23/05/2018	3.26	8.67	30	35	155	6.54	7.6	
MW13-05D	31/05/2018	16.82	26.99	60	70	300	6.3	8.6	
MW13-05S	31/05/2018	14.6	14.6	0					Dry
MW13-06D	31/05/2018	17.13	49.52	200	200	385	6.01	8.6	
MW13-06S	31/05/2018	17.82	17.82	0					Dry
MW13-19	23/05/2018	4	20.1	100	100	115	7.19	7	
MW14-03D	26/05/2018	16.65	36.74	120	120	150	7.13	8.5	
MW14-03S	26/05/2018	17.75	22.45	30	30	280	6.96	9.1	Cloudy
MW14-04D	30/05/2018	16.73	22.82	40	40	620	5.08	11.8	
MW14-04S	30/05/2018	6.4	6.91	0					Dry
MW13-04	25/05/2018	9.47	11.7	10	15	265	7.36	7.4	
MW11-05D	01/06/2018	39.01	42.1	20	20	800	5.16	10.1	
TD13-01D	01/06/2018	35.35	44.2	50	50	1600	4.3	10.3	
TD13-02D	01/06/2018	26.33	38.16	70	70	1096	4.25	10.6	
TD13-03D	01/06/2018	32.15	47.6	90	90	1224	4.26	9.2	
TD13-04D	01/06/2018	43.22	44.5	10					Dry
TD13-05D	01/06/2018	31.43	39.83	50	50	1204	4.15	9.4	
MW-A	31/05/2018	11.65	22.8	70	25	644	4.3	10.1	
MW-C	31/05/2018	6.37	15.7	60	20	737	5.56	8	
MW-D	31/05/2018	11.67	17.3	30	20	737	4.47	9	
MW-F	31/05/2018	4.94	6.2	10	20	69	6.66	12.2	
MW13-14D	24/05/2018	6.6	18.55	70	70	519	4.93	8.4	
MW13-14S	24/05/2018	6.96	11.6	30	30	512	4.72	8.5	
MW13-15D	24/05/2018	6.35	19.2	80	80	360	6.02	7.9	
MW13-15S	24/05/2018	6.24	12.41	40	40	326	5.81	8.7	
MW13-16D	24/05/2018	11.21	20.82	60	60	183	7.31	8.4	
MW13-16S	24/05/2018	11.48	15.33	20	25	140	7.12	7.7	
MW13-17	24/05/2018	6.7	9.55	20	20	236	7.16	8.7	cloudy
MW13-18D	25/05/2018	4.96	24.05	120	120	553	7.53	7.4	
MW13-18S	25/05/2018	4.45	14.46	60	60	342	7.9	7.1	
MW17-01	30/05/2018	23.77	23.77	0					Dry
MW17-02S	02/06/2018	22.88	23.19	0					Dry
MW17-02D	02/06/2018	23.82	34.14	60					Requires redevelopment
MW17-03	02/06/2018	12.81	40.79	170					Requires redevelopment
MW17-04	25/05/2018	7.09	9.75	20	20	154	6.71	7.7	
MW17-05	25/05/2018	5.4	8.53	20	20	211	6.34	7.5	
									After first 3L, water came out very cloudy and thick, sampling could lead to pump damage
MW17-06	30/05/2018	22.24	25.6	20					
MW17-07	25/05/2018	4.92	9.14	30	25	185	5.86	7.4	
MW17-08	24/05/2018	4.08	7.01	20	20	494	6.48	8	
MW17-09	24/05/2018	5.07	12.19	40	40	177	7.98	9.4	Purged dry, returned next day to sample
MW17-10S	24/05/2018	10.97	10.97	0					Dry
MW17-10D	24/05/2018	10.97	21.34	60	70	612	7.17	7.8	
MW17-11S	31/05/2018	10.37	13.72	20	20	136	6.7	7.7	
MW17-11D	31/05/2018	10.23	18.59	50	50	127	6.31	6.7	
MW17-13S	31/05/2018	8.75	17.37	50	50	184	7.31	6.7	
MW17-13D	31/05/2018	8.7	30.48	130	120	5.26	4.9	7.7	
									Periodic flushes of red particles in purge water. Sample clear after purge complete
MW17-14S	24/05/2018	12.17	15.24	20	20	220	7.1	7.2	
									Periodic flushes of red particles in purge water. Sample clear after purge complete
MW17-14D	24/05/2018	12.23	25.3	80	80	135	7.28	8.2	
MW17-15S	31/05/2018	9.63	10.67	10	20	118	5.71	7.8	
MW17-15D	31/05/2018	9.65	18.29	50	54	149	6.52	7.6	
Old Drain IN	24/05/2018	6.23	5.99	0		545	5.65	9.4	
Old Drain OUT	24/05/2018	5.99	6.23	0		1500	4.52	9.5	
Drain LONG	24/05/2018	3.95	3.95	0		311	6.51	8.5	
Drain MED	24/05/2018	5.65	5.65	0		317	5.46	8.6	
Drain SHORT	24/05/2018	4.84	4.84	0		360	6.05	7.9	

Well Name	Depth to Water (m)	Well Depth (m)	t (°C)	pH	Conductivity (µS/cm)	Notes
MW13-01	4.04	11	9.3	7.16	217	
MW11-01	26.42	31	9.6	6.21	198	
MW11-02	4.17	9.4	7.4	5.6	319	
MW13-02D	16.33	35.4	8.7	7.42	292	
MW13-02S	15.62	23.5	6.8	7.21	163	
MW14-01D	24.94	32.9				no water came out (pump functional)
MW14-01S	24.01	24.22				dry
MW14-02D	19.14	22.9	14.8	5.34	485	
MW14-05D	13.68	21.87	7	7.08	253	
MW14-05M	13.17	15.03	7.2	7.12	298	
BK01-13D	11.17	22.69	8.1	6.77	46	
BK01-13S	11.82	14.79	8.3	5.82	197	
MW11-04	5.27	7.14	9.9	5.56	233	
MW-G	4.11	8.67	8	6.32	166	
MW13-05D	17.85	26.99	8.6	6.5	212	
MW13-05S	14.6	14.6				Dry
MW13-06D	18.1	49.52	8.5	6.21	156	
MW13-06S	17.82	17.82				Dry
MW13-19	5.23	20.1		7.5	95	
MW14-03D	18.22	36.74	8.1	6.57	112	
MW14-03S	18.36	22.45	9.6	6.21	198	
MW14-04D	17.1	22.82	10.2	6.1	489	
MW14-04S	6.91	6.91				Dry
MW04-01	6.5	11.9	8.8	6.99	73	
MW13-11D	7.03	14.5	11	7.02	428	
MW13-11S	7.06	7.8	13.7	6.79	275	
MW13-12	10.73	15.5	15.6	6.6	101	
MW13-13	8.05	14.2	10.7	6.54	146	
MW11-05D	38.88	43.3	11.4	4.65	415	
TD13-01D	35.46	44.2	10.8	4.35	1280	
TD13-02D	27.46	38.16	10.3	4.96	46.9	
TD13-03D	38.12	47.6	11.9	4.27	757	
TD13-04D	44.5	44.5				dry
TD13-05D	31.48	39.83	13.4	4.2	1004	
MW-A	12.23	22.8	12.1	5.34	600	
MW-C	5.27	15.7	9	6.13	384	
MW-D	12.67	17.3	10.6	4.68	767	
MW-F	6	6.2				DRY
MW13-14D	7.57	18.55	10.1	5.38	415	
MW13-14S	7.93	11.6	9	5.11	355	
MW13-15D	7.23	19.2	10.4	6.67	256	
MW13-15S	7.32	12.41	10.2	6.89	219	
MW13-16D	12.04	20.82	14	7.48	253.4	
MW13-16S	12.17	15.33	8.6	7.31	99	
MW13-17	6.45	9.55	13.8	6.55	201	
MW13-18D	5.25	24.05	8.1	7.11	499	
MW13-18S	4.74	14.46	7.8	7.2	287	
Old Drain IN	6.2		10.7	4.74	730	
Old Drain OUT	6.22		9.3	5.51	219	
Drain LONG	4.93		10.9	5.97	291	
Drain MED	6.54		12.8	5.53	309	
Drain SHORT	5.51		10	6.3	232	
MW17-01	23.77	23.77				DRY
MW17-02S	23.1	23.19				DRY
MW17-02D	23.33	34.14	10.8	5.08	187	
MW17-03	26.26	40.79	11.1	3.56	685	
MW17-04	7.86	9.75	13.5	7.29	136	
MW17-05	5.95	8.53	11.7	7.19	137	
MW17-06	23.4	25.6				no pumping
MW17-07	5.41	9.14	14.7	7.32	137	
MW17-08	4.88	7.01	8.8	6.51	279	
MW17-09	5.67	12.19	12.8	7.57	229	
MW17-10S	10.97	10.97				dry
MW17-10D	11.66	21.34	7.6	7.16	567	
MW17-11S	12	13.72	7.2	7.2	125	
MW17-11D	11.92	18.59	6.6	7.02	116	
MW17-13S	9.21	17.37	6.9	7.48	236	
MW17-13D	9.81	30.48	7.3	6.6	342	
MW17-14S	13.57	15.24	9	7.25	153	
MW17-14D	13.57	25.3	9.1	7.85	184	
MW17-15S	10.67	10.67				dry
MW17-15D	11.68	18.29	7.9	7.33	239	
MW18-06S	6.05	9.75	9.7	5.42	349	
MW18-06D	6.09	18.29	7.9	5.32	216	
MW18-07S	4.95	7.62				DRY
MW18-07D	5.26	15.24	7.2	6.4	169	
MW18-08S	6.09	7.1	10	6.64	232	
MW18-08D	6.12	10.36	7.9	6.59	196	

Well Name	Depth to Water (m)	Well Depth (m)	t (°C)	pH	Conductivity (µS/cm)	Notes
BK01-13D	10.75	22.69	6.5	6.5	88.7	
BK01-13S	10.85	14.79	7.1	5.58	246.1	
MW11-04	4.55	7.14	9.2	5.79	215.6	
MW-G	3.45	8.67	7.5	6.25	128	
MW13-05D	16.55	26.99	7.1	6.31	177.4	
MW13-05S	14.6	14.6	NA	NA	NA	Dry
MW13-06D	17.2	49.52	7.3	6.24	129.1	
MW13-06S	17.82	17.82	NA	NA	NA	Dry
MW13-19	4.28	20.1	6.1	6.9	70.4	
MW14-03D	17.66	36.74	7.1	6.77	90.4	
MW14-03S	17.73	22.45	7.1	6.21	183.3	
MW14-04D	ALEX	22.82		6.34	537	
MW14-04S	6.9	6.91	NA	NA	NA	Dry
MW13-04	9.44	11.7	8.5	6.85	250.8	
MW11-05D	35.47	43.3	9.3	5.38	533	
TD13-01D	34.57	44.2	9.8	4.44	1212	
TD13-02D	26.87	38.16	8.3	4.82	705	
TD13-03D	37.19	47.6				Pump malfunction, controller needed to dry
TD13-04D	38.97	44.5				Only 2 L of water in well, probe came up muddy
TD13-05D	30.85	39.83	8.9	4.78	806	
MW-A	11.47	22.8	7.8	4.55	704	
MW-C	4.45	15.7	7.9	5.91	866	
MW-D	11.86	17.3	8.1	4.75	807	
MW-F	6.1	6.2	NA	NA	NA	Dry
MW13-14D	6.69	18.55	7.9	5.44	60.4	
MW13-14S	7	11.6	7.9	5.43	346	
MW13-15D	6.05	19.2	7.8	6.91	270	
MW13-15S	6.14	12.41	8.1	6.62	260.7	
MW13-16D	10.81	20.82	6.7	7.03	149.3	
MW13-16S	11.03	15.33	6.6	6.69	155.2	
MW13-17	5.52	9.55	12.1	5.95	416.4	
MW13-18D	4.71	24.05	7.5	7	467.2	
MW13-18S	4.14	14.46	8	6.79	291.6	
Old Drain IN	6.08		8.9	4.76	789	
Old Drain OUT	5.99		7.9	5.76	393.3	
Drain LONG	3.58		8.4	6.33	236	
Drain MED	5.55		8.6	5.82	291.5	
Drain SHORT	4.33		9.7	6.47	414.1	
MW17-01	23.77	23.77	NA	NA	NA	Dry
MW17-02S	23.19	23.19	NA	NA	NA	Dry
MW17-02D	ALEX	34.14		6.41	196	
MW17-03	ALEX	40.79		3.93	414	
MW17-04	7.33	9.75	9.1	6.96	214.6	
MW17-05	5.44	8.53	7.1	6.95	15.24	
MW17-06	23.07	25.6	5.9	6.14	697	
MW17-07	4.96	9.14	7.5	7.14	146.7	
MW17-08	4.23	7.01	7.9	6.6	293.2	
MW17-09	4.37	12.19	10.5	7.52	193	
MW17-10S	10.97	10.97	NA	NA	NA	Dry
MW17-10D	10.67	21.34	7.6	7.07	514	
MW17-11S	8.62	13.72	6.2	6.47	101.4	
MW17-11D	8.46	18.59	5.9	6.82	91.9	
MW17-13S	7.8	17.37	6.9	3.52	948	
MW17-13D	8.53	30.48	7.4	3.91	801	
MW17-14S	11.45	15.24	7.2	6.57	123.2	
MW17-14D	11.49	25.3	6.6	7.06	154.1	
MW17-15S	7.55	10.67	9.1	6.44	132.5	
MW17-15D	7.67	18.29	7.9	6.66	192.1	
MW18-06S	5.22	9.75	7.1	5.51	247.6	
MW18-06D	5.2	18.29	6.5	5.54	194.9	
MW18-07S	4.37	7.62	8.9	6.65	372.8	
MW18-07D	4.37	15.24	6.7	5.94	154.3	
MW18-08S	5.3	7.1	7.6	6.52	270.4	
MW18-08D	5.31	10.36	6.4	6.2	156.9	

1. Samples were attempted at MW-F in each season, water was only obtainable during the spring sampling

Well	Sample Date	Dissolved Sulphate (mg/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Adjusted Alkalinity (mg/L)	Dissolved Cadmium (ug/L)	Dissolved Iron (ug/L)
MW11-05D	28/11/2018	194	13.9	356	4.3	0.171	6940
MW11-05S	24/03/2018	1630	2.53	327	48.1	0.553	58.7
TD13-01D	01/06/2018	1040	8250	44200	1	145	113
TD13-01D	12/09/2018	736	5710	31600	1	105	82.2
TD13-01D	08/11/2018	816	7060	39500	1	132	372
TD13-02D	01/06/2018	588	1440	19100	1	43.9	80.2
TD13-02D	12/09/2018	195	443	5790	1	13.4	28.2
TD13-02D	08/11/2018	392	1020	14900	1	34.9	54.3
TD13-03D	01/06/2018	650	1760	19000	1	54.7	566
TD13-05D	01/06/2018	656	2120	18100	1	51.5	2960
TD13-05D	08/11/2018	475	2160	17100	1	48.2	324

Well	Sample Date	Sulphate (ug/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Adjusted Alkalinity (mg/L)	Dissolved Cadmium (ug/L)	Dissolved Iron (ug/L)
MW11-04	09/02/2018	501	1650	22800	1	50	105
	23/05/2018	91.7	98.5	1950		3.88	1
	25/08/2018	96.2	117	1990	6.6	3.83	6.3
	24/10/2018	86.8	90.9	1950	5.8	3.96	8.9
	31/10/2018	108	119	2310	7.5	4.97	1
MW13-05D	31/05/2018	96.5	31.4	800	21.9	2.24	13.4
	01/06/2018	318	82.9	7920	1	9.43	41.9
	08/09/2018	63.6	12.7	526	22.2	1.43	5.8
	01/11/2018	70.8	21	641	26.3	1.76	6
MW13-06D	02/09/2018	53.6	41.1	3250	14.8	2.49	1
	31/05/2018	155	125	7810	12.9	6.67	17.2
	01/11/2018	50.2	35.7	2980	14.7	2.14	33.5
MW16-01	08/02/2018	291	39.3	4600	43.3	8.39	1
	24/10/2018	288	5.91	597	88.8	2.21	1
	28/11/2018	221	99.5	1360	31.6	5.13	7.3
MW16-02	08/02/2018	260	627	3910	1	15.1	20.6
	24/10/2018	682	172	5520	31.2	25.8	5.9
	28/11/2018	308	686	2530	1	12.8	2960
MW16-03	08/02/2018	386	26.1	2640	50.8	8.02	1
MW-G	09/02/2018	89.8	14.3	980	22.9	1.18	1
	23/05/2018	39	5.45	452		0.518	1
	25/08/2018	47.1	9.78	552	26.6	0.697	9
	31/10/2018	46.8	9.12	485	24	0.727	1.4

Well	Sample Date	Sulphate (ug/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Adjusted Alkalinity (mg/L)	Dissolved Cadmium (ug/L)	Dissolved Iron (ug/L)
MW13-16D	21/03/2018	37.8	3.07	3.91	39.2	0.0107	2
MW13-16D	24/05/2018	34.1	1.26	0.27	45.7	0.005	1
MW13-16D	31/08/2018	43.7	0.234	4.85	46.5	0.0126	10.8
MW13-16D	02/11/2018	41.9	0.347	3.63	42.5	0.0147	1
MW13-16S	21/03/2018	12.3	2.3	97.5	35.4	0.3	1
MW13-16S	24/05/2018	17.2	2.13	102	43.2	0.339	1
MW13-16S	31/08/2018	21	1.72	65.7	42.2	0.264	1.3
MW13-16S	02/11/2018	45	5.08	533	43.2	1.13	1
MW13-17	21/03/2018	88.8	4.13	95.3	32.7	0.54	1
MW13-17	24/05/2018	71.1	5.71	100	37.5	0.549	1
MW13-17	30/08/2018	50.5	6.03	80.3	50.8	0.5	1
MW13-17	02/11/2018	176	24.5	247	40.8	1.82	2.3
MW13-18D	21/03/2018	193	1.3	4.18	84.9	0.0129	1
MW13-18D	25/05/2018	179	0.214	3.1	86	0.0126	1
MW13-18D	13/09/2018	182	1.4	6.17	87.2	0.0312	1.2
MW13-18D	02/11/2018	204	2.74	5.3	87.3	0.0221	3.9
MW13-18S	21/03/2018	120	0.528	42.4	59.2	0.059	1.1
MW13-18S	25/05/2018	88.1	0.204	38.6	54.3	0.0512	1
MW13-18S	13/09/2018	95.7	0.465	61.2	49.2	0.0679	1
MW13-18S	02/11/2018	116	16.6	111	55.1	0.218	19.6

Well	Sample Date	Sulphate (ug/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Adjusted Alkalinity (mg/L)	Dissolved Cadmium (ug/L)	Dissolved Iron (ug/L)
MW17-09	23/03/2018	57.2	5.53	57.8	164	0.544	2.3
MW17-09	25/05/2018	11.3	0.27	0.83	65.4	0.005	1
MW17-09	29/08/2018	8.9	3.44	20.6	96.6	0.248	9.1
MW17-09	02/11/2018	18	6.51	104	88	0.248	2.2
MW17-10D	22/03/2018	200	0.212	37.7	86.1	0.0496	1.1
MW17-10D	24/05/2018	219	0.334	49.6	91.7	0.0324	1
MW17-10D	06/09/2018	229	0.609	48.6	88.7	0.0395	4.5
MW17-10D	03/11/2018	214	0.449	43.9	88.9	0.0363	1.8
MW17-11D	22/03/2018	1	0.101	0.17	52.7	0.005	1
MW17-11D	31/05/2018	1.6	0.117	0.25	57.5	0.005	1
MW17-11D	06/09/2018	1.6	0.093	0.77	63	0.0078	1
MW17-11D	03/11/2018	2.2	2.93	4.72	58.8	0.0361	13.6
MW17-11S	22/03/2018	3.2	0.17	0.22	59.6	0.005	1
MW17-11S	31/05/2018	2.7	0.137	0.23	65.3	0.005	1
MW17-11S	06/09/2018	1.6	0.098	0.48	68.4	0.0063	3.6
MW17-11S	03/11/2018	4	2.66	3.02	58.4	0.0276	6.4
MW17-13D	06/04/2018	372	3.98	1494	67	9.18	922
MW17-13D	31/05/2018	460	598	5440	2	24.2	11760
MW17-13D	06/09/2018	274	18.28	145.6	91	1.54	29.4
MW17-13D	03/11/2018	944	1452	15940	2	70.4	82400
MW17-13S	22/03/2018	24.5	0.192	0.27	61.5	0.0061	23.9
MW17-13S	31/05/2018	30.3	0.221	0.37	68	0.009	1
MW17-13S	06/09/2018	50.9	0.37	1.68	71.7	0.0119	8.2
MW17-13S	03/11/2018	612	1770	11500	1	48.1	68700
MW17-14D	22/03/2018	10.8	0.198	8.48	77.2	0.0268	51.5
MW17-14D	24/05/2018	6.1	0.25	23.7	47	0.0181	1
MW17-14D	06/09/2018	8	8.94	14.6	77.2	0.0856	16.9
MW17-14D	03/11/2018	10.7	0.907	20.3	87.3	0.114	49.7
MW17-14S	22/03/2018	18	0.849	19.7	44.4	0.0222	295
MW17-14S	24/05/2018	223	295	4460	12.1	9.22	1
MW17-14S	06/09/2018	4.1	1.26	19.6	61	0.028	19.4
MW17-14S	03/11/2018	16.1	0.923	15	61.2	0.093	52.8
MW17-15D	21/03/2018	11.8	0.288	0.81	54.5	0.005	42.4
MW17-15D	31/05/2018	15.1	0.236	0.72	63.9	0.0123	1
MW17-15D	13/09/2018	18.9	2.79	6.2	81.1	0.0901	41.4
MW17-15D	03/11/2018	9	0.443	1.69	102	0.0248	1.4
MW17-15S	21/03/2018	6	0.295	2.96	35.6	0.017	7.7
MW17-15S	31/05/2018	4.8	0.305	3.35	48.1	0.0618	1
MW17-15S	03/11/2018	6.1	1.32	19.6	91.2	0.0832	8

Well	Sample Date	Dissolved Sulphate (mg/L)	Dissolved Copper (mg/L)	Dissolved Zinc (mg/L)	Adjusted Alkalinity (mg/L)	Dissolved Cadmium (mg/L)	Dissolved Iron (mg/L)
OUT-DRAIN	21/03/2018	898	3.98	34	1	0.102	19.8
	24/05/2018	98	0.0894	1.78	32.4	0.00375	0.001
	30/08/2018	206	0.523	5.82	5.2	0.0139	1.26
	02/11/2018	192	0.324	3.9	12.8	0.00903	0.662
IN-DRAIN	21/03/2018	199	0.159	3.26	20.9	0.00632	0.613
	24/05/2018	926	4.71	33.3	1	0.115	2.57
	30/08/2018	546	2.87	21.3	1	0.0693	5.88
	02/11/2018	483	2.77	17.7	1	0.0642	5.23
L-DRAIN	21/03/2018	265	0.31	5.97	12.9	0.011	0.0495
	30/08/2018	165	0.245	3.26	11.8	0.00658	0.0031
	02/11/2018	110	0.11	1.7	23.3	0.00345	0.0049
M-DRAIN	21/03/2018	251	0.572	5.27	1	0.0142	0.945
	24/05/2018	120	0.0173	1.12		0.00203	0.0016
	30/08/2018	171	0.325	3.66	1.2	0.00804	0.25
	02/11/2018	147	0.201	2.54	6.6	0.00535	0.0869
S-DRAIN	21/03/2018	332	0.853	9.62	1	0.0229	1.21
	24/05/2018	120	0.000273	0.00149		0.0000138	0.001
	30/08/2018	111	0.0243	1.01	42.3	0.00173	0.0059
	02/11/2018	160	0.017	0.905	83.1	0.00215	0.0036

Appendix G

QA/QC Sampling

Sampling Date	BLANKS		DUPLICATES				
	15/02/2018		#####	#####			
	MTB	RDL	HEN-20	HEN-20 D	RPD	Within 2x DL?	RDL
ANIONS							
Silica	<0.50	0.50	2.93	2.99	2%	No	0.5
Calculated Parameters					BDL	No	
Filter and HNO3 Preservation	LAB		LAB	LAB	BDL	No	
Nitrate (N)	<0.0020	0.0020	0.0297	0.0289	3%	No	0.002
Anions					BDL	No	
Dissolved Sulphate (SO4)	<1.0	1.0	5.9	5.9	0%	No	1
MISCELLANEOUS					BDL	No	
Chlorophyll a					BDL	No	
Nutrients					BDL	No	
Dissolved Phosphorus (P)	0.0023	0.0020	<0.015	<0.015	BDL	No	0.015
Total Ammonia (N)	<0.020	0.020	0.0029	0.0034	16%	Yes	0.002
Nitrate plus Nitrite (N)	<0.0020	0.0020	0.0297	0.0289	3%	No	0.002
Nitrite (N)	<0.0020	0.0020	<0.0020	<0.0020	BDL	No	0.002
Total Phosphorus (P)	0.0027	0.0020	0.0035	0.0034	3%	Yes	0.002
Physical Properties					BDL	No	
Conductivity	<2.0	2.0	64.3	64.5	0%	No	2
pH	5.39		7.57	7.57	0%	No	
Physical Properties					BDL	No	
Total Suspended Solids	<4.0	4.0	<4.0	<4.0	BDL	No	4
Turbidity	0.14	0.10	0.24	0.28	15%	No	0.1
Calculated Parameters					BDL	No	
Total Hardness (CaCO3)	<0.50	0.50	28.4	28.7	1%	No	0.5
Total Metals by ICPMS					BDL	No	
Total Aluminum (Al)	0.00098	0.00050	0.0231	0.0239	3%	No	0.0005
Total Antimony (Sb)	<0.000020	0.000020	<0.000020	0.000022	BDL	Yes	0.00002
Total Arsenic (As)	<0.000020	0.000020	0.000139	0.000154	10%	No	0.00002
Total Barium (Ba)	0.000076	0.000020	0.00503	0.00493	2%	No	0.00002
Total Beryllium (Be)	<0.000010	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	<0.010	0.010	<0.010	<0.010	BDL	No	0.01
Total Cadmium (Cd)	<0.0000050	0.0000050	0.0000392	0.0000418	6%	No	0.000005
Total Chromium (Cr)	<0.00010	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Total Cobalt (Co)	<0.0000050	0.0000050	0.0000137	0.0000153	11%	No	0.000005
Total Copper (Cu)	0.000175	0.000050	0.000953	0.000938	2%	No	0.00005
Total Iron (Fe)	0.0013	0.0010	0.0108	0.0123	13%	No	0.001
Total Lead (Pb)	<0.0000050	0.0000050	0.000051	0.000055	8%	No	0.000005
Total Lithium (Li)	<0.00050	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Total Manganese (Mn)	<0.000050	0.000050	0.00354	0.00354	0%	No	0.00005
Total Molybdenum (Mo)	<0.000050	0.000050	0.000132	0.000129	2%	No	0.00005
Total Nickel (Ni)	<0.000020	0.000020	0.000062	0.000054	14%	No	0.00002
Total Selenium (Se)	<0.000040	0.000040	0.000057	0.000064	12%	Yes	0.00004
Total Silicon (Si)	<0.050	0.050	1.46	1.45	1%	No	0.05
Total Silver (Ag)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Total Strontium (Sr)	0.000088	0.000050	0.0155	0.0154	1%	No	0.00005
Total Thallium (Tl)	<0.0000020	0.0000020	<0.0000020	<0.0000020	BDL	No	0.000002
Total Tin (Sn)	<0.00020	0.00020	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	<0.0000020	0.0000020	0.0000115	0.0000094	20%	No	0.000002
Total Vanadium (V)	<0.00020	0.00020	0.00029	0.00031	7%	Yes	0.0002
Total Zinc (Zn)	0.00037	0.00010	0.0142	0.0138	3%	No	0.0001
Total Zirconium (Zr)	<0.00010	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	<0.050	0.050	10.1	10.2	1%	No	0.05
Total Magnesium (Mg)	<0.050	0.050	0.759	0.766	1%	No	0.05
Total Potassium (K)	<0.050	0.050	0.065	0.066	2%	Yes	0.05
Total Sodium (Na)	<0.050	0.050	0.71	0.712	0%	No	0.05
Total Sulphur (S)	<3.0	3.0	<3.0	<3.0	BDL	No	3
Calculated Parameters					BDL	No	
Dissolved Hardness (CaCO3)	<0.50	0.50	29.2	28.4	3%	No	0.5
Dissolved Metals by ICPMS					BDL	No	
Dissolved Aluminum (Al)	<0.00050	0.00050	0.0176	0.0172	2%	No	0.0005
Dissolved Antimony (Sb)	<0.000020	0.000020	0.000022	<0.000020	BDL	Yes	0.00002
Dissolved Arsenic (As)	<0.000020	0.000020	0.000132	0.000135	2%	No	0.00002
Dissolved Barium (Ba)	<0.000020	0.000020	0.00506	0.00491	3%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	0.010	<0.010	<0.010	BDL	No	0.01
Dissolved Cadmium (Cd)	<0.0000050	0.0000050	0.0000429	0.000038	12%	No	0.000005
Dissolved Chromium (Cr)	<0.00010	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Cobalt (Co)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Copper (Cu)	<0.000050	0.000050	0.000755	0.000718	5%	No	0.00005
Dissolved Iron (Fe)	<0.0010	0.0010	0.0033	0.0029	13%	No	0.001
Dissolved Lead (Pb)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Lithium (Li)	<0.00050	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Manganese (Mn)	<0.000050	0.000050	0.00143	0.00152	6%	No	0.00005
Dissolved Molybdenum (Mo)	<0.000050	0.000050	0.000108	0.000118	9%	No	0.00005
Dissolved Nickel (Ni)	<0.000020	0.000020	0.000073	0.000041	56%	No	0.00002
Dissolved Selenium (Se)	<0.000040	0.000040	0.000075	0.000054	33%	Yes	0.00004
Dissolved Silicon (Si)	<0.050	0.050	1.49	1.46	2%	No	0.05
Dissolved Silver (Ag)	<0.0000050	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	<0.000050	0.000050	0.0156	0.0154	1%	No	0.00005
Dissolved Thallium (Tl)	<0.0000020	0.0000020	<0.0000020	<0.0000020	BDL	No	0.000002
Dissolved Tin (Sn)	<0.00020	0.00020	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	<0.0000020	0.0000020	0.0000089	0.0000078	13%	No	0.000002
Dissolved Vanadium (V)	<0.00020	0.00020	0.00024	0.00024	0%	Yes	0.0002
Dissolved Zinc (Zn)	<0.00010	0.00010	0.0131	0.013	1%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	<0.050	0.050	10.4	10.1	3%	No	0.05
Dissolved Magnesium (Mg)	<0.050	0.050	0.766	0.756	1%	No	0.05
Dissolved Potassium (K)	<0.050	0.050	0.068	0.065	5%	Yes	0.05
Dissolved Sodium (Na)	<0.050	0.050	0.715	0.699	2%	No	0.05
Dissolved Sulphur (S)	<3.0	3.0	<3.0	<3.0	BDL	No	3

Highlight cells indicate presence of analyte in blank sample

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Sampling Date	DUPLICATES									
	2018/08/17 12:20	2018/08/17 12:20	RPD	Within 2x DL?	RDL	03/10/2018	03/10/2018	RPD	Within 2x DL?	RDL
	HEN-10	HEN-10D				HEN-10	HEN-10 D			
ANIONS										
Silica	2.87	2.96	3%	No	0.5	3.17	3.1	2%	No	0.5
Calculated Parameters										
Filter and HNO3 Preservation	LAB	LAB	BDL	No		LAB	LAB	BDL	No	
Nitrate (N)	0.0021	0.0022	5%	Yes	0.002	<0.0020	<0.0020	BDL	No	0.002
Anions										
Dissolved Sulphate (SO4)	4.8	4.9	2%	No	1	7.4	5.9	23%	No	1
MISCELLANEOUS										
Chlorophyll a			BDL	No				BDL	No	
Nutrients										
Dissolved Phosphorus (P)	<0.0020	<0.0020	BDL	No	0.002	<0.0020	<0.0020	BDL	No	0.002
Total Ammonia (N)	<0.020	0.022	BDL	Yes	0.02	<0.020	<0.020	BDL	No	0.02
Nitrate plus Nitrite (N)	0.0021	0.0022	5%	Yes	0.002	<0.0020	<0.0020	BDL	No	0.002
Nitrite (N)	<0.0020	<0.0020	BDL	No	0.002	<0.0020	<0.0020	BDL	No	0.002
Total Phosphorus (P)	<0.0020	<0.0020	BDL	No	0.002	<0.0020	<0.0020	BDL	No	0.002
Physical Properties										
Conductivity	62.8	64.1	2%	No	2	58.1	58.1	0%	No	2
pH	7.24	7.33	1%	No		7.3	7.3	0%	No	
Physical Properties										
Total Suspended Solids	<4.0	<4.0	BDL	No	4	<4.0	<4.0	BDL	No	4
Turbidity	0.2	0.17	16%	Yes	0.1	0.22	0.26	17%	No	0.1
Calculated Parameters										
Total Hardness (CaCO3)	25.8	26.1	1%	No	0.5	25	24.9	0%	No	0.5
Total Metals by ICPMS										
Total Aluminum (Al)	0.0162	0.0158	2%	No	0.0005	0.0173	0.0196	12%	No	0.0005
Total Antimony (Sb)	0.000053	0.000047	12%	No	0.00002	<0.000020	0.000032	BDL	Yes	0.00002
Total Arsenic (As)	0.000215	0.000207	4%	No	0.00002	0.000177	0.000191	8%	No	0.00002
Total Barium (Ba)	0.00379	0.00392	3%	No	0.00002	0.00353	0.00759	73%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	<0.010	<0.010	BDL	No	0.01	<0.010	<0.010	BDL	No	0.01
Total Cadmium (Cd)	0.0000214	0.0000214	0%	No	0.000005	0.0000197	0.0000164	18%	No	0.000005
Total Chromium (Cr)	0.00011	<0.00010	BDL	Yes	0.0001	0.0001	0.00011	10%	Yes	0.0001
Total Cobalt (Co)	0.0000072	0.0000059	20%	Yes	0.000005	0.0000083	0.0000119	36%	Yes	0.000005
Total Copper (Cu)	0.00059	0.000583	1%	No	0.00005	0.000577	0.000695	19%	No	0.00005
Total Iron (Fe)	0.0078	0.0079	1%	No	0.001	0.0075	0.0131	54%	No	0.001
Total Lead (Pb)	0.0000717	0.000175	84%	No	0.000005	0.0000203	0.000118	141%	No	0.000005
Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Manganese (Mn)	0.00174	0.00171	2%	No	0.00005	0.00132	0.0014	6%	No	0.00005
Total Molybdenum (Mo)	0.000124	0.000148	18%	No	0.00005	0.000117	0.000144	21%	No	0.00005
Total Nickel (Ni)	0.000041	0.000034	19%	Yes	0.00002	0.000041	0.000072	55%	No	0.00002
Total Selenium (Se)	0.000044	0.000045	2%	Yes	0.00004	0.000047	<0.000040	BDL	Yes	0.00004
Total Silicon (Si)	1.29	1.3	1%	No	0.05	1.26	1.3	3%	No	0.05
Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Total Strontium (Sr)	0.0154	0.0155	1%	No	0.00005	0.0137	0.0137	0%	No	0.00005
Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	0.0000106	0.0000104	2%	No	0.000002	0.0000106	0.0000097	9%	No	0.000002
Total Vanadium (V)	0.00034	0.00032	6%	Yes	0.0002	0.00029	0.00028	4%	Yes	0.0002
Total Zinc (Zn)	0.00633	0.00652	3%	No	0.0001	0.00536	0.00592	10%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	9.07	9.2	1%	No	0.05	8.82	8.72	1%	No	0.05
Total Magnesium (Mg)	0.773	0.77	0%	No	0.05	0.729	0.749	3%	No	0.05
Total Potassium (K)	0.062	0.063	2%	Yes	0.05	0.063	0.065	3%	Yes	0.05
Total Sodium (Na)	0.659	0.664	1%	No	0.05	0.653	0.669	2%	No	0.05
Total Sulphur (S)	<3.0	<3.0	BDL	No	3	<3.0	<3.0	BDL	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	27.4	28	2%	No	0.5	26.7	26.7	0%	No	0.5
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	0.0145	0.0143	1%	No	0.0005	0.0158	0.0157	1%	No	0.0005
Dissolved Antimony (Sb)	0.000029	0.000029	0%	Yes	0.00002	0.000021	0.000026	21%	Yes	0.00002
Dissolved Arsenic (As)	0.000203	0.0002	1%	No	0.00002	0.000187	0.000193	3%	No	0.00002
Dissolved Barium (Ba)	0.00394	0.00392	1%	No	0.00002	0.00371	0.00419	12%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	<0.010	<0.010	BDL	No	0.01
Dissolved Cadmium (Cd)	0.0000163	0.0000179	9%	No	0.000005	0.0000149	0.000019	24%	No	0.000005
Dissolved Chromium (Cr)	0.00011	<0.00010	BDL	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Cobalt (Co)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	0.0000058	BDL	Yes	0.000005
Dissolved Copper (Cu)	0.000518	0.000445	15%	No	0.00005	0.000813	0.000691	16%	No	0.00005
Dissolved Iron (Fe)	0.0021	0.0024	13%	No	0.001	0.0028	0.0027	4%	No	0.001
Dissolved Lead (Pb)	0.0000212	0.000033	44%	No	0.000005	0.0000206	0.0000135	42%	No	0.000005
Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Manganese (Mn)	<0.000050	<0.000050	BDL	No	0.00005	0.000237	0.000255	7%	No	0.00005
Dissolved Molybdenum (Mo)	0.000139	0.000127	9%	No	0.00005	0.000146	0.000188	25%	No	0.00005
Dissolved Nickel (Ni)	0.000034	0.000035	3%	Yes	0.00002	0.000053	0.000079	39%	No	0.00002
Dissolved Selenium (Se)	<0.000040	0.000046	BDL	Yes	0.00004	0.000052	0.000049	6%	Yes	0.00004
Dissolved Silicon (Si)	1.15	1.2	4%	No	0.05	1.33	1.33	0%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.0143	0.0147	3%	No	0.00005	0.014	0.0138	1%	No	0.00005
Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000106	0.0000113	6%	No	0.000002	0.0000103	0.0000093	10%	No	0.000002
Dissolved Vanadium (V)	0.00033	0.00033	0%	Yes	0.0002	0.00027	0.00027	0%	Yes	0.0002
Dissolved Zinc (Zn)	0.0056	0.00598	7%	No	0.0001	0.00531	0.00569	7%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	9.7	9.91	2%	No	0.05	9.49	9.46	0%	No	0.05
Dissolved Magnesium (Mg)	0.78	0.795	2%	No	0.05	0.74	0.754	2%	No	0.05
Dissolved Potassium (K)	0.063	0.067	6%	Yes	0.05	0.064	0.065	2%	Yes	0.05
Dissolved Sodium (Na)	0.668	0.682	2%	No	0.05	0.658	0.658	0%	No	0.05
Dissolved Sulphur (S)	<3.0	<3.0	BDL	No	3	<3.0	<3.0	BDL	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Blanks							
Sample ID	DC FB	RDL	DC FB	RDL	DC FB	RDL	MP-EFF DC MB	RDL
Sampling Date	25/04/2018		30/04/2018		11/07/2018		10/10/2018	
Calculated Parameters								
Total Hardness (CaCO3)	<0.50	0.50	28.6	0.50	<0.50	0.50	<0.50	0.50
Total Metals by ICPMS								
Total Aluminum (Al)	0.00066	0.00050	0.0435	0.00050	0.00100	0.00050	0.00094	0.00050
Total Antimony (Sb)	<0.000020	0.000020	0.000061	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Arsenic (As)	<0.000020	0.000020	0.000101	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Barium (Ba)	<0.000020	0.000020	0.0113	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Beryllium (Be)	<0.000010	0.000010	<0.000010	0.000010	<0.000010	0.000010	<0.000010	0.000010
Total Bismuth (Bi)	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	0.000088	0.000050
Total Boron (B)	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010
Total Cadmium (Cd)	<0.000050	0.000050	0.0000868	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Chromium (Cr)	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010
Total Cobalt (Co)	<0.000050	0.000050	0.0000142	0.000050	0.0000133	0.000050	<0.000050	0.000050
Total Copper (Cu)	0.000132	0.000050	0.00205	0.000050	0.000063	0.000050	<0.000050	0.000050
Total Iron (Fe)	<0.0010	0.0010	0.0135	0.0010	<0.0010	0.0010	<0.0010	0.0010
Total Lead (Pb)	0.0000211	0.000050	0.000308	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Lithium (Li)	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050
Total Manganese (Mn)	<0.000050	0.000050	0.00156	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Molybdenum (Mo)	<0.000050	0.000050	0.000250	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Nickel (Ni)	<0.000020	0.000020	0.000050	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Selenium (Se)	<0.000040	0.000040	0.000075	0.000040	<0.000040	0.000040	<0.000040	0.000040
Total Silicon (Si)	<0.050	0.050	1.22	0.050	<0.050	0.050	<0.050	0.050
Total Silver (Ag)	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Strontium (Sr)	<0.000050	0.000050	0.0259	0.000050	<0.000050	0.000050	<0.000050	0.000050
Total Thallium (Tl)	<0.000020	0.000020	<0.000020	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Tin (Sn)	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020
Total Titanium (Ti)	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050
Total Uranium (U)	<0.000020	0.000020	0.0000154	0.000020	<0.000020	0.000020	<0.000020	0.000020
Total Vanadium (V)	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020
Total Zinc (Zn)	0.00035	0.00010	0.0320	0.00010	0.00020	0.00010	0.00016	0.00010
Total Zirconium (Zr)	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010
Total Calcium (Ca)	<0.050	0.050	10.2	0.050	<0.050	0.050	<0.050	0.050
Total Magnesium (Mg)	<0.050	0.050	0.757	0.050	<0.050	0.050	<0.050	0.050
Total Potassium (K)	<0.050	0.050	0.115	0.050	<0.050	0.050	<0.050	0.050
Total Sodium (Na)	<0.050	0.050	0.902	0.050	<0.050	0.050	<0.050	0.050
Total Sulphur (S)	<3.0	3.0	4.9	3.0	<3.0	3.0	<3.0	3.0
Calculated Parameters								
Dissolved Hardness (CaCO3)	<0.50	0.50	29.0	0.50	<0.50	0.50	<0.50	0.50
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	<0.00050	0.00050	0.0370	0.00050	<0.00050	0.00050	0.00171	0.00050
Dissolved Antimony (Sb)	<0.000020	0.000020	0.000052	0.000020	<0.000020	0.000020	<0.000020	0.000020
Dissolved Arsenic (As)	<0.000020	0.000020	0.000095	0.000020	<0.000020	0.000020	0.000022	0.000020
Dissolved Barium (Ba)	<0.000020	0.000020	0.0118	0.000020	<0.000020	0.000020	0.000751	0.000020
Dissolved Beryllium (Be)	<0.000010	0.000010	<0.000010	0.000010	<0.000010	0.000010	<0.000010	0.000010
Dissolved Bismuth (Bi)	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	0.0000128	0.000050
Dissolved Boron (B)	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010
Dissolved Cadmium (Cd)	<0.000050	0.000050	0.0000902	0.000050	<0.000050	0.000050	<0.000050	0.000050
Dissolved Chromium (Cr)	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	0.00016	0.00010
Dissolved Cobalt (Co)	<0.000050	0.000050	0.0000135	0.000050	<0.000050	0.000050	<0.000050	0.000050
Dissolved Copper (Cu)	<0.000050	0.000050	0.00186	0.000050	<0.000050	0.000050	0.000571	0.000050
Dissolved Iron (Fe)	<0.0010	0.0010	0.0051	0.0010	<0.0010	0.0010	0.0016	0.0010
Dissolved Lead (Pb)	<0.000050	0.000050	0.000165	0.000050	<0.000050	0.000050	0.0000658	0.000050
Dissolved Lithium (Li)	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050
Dissolved Manganese (Mn)	<0.000050	0.000050	0.00112	0.000050	<0.000050	0.000050	0.000117	0.000050
Dissolved Molybdenum (Mo)	<0.000050	0.000050	0.000275	0.000050	<0.000050	0.000050	<0.000050	0.000050
Dissolved Nickel (Ni)	<0.000020	0.000020	0.000087	0.000020	<0.000020	0.000020	0.000064	0.000020
Dissolved Selenium (Se)	<0.000040	0.000040	0.000069	0.000040	<0.000040	0.000040	<0.000040	0.000040
Dissolved Silicon (Si)	<0.050	0.050	1.13	0.050	<0.050	0.050	<0.050	0.050
Dissolved Silver (Ag)	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050
Dissolved Strontium (Sr)	<0.000050	0.000050	0.0256	0.000050	<0.000050	0.000050	0.000153	0.000050
Dissolved Thallium (Tl)	<0.000020	0.000020	<0.000020	0.000020	<0.000020	0.000020	<0.000020	0.000020
Dissolved Tin (Sn)	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020
Dissolved Titanium (Ti)	<0.00050	0.00050	<0.00050	0.00050	0.00063	0.00050	<0.00050	0.00050
Dissolved Uranium (U)	<0.000020	0.000020	0.0000162	0.000020	<0.000020	0.000020	<0.000020	0.000020
Dissolved Vanadium (V)	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020
Dissolved Zinc (Zn)	<0.00010	0.00010	0.0327	0.00010	<0.00010	0.00010	0.00135	0.00010
Dissolved Zirconium (Zr)	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010	<0.00010	0.00010
Dissolved Calcium (Ca)	<0.050	0.050	10.4	0.050	<0.050	0.050	0.050	0.050
Dissolved Magnesium (Mg)	<0.050	0.050	0.721	0.050	<0.050	0.050	<0.050	0.050
Dissolved Potassium (K)	<0.050	0.050	0.121	0.050	<0.050	0.050	<0.050	0.050
Dissolved Sodium (Na)	<0.050	0.050	0.947	0.050	<0.050	0.050	0.056	0.050
Dissolved Sulphur (S)	<3.0	3.0	4.8	3.0	<3.0	3.0	<3.0	3.0

Highlight cells indicate presence of analyte in blank sample

Duplicates											
Sample ID	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL?	RDL	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	Sample ID
Sampling Date	18/02/2018	18/02/2018				24/02/2018	24/02/2018				Sampling Date
Calculated Parameters											Calculated Parameters
Total Hardness (CaCO3)					0.50	317	312			0.50	Total Hardness (CaCO3)
Total Metals by ICPMS											Total Metals by ICPMS
Total Aluminum (Al)	0.0757	0.168	76%	No	0.0005	0.0655	0.0619	6%	No	0.0005	Total Aluminum (Al)
Total Antimony (Sb)	0.000217	0.000226	4%	No	0.00002	0.000248	0.000241	3%	No	0.00002	Total Antimony (Sb)
Total Arsenic (As)	0.000087	0.000184	72%	No	0.00002	0.000089	0.000082	8%	No	0.00002	Total Arsenic (As)
Total Barium (Ba)	0.0197	0.0248	23%	No	0.00002	0.0187	0.019	2%	No	0.00002	Total Barium (Ba)
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Total Beryllium (Be)
Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)
Total Boron (B)	0.021	0.021	0%	No	0.01	0.022	0.021	5%	No	0.01	Total Boron (B)
Total Cadmium (Cd)	0.000404	0.000599	39%	No	0.000005	0.000273	0.000272	0%	No	0.000005	Total Cadmium (Cd)
Total Chromium (Cr)	<0.00010	0.00012	BDL	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Chromium (Cr)
Total Cobalt (Co)	0.000106	0.000228	73%	No	0.000005	0.000106	0.000108	2%	No	0.000005	Total Cobalt (Co)
Total Copper (Cu)	0.00572	0.0153	91%	No	0.00005	0.00496	0.0051	3%	No	0.00005	Total Copper (Cu)
Total Iron (Fe)	0.0512	0.148	97%	No	0.001	0.0384	0.037	4%	No	0.001	Total Iron (Fe)
Total Lead (Pb)	0.000931	0.00283	101%	No	0.000005	0.000559	0.000546	2%	No	0.000005	Total Lead (Pb)
Total Lithium (Li)	0.00314	0.00322	3%	No	0.0005	0.00248	0.00246	1%	No	0.0005	Total Lithium (Li)
Total Manganese (Mn)	0.0204	0.0446	74%	No	0.00005	0.0236	0.0236	0%	No	0.00005	Total Manganese (Mn)
Total Molybdenum (Mo)	0.000486	0.000484	0%	No	0.00005	0.000531	0.000512	4%	No	0.00005	Total Molybdenum (Mo)
Total Nickel (Ni)	0.000135	0.000322	82%	No	0.00002	0.000221	0.000245	10%	No	0.00002	Total Nickel (Ni)
Total Selenium (Se)	0.000417	0.000458	9%	No	0.00004	0.00042	0.000411	2%	No	0.00004	Total Selenium (Se)
Total Silicon (Si)	2.56	2.71	6%	No	0.05	2.78	2.75	1%	No	0.05	Total Silicon (Si)
Total Silver (Ag)	<0.0000050	0.000009	BDL	Yes	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Silver (Ag)
Total Strontium (Sr)	0.53	0.568	7%	No	0.00005	0.442	0.439	1%	No	0.00005	Total Strontium (Sr)
Total Thallium (Tl)	0.00001	0.0000101	1%	No	0.000002	0.0000061	0.0000058	5%	No	0.000002	Total Thallium (Tl)
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Tin (Sn)
Total Titanium (Ti)	<0.00050	0.00057	BDL	Yes	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Titanium (Ti)
Total Uranium (U)	0.0000102	0.0000153	40%	No	0.000002	0.0000105	0.0000115	9%	No	0.000002	Total Uranium (U)
Total Vanadium (V)	0.00093	0.00135	37%	No	0.0002	0.00116	0.00122	5%	No	0.0002	Total Vanadium (V)
Total Zinc (Zn)	0.0865	0.167	64%	No	0.0001	0.0653	0.0645	1%	No	0.0001	Total Zinc (Zn)
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Zirconium (Zr)
Total Calcium (Ca)	146	154	5%	No	0.05	114	112	2%	No	0.05	Total Calcium (Ca)
Total Magnesium (Mg)	4.56	5.05	10%	No	0.05	7.76	7.67	1%	No	0.05	Total Magnesium (Mg)
Total Potassium (K)	1.12	1.17	4%	No	0.05	1.02	1.02	0%	No	0.05	Total Potassium (K)
Total Sodium (Na)	7.28	7.47	3%	No	0.05	7.67	7.8	2%	No	0.05	Total Sodium (Na)
Total Sulphur (S)	118	125	6%	No	3	98.1	98.3	0%	No	3	Total Sulphur (S)
Calculated Parameters											Calculated Parameters
Dissolved Hardness (CaCO3)			BDL	Yes	0.5	288	301	4%	No	0.5	Dissolved Hardness (CaCO3)
Dissolved Metals by ICPMS											Dissolved Metals by ICPMS
Dissolved Aluminum (Al)	0.0395	0.0453	14%	No	0.0005	0.0188	0.0194	3%	No	0.0005	Dissolved Aluminum (Al)
Dissolved Antimony (Sb)	0.00025	0.00022	13%	No	0.00002	0.000239	0.000237	1%	No	0.00002	Dissolved Antimony (Sb)
Dissolved Arsenic (As)	0.00007	0.000081	15%	No	0.00002	0.000043	0.000045	5%	No	0.00002	Dissolved Arsenic (As)
Dissolved Barium (Ba)	0.0205	0.0185	10%	No	0.00002	0.0173	0.0175	1%	No	0.00002	Dissolved Barium (Ba)
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)
Dissolved Boron (B)	0.023	0.019	19%	Yes	0.01	0.021	0.022	5%	No	0.01	Dissolved Boron (B)
Dissolved Cadmium (Cd)	0.000429	0.000447	4%	No	0.000005	0.000241	0.000233	3%	No	0.000005	Dissolved Cadmium (Cd)
Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Chromium (Cr)
Dissolved Cobalt (Co)	0.0000695	0.0000805	15%	No	0.000005	0.0000576	0.0000606	5%	No	0.000005	Dissolved Cobalt (Co)
Dissolved Copper (Cu)	0.00141	0.00108	27%	No	0.00005	0.00129	0.00119	8%	No	0.00005	Dissolved Copper (Cu)
Dissolved Iron (Fe)	<0.0010	<0.0010	BDL	No	0.001	<0.0010	0.0014	BDL	Yes	0.001	Dissolved Iron (Fe)
Dissolved Lead (Pb)	0.0000224	0.0000299	29%	No	0.000005	0.0000268	0.0000518	64%	No	0.000005	Dissolved Lead (Pb)
Dissolved Lithium (Li)	0.00352	0.0029	19%	No	0.0005	0.00242	0.00252	4%	No	0.0005	Dissolved Lithium (Li)
Dissolved Manganese (Mn)	0.0103	0.0122	17%	No	0.00005	0.00944	0.00923	2%	No	0.00005	Dissolved Manganese (Mn)
Dissolved Molybdenum (Mo)	0.000537	0.000474	12%	No	0.00005	0.0005	0.000494	1%	No	0.00005	Dissolved Molybdenum (Mo)
Dissolved Nickel (Ni)	0.000088	0.000144	48%	No	0.00002	0.000162	0.000166	2%	No	0.00002	Dissolved Nickel (Ni)
Dissolved Selenium (Se)	0.000361	0.000328	10%	No	0.00004	0.000373	0.000375	1%	No	0.00004	Dissolved Selenium (Se)
Dissolved Silicon (Si)	2.51	2.42	4%	No	0.05	2.63	2.64	0%	No	0.05	Dissolved Silicon (Si)
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)
Dissolved Strontium (Sr)	0.569	0.559	2%	No	0.00005	0.436	0.424	3%	No	0.00005	Dissolved Strontium (Sr)
Dissolved Thallium (Tl)	0.0000119	0.0000111	7%	No	0.000002	0.0000071	0.0000071	0%	No	0.000002	Dissolved Thallium (Tl)
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Tin (Sn)
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Titanium (Ti)
Dissolved Uranium (U)	0.0000124	0.0000119	4%	No	0.000002	0.00001	0.0000088	13%	No	0.000002	Dissolved Uranium (U)
Dissolved Vanadium (V)	0.00078	0.00075	4%	No	0.0002	0.00092	0.00088	4%	No	0.0002	Dissolved Vanadium (V)
Dissolved Zinc (Zn)	0.0677	0.0698	3%	No	0.0001	0.0423	0.0414	2%	No	0.0001	Dissolved Zinc (Zn)
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)
Dissolved Calcium (Ca)	145	143	1%	No	0.05	103	109	6%	No	0.05	Dissolved Calcium (Ca)
Dissolved Magnesium (Mg)	4.39	4.32	2%	No	0.05	7.63	7.29	5%	No	0.05	Dissolved Magnesium (Mg)
Dissolved Potassium (K)	1.16	1.17	1%	No	0.05	1.02	0.984	4%	No	0.05	Dissolved Potassium (K)
Dissolved Sodium (Na)	6.59	6.8	3%	No	0.05	7.53	7.2	4%	No	0.05	Dissolved Sodium (Na)
Dissolved Sulphur (S)	114	112	2%	No	3	95.4	91.2	5%	No	3	Dissolved Sulphur (S)

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Duplicates												
MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	MC-TP4 WC	MC-TP4 WC D	RPD	Within 2x DL	RDL	Sample ID	MP-EFF DC	MP-EFF DC D
06/03/2018	06/03/2018				07/03/2018	07/03/2018				Sampling Date	07/03/2018	07/03/2018
										Calculated Parameters		
347	341			0.50	84.9	84.9			0.50	Total Hardness (CaCO3)	367	363
										Total Metals by ICPMS		
0.125	0.123	2%	No	0.0005	0.0234	0.0231	1%	No	0.0005	Total Aluminum (Al)	0.332	0.314
0.000264	0.000249	6%	No	0.00002	0.000121	0.000125	3%	No	0.00002	Total Antimony (Sb)	0.000275	0.000265
0.000127	0.000109	15%	No	0.00002	0.000112	0.000115	3%	No	0.00002	Total Arsenic (As)	0.000191	0.000169
0.0157	0.015	5%	No	0.00002	0.0161	0.0162	1%	No	0.00002	Total Barium (Ba)	0.0177	0.0175
<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010
<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050
0.022	0.022	0%	No	0.01	<0.010	<0.010	BDL	No	0.01	Total Boron (B)	0.027	0.027
0.000227	0.000221	3%	No	0.000005	0.000303	0.000308	2%	No	0.000005	Total Cadmium (Cd)	0.000388	0.000373
<0.00010	0.0001	BDL	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Chromium (Cr)	0.00015	0.00013
0.0000899	0.0000913	2%	No	0.000005	0.0000398	0.0000405	2%	No	0.000005	Total Cobalt (Co)	0.000293	0.00028
0.00495	0.00495	0%	No	0.00005	0.00283	0.00288	2%	No	0.00005	Total Copper (Cu)	0.0154	0.0131
0.0386	0.0366	5%	No	0.001	0.0089	0.0092	3%	No	0.001	Total Iron (Fe)	0.113	0.0826
0.000667	0.000658	1%	No	0.000005	0.000276	0.000286	4%	No	0.000005	Total Lead (Pb)	0.00258	0.00196
0.00244	0.00243	0%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Lithium (Li)	0.00285	0.00281
0.0262	0.0257	2%	No	0.00005	0.00826	0.00818	1%	No	0.00005	Total Manganese (Mn)	0.0886	0.0847
0.000574	0.000568	1%	No	0.00005	0.000451	0.000415	8%	No	0.00005	Total Molybdenum (Mo)	0.000927	0.000962
0.000251	0.000261	4%	No	0.00002	0.000219	0.000217	1%	No	0.00002	Total Nickel (Ni)	0.000338	0.000315
0.000476	0.000473	1%	No	0.00004	0.000186	0.000195	5%	No	0.00004	Total Selenium (Se)	0.000573	0.000538
2.14	2.21	3%	No	0.05	1.42	1.36	4%	No	0.05	Total Silicon (Si)	2.69	2.75
0.0000054	<0.0000050	BDL	Yes	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Silver (Ag)	0.0000148	0.0000135
0.437	0.431	1%	No	0.00005	0.0813	0.0822	1%	No	0.00005	Total Strontium (Sr)	0.475	0.478
0.0000077	0.0000072	7%	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002	Total Thallium (Tl)	0.00001	0.0000094
<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020
<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050
0.0000236	0.0000224	5%	No	0.000002	0.0000142	0.0000142	0%	No	0.000002	Total Uranium (U)	0.0000148	0.0000155
0.00079	0.00074	7%	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Vanadium (V)	0.00098	0.00098
0.0569	0.0571	0%	No	0.0001	0.115	0.115	0%	No	0.0001	Total Zinc (Zn)	0.107	0.101
0.00013	<0.00010	BDL	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010
123	120	2%	No	0.05	29.9	29.9	0%	No	0.05	Total Calcium (Ca)	129	127
9.88	9.82	1%	No	0.05	2.47	2.49	1%	No	0.05	Total Magnesium (Mg)	10.9	11.1
1.06	1.06	0%	No	0.05	0.278	0.279	0%	No	0.05	Total Potassium (K)	1.1	1.09
7.65	7.5	2%	No	0.05	1.84	1.85	1%	No	0.05	Total Sodium (Na)	7.92	8.07
111	112	1%	No	3	21.1	22.1	5%	No	3	Total Sulphur (S)	118	117
		BDL	No				BDL	No		Calculated Parameters		
334	327	2%	No	0.5	83.7	84.5	1%	No	0.5	Dissolved Hardness (CaCO3)	358	358
		BDL	No				BDL	No		Dissolved Metals by ICPMS		
0.0704	0.0715	2%	No	0.0005	0.02	0.0202	1%	No	0.0005	Dissolved Aluminum (Al)	0.0602	0.0608
0.000236	0.000227	4%	No	0.00002	0.00011	0.000108	2%	No	0.00002	Dissolved Antimony (Sb)	0.000246	0.000234
0.000097	0.00009	7%	No	0.00002	0.0001	0.000101	1%	No	0.00002	Dissolved Arsenic (As)	0.000073	0.000069
0.0131	0.013	1%	No	0.00002	0.0154	0.0157	2%	No	0.00002	Dissolved Barium (Ba)	0.0126	0.0124
<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010
<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050
0.021	0.02	5%	No	0.01	<0.010	<0.010	BDL	No	0.01	Dissolved Boron (B)	0.026	0.026
0.00015	0.000149	1%	No	0.000005	0.000301	0.000309	3%	No	0.000005	Dissolved Cadmium (Cd)	0.00021	0.000204
0.0001	0.00013	26%	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010
0.0000323	0.0000285	13%	No	0.000005	0.0000369	0.0000449	20%	No	0.000005	Dissolved Cobalt (Co)	0.0000339	0.0000344
0.00155	0.00146	6%	No	0.00005	0.00257	0.00257	0%	No	0.00005	Dissolved Copper (Cu)	0.000776	0.000795
0.0016	<0.0010	BDL	Yes	0.001	0.0023	0.0027	16%	No	0.001	Dissolved Iron (Fe)	<0.0010	<0.0010
0.0000257	0.0000212	19%	No	0.000005	0.000129	0.000159	21%	No	0.000005	Dissolved Lead (Pb)	0.000015	0.000015
0.00237	0.00232	2%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Lithium (Li)	0.00268	0.00261
0.00861	0.00835	3%	No	0.00005	0.00793	0.008	1%	No	0.00005	Dissolved Manganese (Mn)	0.00732	0.00745
0.000567	0.000565	0%	No	0.00005	0.000403	0.000454	12%	No	0.00005	Dissolved Molybdenum (Mo)	0.00056	0.000562
0.000298	0.000277	7%	No	0.00002	0.000238	0.000248	4%	No	0.00002	Dissolved Nickel (Ni)	0.000099	0.000091
0.000437	0.000439	0%	No	0.00004	0.000181	0.000187	3%	No	0.00004	Dissolved Selenium (Se)	0.000444	0.000469
2.03	1.93	5%	No	0.05	1.4	1.48	6%	No	0.05	Dissolved Silicon (Si)	2.58	2.54
<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050
0.429	0.432	1%	No	0.00005	0.0818	0.0816	0%	No	0.00005	Dissolved Strontium (Sr)	0.464	0.469
0.0000077	0.0000071	8%	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002	Dissolved Thallium (Tl)	0.0000077	0.0000072
<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020
<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050
0.0000217	0.0000221	2%	No	0.000002	0.0000124	0.0000121	2%	No	0.000002	Dissolved Uranium (U)	0.0000103	0.0000102
0.00073	0.00071	3%	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Vanadium (V)	0.00071	0.00074
0.0262	0.0256	2%	No	0.0001	0.114	0.114	0%	No	0.0001	Dissolved Zinc (Zn)	0.0227	0.0224
<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010
118	115	3%	No	0.05	29.4	29.6	1%	No	0.05	Dissolved Calcium (Ca)	125	125
9.53	9.57	0%	No	0.05	2.52	2.58	2%	No	0.05	Dissolved Magnesium (Mg)	10.7	10.8
1.03	1.03	0%	No	0.05	0.284	0.283	0%	No	0.05	Dissolved Potassium (K)	1.08	1.11
7.37	7.35	0%	No	0.05	1.91	1.9	1%	No	0.05	Dissolved Sodium (Na)	7.99	8.03
110	107	3%	No	3	22	22.6	3%	No	3	Dissolved Sulphur (S)	116	116

ifference greater than 10%

ifference greater than 20%

/ detection limit

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Duplicates											
RPD	Within 2x DL	RDL	MC-TP4 DC 14/03/2018	MC-TP4 DC D 14/03/2018	RPD	Within 2x DL	RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD
								Sampling Date	21/03/2018	21/03/2018	
								Calculated Parameters			
0.010958904		0.50	96	96.7	0.007265179		0.50	Total Hardness (CaCO3)	97.1	95.9	0.012435233
BDL					BDL			Total Metals by ICPMS			BDL
6%	No	0.0005	0.0225	0.0223	1%	No	0.0005	Total Aluminum (Al)	0.0189	0.0183	3%
4%	No	0.00002	0.000107	0.000096	11%	No	0.00002	Total Antimony (Sb)	0.000132	0.000136	3%
12%	No	0.00002	0.000118	0.000111	6%	No	0.00002	Total Arsenic (As)	0.000144	0.000131	9%
1%	No	0.00002	0.017	0.0169	1%	No	0.00002	Total Barium (Ba)	0.0166	0.0162	2%
BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL
BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL
0%	No	0.01	<0.010	<0.010	BDL	No	0.01	Total Boron (B)	<0.010	<0.010	BDL
4%	No	0.000005	0.00031	0.000317	2%	No	0.000005	Total Cadmium (Cd)	0.000332	0.000331	0%
14%	Yes	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL
5%	No	0.000005	0.0000432	0.000044	2%	No	0.000005	Total Cobalt (Co)	0.0000232	0.0000258	11%
16%	No	0.00005	0.00352	0.00356	1%	No	0.00005	Total Copper (Cu)	0.00206	0.00206	0%
31%	No	0.001	0.0062	0.006	3%	No	0.001	Total Iron (Fe)	0.0043	0.0046	7%
27%	No	0.000005	0.000252	0.000244	3%	No	0.000005	Total Lead (Pb)	0.000193	0.000195	1%
1%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Lithium (Li)	<0.00050	<0.00050	BDL
5%	No	0.00005	0.00708	0.00672	5%	No	0.00005	Total Manganese (Mn)	0.00348	0.00334	4%
4%	No	0.00005	0.000455	0.000448	2%	No	0.00005	Total Molybdenum (Mo)	0.000443	0.000436	2%
7%	No	0.00002	0.000212	0.000259	20%	No	0.00002	Total Nickel (Ni)	0.000239	0.000259	8%
6%	No	0.00004	0.000243	0.000242	0%	No	0.00004	Total Selenium (Se)	0.000221	0.000213	4%
2%	No	0.05	1.78	1.69	5%	No	0.05	Total Silicon (Si)	1.79	2.16	19%
9%	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL
1%	No	0.00005	0.083	0.0818	1%	No	0.00005	Total Strontium (Sr)	0.0874	0.0877	0%
6%	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002	Total Thallium (Tl)	<0.0000020	<0.0000020	BDL
BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL
BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL
5%	No	0.000002	0.0000128	0.0000124	3%	No	0.000002	Total Uranium (U)	0.0000194	0.0000194	0%
0%	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL
6%	No	0.0001	0.118	0.117	1%	No	0.0001	Total Zinc (Zn)	0.126	0.126	0%
BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL
2%	No	0.05	33.5	33.9	1%	No	0.05	Total Calcium (Ca)	34.1	33.5	2%
2%	No	0.05	3.02	2.92	3%	No	0.05	Total Magnesium (Mg)	2.91	2.97	2%
1%	No	0.05	0.298	0.299	0%	No	0.05	Total Potassium (K)	0.298	0.297	0%
2%	No	0.05	2.1	2.06	2%	No	0.05	Total Sodium (Na)	2.03	2.03	0%
1%	No	3	23.3	23.7	2%	No	3	Total Sulphur (S)	24.5	24.2	1%
BDL	No				BDL	No		Calculated Parameters			BDL
0%	No	0.5	96.7	97.8	1%	No	0.5	Dissolved Hardness (CaCO3)	102	102	0%
BDL	No				BDL	No		Dissolved Metals by ICPMS			BDL
1%	No	0.0005	0.0205	0.0219	7%	No	0.0005	Dissolved Aluminum (Al)	0.0166	0.0164	1%
5%	No	0.00002	0.00011	0.000105	5%	No	0.00002	Dissolved Antimony (Sb)	0.000126	0.000124	2%
6%	No	0.00002	0.000136	0.000124	9%	No	0.00002	Dissolved Arsenic (As)	0.000123	0.000129	5%
2%	No	0.00002	0.0173	0.0179	3%	No	0.00002	Dissolved Barium (Ba)	0.0162	0.0161	1%
BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL
BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL
0%	No	0.01	<0.010	<0.010	BDL	No	0.01	Dissolved Boron (B)	<0.010	<0.010	BDL
3%	No	0.000005	0.000325	0.00034	5%	No	0.000005	Dissolved Cadmium (Cd)	0.000323	0.000331	2%
BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL
1%	No	0.000005	0.0000422	0.0000459	8%	No	0.000005	Dissolved Cobalt (Co)	0.0000196	0.0000197	1%
2%	No	0.00005	0.00327	0.00343	5%	No	0.00005	Dissolved Copper (Cu)	0.00166	0.00169	2%
BDL	No	0.001	0.0018	0.0022	20%	Yes	0.001	Dissolved Iron (Fe)	0.0017	0.001	52%
0%	No	0.000005	0.000156	0.000158	1%	No	0.000005	Dissolved Lead (Pb)	0.0000782	0.0000834	6%
3%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL
2%	No	0.00005	0.0065	0.00681	5%	No	0.00005	Dissolved Manganese (Mn)	0.00249	0.00272	9%
0%	No	0.00005	0.000456	0.000484	6%	No	0.00005	Dissolved Molybdenum (Mo)	0.000434	0.00043	1%
8%	No	0.00002	0.00024	0.000243	1%	No	0.00002	Dissolved Nickel (Ni)	0.000241	0.000222	8%
5%	No	0.00004	0.000234	0.000239	2%	No	0.00004	Dissolved Selenium (Se)	0.000203	0.000184	10%
2%	No	0.05	1.77	1.81	2%	No	0.05	Dissolved Silicon (Si)	1.77	1.77	0%
BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL
1%	No	0.00005	0.0865	0.0897	4%	No	0.00005	Dissolved Strontium (Sr)	0.0861	0.0869	1%
7%	No	0.000002	0.0000021	<0.0000020	BDL	Yes	0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL
BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL
BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL
1%	No	0.000002	0.0000134	0.000013	3%	No	0.000002	Dissolved Uranium (U)	0.0000171	0.000017	1%
4%	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Vanadium (V)	0.0002	<0.00020	BDL
1%	No	0.0001	0.119	0.121	2%	No	0.0001	Dissolved Zinc (Zn)	0.12	0.12	0%
BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL
0%	No	0.05	33.8	34.3	1%	No	0.05	Dissolved Calcium (Ca)	35.7	35.9	1%
1%	No	0.05	2.97	2.95	1%	No	0.05	Dissolved Magnesium (Mg)	3.14	3.14	0%
3%	No	0.05	0.316	0.323	2%	No	0.05	Dissolved Potassium (K)	0.315	0.312	1%
0%	No	0.05	2.02	2.08	3%	No	0.05	Dissolved Sodium (Na)	2.19	2.21	1%
0%	No	3	23.6	25	6%	No	3	Dissolved Sulphur (S)	24.2	25.3	4%

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Duplicates											
Within 2x DL	RDL	MP-EFF DC 09/04/2018	MP-EFF DC D 09/04/2018	RPD	Within 2x DL	RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL
							Sampling Date	16/04/2018	16/04/2018		
							Calculated Parameters				
	0.50	269	274	0.018416206		0.50	Total Hardness (CaCO3)	55.3	57.2	0.033777778	
				BDL			Total Metals by ICPMS			BDL	
No	0.0005	0.279	0.286	2%	No	0.0005	Total Aluminum (Al)	0.0349	0.0355	2%	No
No	0.00002	0.00018	0.00018	0%	No	0.00002	Total Antimony (Sb)	0.000055	0.000064	15%	No
No	0.00002	0.000097	0.000111	13%	No	0.00002	Total Arsenic (As)	0.000091	0.00008	13%	No
No	0.00002	0.0132	0.0138	4%	No	0.00002	Total Barium (Ba)	0.0107	0.0111	4%	No
No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No
No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No
No	0.01	0.017	0.016	6%	Yes	0.01	Total Boron (B)	<0.010	<0.010	BDL	No
No	0.000005	0.000196	0.000203	4%	No	0.000005	Total Cadmium (Cd)	0.000221	0.000227	3%	No
No	0.0001	<0.00010	0.00011	BDL	Yes	0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL	No
No	0.000005	0.0000758	0.000079	4%	No	0.000005	Total Cobalt (Co)	0.000028	0.0000281	0%	No
No	0.00005	0.00582	0.00585	1%	No	0.00005	Total Copper (Cu)	0.00224	0.00235	5%	No
No	0.001	0.0687	0.066	4%	No	0.001	Total Iron (Fe)	0.0066	0.0066	0%	No
No	0.000005	0.0000914	0.000899	2%	No	0.000005	Total Lead (Pb)	0.0000827	0.000135	48%	No
No	0.0005	0.00195	0.00198	2%	No	0.0005	Total Lithium (Li)	<0.00050	<0.00050	BDL	No
No	0.00005	0.0147	0.0149	1%	No	0.00005	Total Manganese (Mn)	0.00449	0.00452	1%	No
No	0.00005	0.000354	0.000362	2%	No	0.00005	Total Molybdenum (Mo)	0.000302	0.000295	2%	No
No	0.00002	0.000139	0.000157	12%	No	0.00002	Total Nickel (Ni)	0.000132	0.000159	19%	No
No	0.00004	0.00044	0.000407	8%	No	0.00004	Total Selenium (Se)	0.000105	0.000133	24%	No
No	0.05	2.3	2.27	1%	No	0.05	Total Silicon (Si)	1.59	1.64	3%	No
No	0.000005	0.0000094	0.00001	6%	Yes	0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No
No	0.00005	0.31	0.313	1%	No	0.00005	Total Strontium (Sr)	0.0479	0.0482	1%	No
No	0.000002	0.0000075	0.0000058	26%	No	0.000002	Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No
No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No
No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No
No	0.000002	0.0000117	0.0000108	8%	No	0.000002	Total Uranium (U)	0.0000118	0.0000119	1%	No
No	0.0002	0.00046	0.00051	10%	No	0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL	No
No	0.0001	0.049	0.0495	1%	No	0.0001	Total Zinc (Zn)	0.0815	0.0825	1%	No
No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No
No	0.05	96.8	98.5	2%	No	0.05	Total Calcium (Ca)	20	20.7	3%	No
No	0.05	6.58	6.73	2%	No	0.05	Total Magnesium (Mg)	1.31	1.33	2%	No
No	0.05	0.784	0.787	0%	No	0.05	Total Potassium (K)	0.177	0.182	3%	No
No	0.05	5.48	5.39	2%	No	0.05	Total Sodium (Na)	1.32	1.33	1%	No
No	3	81.3	79.7	2%	No	3	Total Sulphur (S)	12.7	12.7	0%	No
No				BDL	No		Calculated Parameters			BDL	No
No	0.5	263	264	0%	No	0.5	Dissolved Hardness (CaCO3)	59.8	60.9	2%	No
No				BDL	No		Dissolved Metals by ICPMS			BDL	No
No	0.0005	0.0873	0.0903	3%	No	0.0005	Dissolved Aluminum (Al)	0.0326	0.0319	2%	No
No	0.00002	0.000178	0.00018	1%	No	0.00002	Dissolved Antimony (Sb)	0.000052	0.000058	11%	No
No	0.00002	0.000051	0.000061	18%	No	0.00002	Dissolved Arsenic (As)	0.000079	0.000077	3%	No
No	0.00002	0.0121	0.0119	2%	No	0.00002	Dissolved Barium (Ba)	0.0109	0.011	1%	No
No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No
No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No
No	0.01	0.018	0.018	0%	Yes	0.01	Dissolved Boron (B)	<0.010	<0.010	BDL	No
No	0.000005	0.000143	0.00014	2%	No	0.000005	Dissolved Cadmium (Cd)	0.000229	0.000217	5%	No
No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No
No	0.000005	0.0000241	0.0000336	33%	No	0.000005	Dissolved Cobalt (Co)	0.0000264	0.0000309	16%	No
No	0.00005	0.000951	0.00097	2%	No	0.00005	Dissolved Copper (Cu)	0.00203	0.00204	0%	No
Yes	0.001	0.001	<0.0010	BDL	Yes	0.001	Dissolved Iron (Fe)	0.0023	0.0029	23%	No
No	0.000005	0.0000352	0.0000564	46%	No	0.000005	Dissolved Lead (Pb)	0.0000457	0.0000451	1%	No
No	0.0005	0.00198	0.002	1%	No	0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No
No	0.00005	0.00522	0.00532	2%	No	0.00005	Dissolved Manganese (Mn)	0.00432	0.00422	2%	No
No	0.00005	0.00038	0.000383	1%	No	0.00005	Dissolved Molybdenum (Mo)	0.000312	0.000286	9%	No
No	0.00002	0.000087	0.00009	3%	No	0.00002	Dissolved Nickel (Ni)	0.000144	0.000175	19%	No
No	0.00004	0.000394	0.000407	3%	No	0.00004	Dissolved Selenium (Se)	0.000125	0.000106	16%	No
No	0.05	2.23	2.29	3%	No	0.05	Dissolved Silicon (Si)	1.61	1.65	2%	No
No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No
No	0.00005	0.303	0.307	1%	No	0.00005	Dissolved Strontium (Sr)	0.0488	0.0494	1%	No
No	0.000002	0.0000065	0.0000061	6%	No	0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No
No	0.0002	0.00021	<0.00020	BDL	Yes	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No
No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No
No	0.000002	0.0000071	0.0000077	8%	No	0.000002	Dissolved Uranium (U)	0.0000124	0.0000118	5%	No
Yes	0.0002	0.00038	0.00038	0%	Yes	0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No
No	0.0001	0.0217	0.0218	0%	No	0.0001	Dissolved Zinc (Zn)	0.0846	0.0836	1%	No
No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No
No	0.05	94.5	95	1%	No	0.05	Dissolved Calcium (Ca)	21.5	22	2%	No
No	0.05	6.5	6.52	0%	No	0.05	Dissolved Magnesium (Mg)	1.46	1.45	1%	No
No	0.05	0.78	0.791	1%	No	0.05	Dissolved Potassium (K)	0.199	0.193	3%	No
No	0.05	5.46	5.55	2%	No	0.05	Dissolved Sodium (Na)	1.46	1.4	4%	No
No	3	85.3	86.8	2%	No	3	Dissolved Sulphur (S)	12.9	13.1	2%	No

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

Duplicates						Duplicates						
RDL	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	MC-TP4 DC
	06/05/2018	06/05/2018						12/05/2018			12/05/2018	
						Sampling Date						
						Calculated Parameters						
0.50	23.7	23.7	0		0.50	Total Hardness (CaCO3)	21.7	21.3	0.018604651		0.50	25.3
			BDL			Total Metals by ICPMS			BDL			
0.0005	0.0707	0.0465	41%	No	0.0005	Total Aluminum (Al)	0.044	0.0435	1%	No	0.0005	0.0367
0.00002	0.000042	0.000043	2%	No	0.00002	Total Antimony (Sb)	0.000048	0.000055	14%	No	0.00002	0.00004
0.00002	0.000092	0.000099	7%	No	0.00002	Total Arsenic (As)	0.000071	0.000069	3%	No	0.00002	0.000093
0.00002	0.0081	0.00824	2%	No	0.00002	Total Barium (Ba)	0.0058	0.00586	1%	No	0.00002	0.0076
0.00001	<0.000010	<0.000010	BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010
0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050
0.01	<0.010	<0.010	BDL	No	0.01	Total Boron (B)	<0.010	<0.010	BDL	No	0.01	<0.010
0.000005	0.0000734	0.0000748	2%	No	0.000005	Total Cadmium (Cd)	0.000063	0.0000612	3%	No	0.000005	0.0000781
0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010
0.000005	0.0000151	0.0000119	24%	No	0.000005	Total Cobalt (Co)	0.0000108	0.0000109	1%	No	0.000005	0.0000121
0.00005	0.00289	0.00272	6%	No	0.00005	Total Copper (Cu)	0.00139	0.00139	0%	No	0.00005	0.00174
0.001	0.0114	0.0114	0%	No	0.001	Total Iron (Fe)	0.0088	0.009	2%	No	0.001	0.01
0.000005	0.000355	0.000335	6%	No	0.000005	Total Lead (Pb)	0.000119	0.0000725	49%	No	0.000005	0.00021
0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050
0.00005	0.00107	0.00101	6%	No	0.00005	Total Manganese (Mn)	0.000711	0.000737	4%	No	0.00005	0.00125
0.00005	0.000246	0.000227	8%	No	0.00005	Total Molybdenum (Mo)	0.000202	0.000209	3%	No	0.00005	0.000227
0.00002	0.00005	0.000043	15%	No	0.00002	Total Nickel (Ni)	0.000053	0.000054	2%	No	0.00002	0.000051
0.00004	0.000056	0.000058	4%	Yes	0.00004	Total Selenium (Se)	0.00005	0.000049	2%	Yes	0.00004	<0.000040
0.05	1.12	1.15	3%	No	0.05	Total Silicon (Si)	0.963	0.933	3%	No	0.05	1.04
0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050
0.00005	0.0197	0.0199	1%	No	0.00005	Total Strontium (Sr)	0.0178	0.018	1%	No	0.00005	0.0221
0.000002	<0.0000020	<0.0000020	BDL	No	0.000002	Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	<0.0000020
0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020
0.0005	<0.00050	<0.00050	BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050
0.000002	0.0000143	0.0000158	10%	No	0.000002	Total Uranium (U)	0.0000161	0.0000165	2%	No	0.000002	0.0000117
0.0002	<0.00020	<0.00020	BDL	No	0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020
0.0001	0.0303	0.0301	1%	No	0.0001	Total Zinc (Zn)	0.024	0.0239	0%	No	0.0001	0.0272
0.0001	<0.00010	<0.00010	BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010
0.05	8.49	8.49	0%	No	0.05	Total Calcium (Ca)	7.75	7.62	2%	No	0.05	8.92
0.05	0.6	0.604	1%	No	0.05	Total Magnesium (Mg)	0.559	0.553	1%	No	0.05	0.728
0.05	0.092	0.092	0%	Yes	0.05	Total Potassium (K)	0.089	0.088	1%	Yes	0.05	0.096
0.05	0.765	0.776	1%	No	0.05	Total Sodium (Na)	0.728	0.735	1%	No	0.05	0.777
3	3.5	4	13%	Yes	3	Total Sulphur (S)	<3.0	<3.0	BDL	No	3	4
			BDL	No		Calculated Parameters			BDL	No		
0.5	24.8	25.2	2%	No	0.5	Dissolved Hardness (CaCO3)	22.3	22.7	2%	No	0.5	26.9
			BDL	No		Dissolved Metals by ICPMS			BDL	No		
0.0005	0.0391	0.0401	3%	No	0.0005	Dissolved Aluminum (Al)	0.0387	0.0418	8%	No	0.0005	0.0692 (1)
0.00002	0.000051	0.000049	4%	No	0.00002	Dissolved Antimony (Sb)	0.000067	0.000071	6%	No	0.00002	0.000057
0.00002	0.00011	0.000105	5%	No	0.00002	Dissolved Arsenic (As)	0.000078	0.00008	3%	No	0.00002	0.000140 (1)
0.00002	0.00835	0.00846	1%	No	0.00002	Dissolved Barium (Ba)	0.00537	0.00551	3%	No	0.00002	0.0104 (1)
0.00001	<0.000010	<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010
0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050
0.01	<0.010	<0.010	BDL	No	0.01	Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	<0.010
0.000005	0.0000777	0.0000773	1%	No	0.000005	Dissolved Cadmium (Cd)	0.0000664	0.0000641	4%	No	0.000005	0.000142
0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	0.00012
0.000005	0.0000105	0.000009	15%	Yes	0.000005	Dissolved Cobalt (Co)	0.0000075	0.0000066	13%	Yes	0.000005	0.0000951
0.00005	0.00251	0.00258	3%	No	0.00005	Dissolved Copper (Cu)	0.0013	0.00135	4%	No	0.00005	0.0085
0.001	0.0054	0.0056	4%	No	0.001	Dissolved Iron (Fe)	0.0043	0.0043	0%	No	0.001	0.0422
0.000005	0.000255	0.000257	1%	No	0.000005	Dissolved Lead (Pb)	0.0000367	0.0000399	8%	No	0.000005	0.00441
0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050
0.00005	0.000847	0.000833	2%	No	0.00005	Dissolved Manganese (Mn)	0.000089	0.000122	31%	Yes	0.00005	0.00421
0.00005	0.000254	0.000253	0%	No	0.00005	Dissolved Molybdenum (Mo)	0.000213	0.000239	12%	No	0.00005	0.000249
0.00002	0.000035	0.000055	44%	Yes	0.00002	Dissolved Nickel (Ni)	0.000045	0.00006	29%	No	0.00002	0.000621
0.00004	0.000067	0.000059	13%	Yes	0.00004	Dissolved Selenium (Se)	0.000044	0.000049	11%	Yes	0.00004	0.000067
0.05	1.03	1.04	1%	No	0.05	Dissolved Silicon (Si)	0.926	0.919	1%	No	0.05	0.954
0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	0.0000051	BDL	Yes	0.000005	<0.0000050
0.00005	0.0206	0.0206	0%	No	0.00005	Dissolved Strontium (Sr)	0.0181	0.018	1%	No	0.00005	0.0209
0.000002	<0.0000020	<0.0000020	BDL	No	0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	<0.0000020
0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020
0.0005	<0.00050	<0.00050	BDL	No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	0.00081
0.000002	0.0000158	0.0000175	10%	No	0.000002	Dissolved Uranium (U)	0.0000154	0.000014	10%	No	0.000002	0.0000182
0.0002	<0.00020	<0.00020	BDL	No	0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.0002
0.0001	0.0304	0.0304	0%	No	0.0001	Dissolved Zinc (Zn)	0.024	0.0245	2%	No	0.0001	0.0651
0.0001	<0.00010	<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010
0.05	8.91	8.99	1%	No	0.05	Dissolved Calcium (Ca)	7.93	8.1	2%	No	0.05	9.38
0.05	0.63	0.653	4%	No	0.05	Dissolved Magnesium (Mg)	0.603	0.603	0%	No	0.05	0.851
0.05	0.101	0.103	2%	No	0.05	Dissolved Potassium (K)	0.089	0.09	1%	Yes	0.05	0.169
0.05	0.805	0.811	1%	No	0.05	Dissolved Sodium (Na)	0.766	0.769	0%	No	0.05	1.25
3	3.8	4	5%	Yes	3	Dissolved Sulphur (S)	3.4	3.4	0%	Yes	3	4.3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

				Duplicates							
MC-TP4 DC D	RPD	Within 2x DL	RDL	Sample ID	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	MC-TP4 DC	MC-TP4 DC D
28/05/2018				Sampling Date	30/06/2018	30/06/2018				24/06/2018	24/06/2018
				Calculated Parameters							
25.9	0.0234375		0.50	Total Hardness (CaCO3)	245	243	0.008196721	No	0.50	24.9	25.3
	BDL			Total Metals by ICPMS			BDL	No			
0.0381	4%	No	0.0005	Total Aluminum (Al)	0.278	0.265	5%	No	0.0005	0.0251	0.0259
0.00004	0%	No	0.00002	Total Antimony (Sb)	0.000343	0.00034	1%	No	0.00002	0.000051	0.000054
0.000096	3%	No	0.00002	Total Arsenic (As)	0.000094	0.00009	4%	No	0.00002	0.000125	0.000118
0.00766	1%	No	0.00002	Total Barium (Ba)	0.0173	0.0171	1%	No	0.00002	0.00674	0.00699
<0.000010	BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010
<0.0000050	BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050
<0.010	BDL	No	0.01	Total Boron (B)	0.018	0.018	0%	Yes	0.01	<0.010	<0.010
0.0000782	0%	No	0.000005	Total Cadmium (Cd)	0.000641	0.000632	1%	No	0.000005	0.0000744	0.0000762
<0.00010	BDL	No	0.0001	Total Chromium (Cr)	0.00013	0.00012	8%	Yes	0.0001	<0.00010	<0.00010
0.0000129	6%	No	0.000005	Total Cobalt (Co)	0.00078	0.000784	1%	No	0.000005	0.0000128	0.0000138
0.00177	2%	No	0.00005	Total Copper (Cu)	0.00935	0.00899	4%	No	0.00005	0.00141	0.00149
0.0096	4%	No	0.001	Total Iron (Fe)	0.0787	0.0728	8%	No	0.001	0.0051	0.0062
0.000204	3%	No	0.000005	Total Lead (Pb)	0.00101	0.000899	12%	No	0.000005	0.000167	0.000193
<0.00050	BDL	No	0.0005	Total Lithium (Li)	0.00213	0.00213	0%	No	0.0005	<0.00050	<0.00050
0.00125	0%	No	0.00005	Total Manganese (Mn)	0.234	0.236	1%	No	0.00005	0.00149	0.00164
0.000238	5%	No	0.00005	Total Molybdenum (Mo)	0.000518	0.000524	1%	No	0.00005	0.000262	0.000285
0.000067	27%	No	0.00002	Total Nickel (Ni)	0.00125	0.00126	1%	No	0.00002	0.000062	0.000077
<0.000040	BDL	No	0.00004	Total Selenium (Se)	0.000352	0.000316	11%	No	0.00004	0.000068	0.000069
1.04	0%	No	0.05	Total Silicon (Si)	2.6	2.67	3%	No	0.05	0.916	0.922
<0.0000050	BDL	No	0.000005	Total Silver (Ag)	0.00001	0.0000092	8%	Yes	0.000005	<0.0000050	<0.0000050
0.0221	0%	No	0.00005	Total Strontium (Sr)	0.305	0.306	0%	No	0.00005	0.0233	0.0235
<0.0000020	BDL	No	0.000002	Total Thallium (Tl)	0.0000092	0.0000096	4%	No	0.000002	<0.0000020	<0.0000020
<0.00020	BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020
<0.00050	BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050
0.000011	6%	No	0.000002	Total Uranium (U)	0.0000246	0.0000256	4%	No	0.000002	0.0000109	0.0000121
<0.00020	BDL	No	0.0002	Total Vanadium (V)	0.00021	0.00021	0%	Yes	0.0002	<0.00020	<0.00020
0.0275	1%	No	0.0001	Total Zinc (Zn)	0.215	0.214	0%	No	0.0001	0.0264	0.0275
<0.00010	BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010
9.15	3%	No	0.05	Total Calcium (Ca)	81.1	80.2	1%	No	0.05	8.75	8.88
0.74	2%	No	0.05	Total Magnesium (Mg)	10.2	10.4	2%	No	0.05	0.733	0.753
0.098	2%	Yes	0.05	Total Potassium (K)	0.975	0.986	1%	No	0.05	0.103	0.106
0.791	2%	No	0.05	Total Sodium (Na)	6.87	6.97	1%	No	0.05	0.806	0.821
4.1	2%	Yes	3	Total Sulphur (S)	70.1	70.6	1%	No	3	4.2	4.1
				Calculated Parameters			BDL	No		24.7	24.9
24.4	10%	No	0.5	Dissolved Hardness (CaCO3)	246	244	1%	No	0.5		
	BDL	No		Dissolved Metals by ICPMS			BDL	No			
0.0329	BDL	No	0.0005	Dissolved Aluminum (Al)	0.0714	0.0704	1%	No	0.0005	0.0231	0.0233
0.000045	24%	No	0.00002	Dissolved Antimony (Sb)	0.000342	0.000327	4%	No	0.00002	0.000053	0.000052
0.000091	BDL	No	0.00002	Dissolved Arsenic (As)	0.000054	0.000053	2%	No	0.00002	0.000131	0.00013
0.00706	BDL	No	0.00002	Dissolved Barium (Ba)	0.0159	0.0155	3%	No	0.00002	0.00706	0.00714
<0.000010	BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010
<0.0000050	BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050
<0.010	BDL	No	0.01	Dissolved Boron (B)	0.019	0.018	5%	Yes	0.01	<0.010	<0.010
0.000112	24%	No	0.000005	Dissolved Cadmium (Cd)	0.000616	0.000604	2%	No	0.000005	0.0000733	0.0000731
<0.00010	BDL	Yes	0.0001	Dissolved Chromium (Cr)	0.00011	<0.00010	BDL	Yes	0.0001	<0.00010	<0.00010
0.0000158	143%	No	0.000005	Dissolved Cobalt (Co)	0.000706	0.000704	0%	No	0.000005	0.0000106	0.0000123
0.00555	42%	No	0.00005	Dissolved Copper (Cu)	0.00268	0.00257	4%	No	0.00005	0.00159	0.00155
0.0062	149%	No	0.001	Dissolved Iron (Fe)	0.0034	0.0031	9%	No	0.001	0.0026	0.0027
0.00155	96%	No	0.000005	Dissolved Lead (Pb)	0.000372	0.000365	2%	No	0.000005	0.000141	0.000178
<0.00050	BDL	No	0.0005	Dissolved Lithium (Li)	0.00223	0.00219	2%	No	0.0005	<0.00050	<0.00050
0.00111	117%	No	0.00005	Dissolved Manganese (Mn)	0.22	0.219	0%	No	0.00005	0.00121	0.00115
0.000213	16%	No	0.00005	Dissolved Molybdenum (Mo)	0.000496	0.000508	2%	No	0.00005	0.000271	0.000276
0.000247	86%	No	0.00002	Dissolved Nickel (Ni)	0.00118	0.0011	7%	No	0.00002	0.000174	0.000172
0.000054	21%	Yes	0.00004	Dissolved Selenium (Se)	0.000323	0.000323	0%	No	0.00004	0.000066	0.00006
0.921	4%	No	0.05	Dissolved Silicon (Si)	2.74	2.7	1%	No	0.05	0.918	0.973
<0.0000050	BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050
0.0206	1%	No	0.00005	Dissolved Strontium (Sr)	0.325	0.325	0%	No	0.00005	0.0226	0.0222
<0.0000020	BDL	No	0.000002	Dissolved Thallium (Tl)	0.0000077	0.000008	4%	No	0.000002	<0.0000020	<0.0000020
<0.00020	BDL	No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020
<0.00050	BDL	Yes	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050
0.0000102	56%	No	0.000002	Dissolved Uranium (U)	0.00002	0.0000191	5%	No	0.000002	0.0000116	0.000012
<0.00020	BDL	Yes	0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020
0.0321	68%	No	0.0001	Dissolved Zinc (Zn)	0.187	0.184	2%	No	0.0001	0.0271	0.0264
<0.00010	BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010
8.6	9%	No	0.05	Dissolved Calcium (Ca)	81	80.5	1%	No	0.05	8.66	8.74
0.7	19%	No	0.05	Dissolved Magnesium (Mg)	10.5	10.4	1%	No	0.05	0.744	0.736
0.102	49%	No	0.05	Dissolved Potassium (K)	1.03	1	3%	No	0.05	0.108	0.107
0.888	34%	No	0.05	Dissolved Sodium (Na)	6.88	6.82	1%	No	0.05	0.852	0.848
3.4	23%	Yes	3	Dissolved Sulphur (S)	72.8	73	0%	No	3	4.4	4.5

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

			Duplicates								
RPD	Within 2x DL	RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	MP-EFF DC	MP-EFF DC D	RPD
			Sampling Date	17/07/2018	11/07/2018				22/07/2018	22/07/2018	
			Calculated Parameters								
0.015936255	No	0.50	Total Hardness (CaCO3)	32.4	41.3	0.241519674	No	0.50	224	222	0.00896861
BDL	No		Total Metals by ICPMS			BDL	No				BDL
3%	No	0.0005	Total Aluminum (Al)	0.028	0.0304	8%	No	0.0005	0.156	0.161	3%
6%	No	0.00002	Total Antimony (Sb)	0.000073	0.000096	27%	No	0.00002	0.000262	0.000258	2%
6%	No	0.00002	Total Arsenic (As)	0.000166	0.000244	38%	No	0.00002	0.000087	0.000091	4%
4%	No	0.00002	Total Barium (Ba)	0.00885	0.0101	13%	No	0.00002	0.0134	0.0143	6%
BDL	No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL
BDL	No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL
BDL	No	0.01	Total Boron (B)	<0.010	<0.010	BDL	No	0.01	0.014	0.014	0%
2%	No	0.000005	Total Cadmium (Cd)	0.0000927	0.000118	24%	No	0.000005	0.000275	0.000277	1%
BDL	No	0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	0.0001	BDL
8%	No	0.000005	Total Cobalt (Co)	0.0000159	0.000011	36%	No	0.000005	0.000132	0.000123	7%
6%	No	0.00005	Total Copper (Cu)	0.00147	0.00125	16%	No	0.00005	0.005	0.00529	6%
19%	No	0.001	Total Iron (Fe)	0.0074	0.0032	79%	No	0.001	0.0181	0.0253	33%
14%	No	0.000005	Total Lead (Pb)	0.000212	0.000126	51%	No	0.000005	0.000647	0.000809	22%
BDL	No	0.0005	Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00189	0.00189	0%
10%	No	0.00005	Total Manganese (Mn)	0.00273	0.00191	35%	No	0.00005	0.0216	0.0221	2%
8%	No	0.00005	Total Molybdenum (Mo)	0.000348	0.000415	18%	No	0.00005	0.000489	0.000471	4%
22%	No	0.00002	Total Nickel (Ni)	0.000076	0.000114	40%	No	0.00002	0.000438	0.000489	11%
1%	Yes	0.00004	Total Selenium (Se)	0.000092	0.000113	20%	No	0.00004	0.00035	0.000355	1%
1%	No	0.05	Total Silicon (Si)	1.12	1.23	9%	No	0.05	2.79	2.76	1%
BDL	No	0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL
1%	No	0.00005	Total Strontium (Sr)	0.0309	0.0412	29%	No	0.00005	0.296	0.294	1%
BDL	No	0.000002	Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.000008	0.0000073	9%
BDL	No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL
BDL	No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL
10%	No	0.000002	Total Uranium (U)	0.0000105	0.0000107	2%	No	0.000002	0.0000162	0.0000165	2%
BDL	No	0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.0003	0.00031	3%
4%	No	0.0001	Total Zinc (Zn)	0.0312	0.0346	10%	No	0.0001	0.0792	0.0803	1%
BDL	No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL
1%	No	0.05	Total Calcium (Ca)	11.4	14.5	24%	No	0.05	77.6	76.9	1%
3%	No	0.05	Total Magnesium (Mg)	0.95	1.23	26%	No	0.05	7.37	7.4	0%
3%	No	0.05	Total Potassium (K)	0.146	0.179	20%	No	0.05	0.784	0.794	1%
2%	No	0.05	Total Sodium (Na)	1.07	1.35	23%	No	0.05	5.96	5.94	0%
2%	Yes	3	Total Sulphur (S)	6.4	9.3	37%	No	3	65	65.4	1%
1%	No	0.5	Calculated Parameters			BDL	No				BDL
BDL	No		Dissolved Hardness (CaCO3)	29.3	36.8	23%	No	0.5	203	226	11%
BDL	No		Dissolved Metals by ICPMS			BDL	No				BDL
1%	No	0.0005	Dissolved Aluminum (Al)	0.0228	0.0275	19%	No	0.0005	0.0723	0.0901	22%
2%	No	0.00002	Dissolved Antimony (Sb)	0.000073	0.000095	26%	No	0.00002	0.000221	0.000252	13%
1%	No	0.00002	Dissolved Arsenic (As)	0.000144	0.000213	39%	No	0.00002	0.000077	0.000079	3%
1%	No	0.00002	Dissolved Barium (Ba)	0.0086	0.00944	9%	No	0.00002	0.0128	0.0141	10%
BDL	No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL
BDL	No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL
BDL	No	0.01	Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.012	0.014	15%
0%	No	0.000005	Dissolved Cadmium (Cd)	0.0000911	0.000115	23%	No	0.000005	0.00022	0.00024	9%
BDL	No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL
15%	No	0.000005	Dissolved Cobalt (Co)	0.0000156	0.0000096	48%	Yes	0.000005	0.000069	0.0000773	11%
3%	No	0.00005	Dissolved Copper (Cu)	0.0015	0.00169 (1)	BDL	No	0.00005	0.0012	0.0012	0%
4%	No	0.001	Dissolved Iron (Fe)	0.0036	0.0023	44%	No	0.001	0.0017	0.0027	45%
23%	No	0.000005	Dissolved Lead (Pb)	0.000261 (1)	0.000160 (1)	BDL	No	0.000005	0.00016	0.000155	3%
BDL	No	0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00172	0.00194	12%
5%	No	0.00005	Dissolved Manganese (Mn)	0.00144	0.000915	45%	No	0.00005	0.00791	0.00865	9%
2%	No	0.00005	Dissolved Molybdenum (Mo)	0.000351	0.000376	7%	No	0.00005	0.000437	0.000508	15%
1%	No	0.00002	Dissolved Nickel (Ni)	0.000194	0.000179	8%	No	0.00002	0.000328	0.000434	28%
10%	Yes	0.00004	Dissolved Selenium (Se)	0.000095	0.000105	10%	No	0.00004	0.000296	0.000334	12%
6%	No	0.05	Dissolved Silicon (Si)	0.871	0.946	8%	No	0.05	2.41	2.7	11%
BDL	No	0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL
2%	No	0.00005	Dissolved Strontium (Sr)	0.0286	0.0371	26%	No	0.00005	0.271	0.301	10%
BDL	No	0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000062	0.0000066	6%
BDL	No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL
BDL	No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL
3%	No	0.000002	Dissolved Uranium (U)	0.000009	0.0000091	1%	No	0.000002	0.0000135	0.0000153	13%
BDL	No	0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.00029	0.00032	10%
3%	No	0.0001	Dissolved Zinc (Zn)	0.0311	0.034	9%	No	0.0001	0.0511	0.0531	4%
BDL	No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL
1%	No	0.05	Dissolved Calcium (Ca)	10.2	12.8	23%	No	0.05	70.1	78	11%
1%	No	0.05	Dissolved Magnesium (Mg)	0.901	1.18	27%	No	0.05	6.92	7.64	10%
1%	No	0.05	Dissolved Potassium (K)	0.139	0.173	22%	No	0.05	0.709	0.804	13%
0%	No	0.05	Dissolved Sodium (Na)	1.1	1.32	18%	No	0.05	5.52	6.08	10%
2%	Yes	3	Dissolved Sulphur (S)	5.7	8.1	35%	Yes	3	57.3	63.7	11%

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

		Duplicates									
Within 2x DL	RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL
		Sampling Date	11/08/2018	11/08/2018				16/08/2018	16/08/2018		
		Calculated Parameters									
No	0.50	Total Hardness (CaCO3)	59.2	59.8	0.010084034	No	0.50	253	260	0.027290448	No
No		Total Metals by ICPMS			BDL	No				BDL	No
No	0.0005	Total Aluminum (Al)	0.0249	0.025	0%	No	0.0005	0.144	0.147	2%	No
No	0.00002	Total Antimony (Sb)	0.000143	0.000137	4%	No	0.00002	0.000236	0.000234	1%	No
No	0.00002	Total Arsenic (As)	0.000162	0.000154	5%	No	0.00002	0.000096	0.000088	9%	No
No	0.00002	Total Barium (Ba)	0.0166	0.0167	1%	No	0.00002	0.0125	0.0123	2%	No
No	0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No
No	0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No
Yes	0.01	Total Boron (B)	<0.010	<0.010	BDL	No	0.01	0.024	0.024	0%	No
No	0.000005	Total Cadmium (Cd)	0.000324	0.000325	0%	No	0.000005	0.000407	0.000404	1%	No
Yes	0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No
No	0.000005	Total Cobalt (Co)	0.000033	0.0000285	15%	No	0.000005	0.000142	0.000135	5%	No
No	0.00005	Total Copper (Cu)	0.00241	0.00242	0%	No	0.00005	0.0046	0.00455	1%	No
No	0.001	Total Iron (Fe)	0.0059	0.0067	13%	No	0.001	0.0106	0.0102	4%	No
No	0.000005	Total Lead (Pb)	0.000175	0.000175	0%	No	0.000005	0.000641	0.000454	34%	No
No	0.0005	Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00256	0.00262	2%	No
No	0.00005	Total Manganese (Mn)	0.00455	0.00461	1%	No	0.00005	0.0253	0.0252	0%	No
No	0.00005	Total Molybdenum (Mo)	0.000457	0.000438	4%	No	0.00005	0.000498	0.000521	5%	No
No	0.00002	Total Nickel (Ni)	0.000577	0.000624	8%	No	0.00002	0.000383	0.000356	7%	No
No	0.00004	Total Selenium (Se)	0.000167	0.000161	4%	No	0.00004	0.000399	0.000403	1%	No
No	0.05	Total Silicon (Si)	1.37	1.44	5%	No	0.05	2.61	2.62	0%	No
No	0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No
No	0.00005	Total Strontium (Sr)	0.0669	0.0686	3%	No	0.00005	0.373	0.369	1%	No
No	0.000002	Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000086	0.0000096	11%	No
No	0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No
No	0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No
No	0.000002	Total Uranium (U)	0.0000091	0.00001	9%	No	0.000002	0.0000304	0.0000297	2%	No
Yes	0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.00027	0.00026	4%	Yes
No	0.0001	Total Zinc (Zn)	0.094	0.0952	1%	No	0.0001	0.0764	0.0776	2%	No
No	0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No
No	0.05	Total Calcium (Ca)	20.6	20.8	1%	No	0.05	85.5	87.9	3%	No
No	0.05	Total Magnesium (Mg)	1.87	1.9	2%	No	0.05	9.57	9.76	2%	No
No	0.05	Total Potassium (K)	0.244	0.254	4%	No	0.05	1.04	1.05	1%	No
No	0.05	Total Sodium (Na)	1.73	1.7	2%	No	0.05	8.12	8.09	0%	No
No	3	Total Sulphur (S)	15.3	15.6	2%	No	3	81.7	82.7	1%	No
No		Calculated Parameters			BDL	No				BDL	No
No	0.5	Dissolved Hardness (CaCO3)	61.2	58.7	4%	No	0.5	249	259	4%	No
No		Dissolved Metals by ICPMS			BDL	No				BDL	No
No	0.0005	Dissolved Aluminum (Al)	0.0233	0.0198	16%	No	0.0005	0.11	0.115	4%	No
No	0.00002	Dissolved Antimony (Sb)	0.00014	0.000134	4%	No	0.00002	0.000229	0.000222	3%	No
No	0.00002	Dissolved Arsenic (As)	0.000152	0.000141	8%	No	0.00002	0.000101	0.000099	2%	No
No	0.00002	Dissolved Barium (Ba)	0.0161	0.0156	3%	No	0.00002	0.012	0.0123	2%	No
No	0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No
No	0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No
Yes	0.01	Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.023	0.024	4%	No
No	0.000005	Dissolved Cadmium (Cd)	0.000301	0.000294	2%	No	0.000005	0.000333	0.000369	10%	No
No	0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	0.00012	<0.00010	BDL	Yes
No	0.000005	Dissolved Cobalt (Co)	0.0000326	0.0000242	30%	No	0.000005	0.000104	0.0000981	6%	No
No	0.00005	Dissolved Copper (Cu)	0.00246	0.00247	0%	No	0.00005	0.00296	0.0043	37%	No
Yes	0.001	Dissolved Iron (Fe)	0.0039	0.003	26%	No	0.001	0.0036	0.0014	88%	Yes
No	0.000005	Dissolved Lead (Pb)	0.000242	0.00017	35%	No	0.000005	0.000156	0.000105	39%	No
No	0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00258	0.00259	0%	No
No	0.00005	Dissolved Manganese (Mn)	0.00379	0.00373	2%	No	0.00005	0.0167	0.0171	2%	No
No	0.00005	Dissolved Molybdenum (Mo)	0.000373	0.000368	1%	No	0.00005	0.000479	0.0005	4%	No
No	0.00002	Dissolved Nickel (Ni)	0.000539	0.000536	1%	No	0.00002	0.000364	0.000305	18%	No
No	0.00004	Dissolved Selenium (Se)	0.000163	0.000159	2%	No	0.00004	0.000347	0.000398	14%	No
No	0.05	Dissolved Silicon (Si)	1.31	1.3	1%	No	0.05	2.33	2.41	3%	No
No	0.000005	Dissolved Silver (Ag)	0.0000095	0.0000057	50%	Yes	0.000005	<0.0000050	<0.0000050	BDL	No
No	0.00005	Dissolved Strontium (Sr)	0.061	0.0588	4%	No	0.00005	0.335	0.349	4%	No
No	0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000098	0.0000092	6%	No
No	0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No
No	0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No
No	0.000002	Dissolved Uranium (U)	0.0000092	0.0000083	10%	No	0.000002	0.0000246	0.0000235	5%	No
Yes	0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.00026	0.00028	7%	Yes
No	0.0001	Dissolved Zinc (Zn)	0.091	0.0858	6%	No	0.0001	0.0463	0.047	2%	No
No	0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No
No	0.05	Dissolved Calcium (Ca)	21.4	20.6	4%	No	0.05	84.5	87.8	4%	No
No	0.05	Dissolved Magnesium (Mg)	1.86	1.76	6%	No	0.05	9.18	9.56	4%	No
No	0.05	Dissolved Potassium (K)	0.249	0.236	5%	No	0.05	0.991	1.03	4%	No
No	0.05	Dissolved Sodium (Na)	1.74	1.69	3%	No	0.05	7.85	8.07	3%	No
No	3	Dissolved Sulphur (S)	15	14.3	5%	No	3	73.6	79	7%	No

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

		Duplicates										
RDL	Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	
	Sampling Date	27/08/2018	27/08/2018				04/09/2018	04/09/2018				
	Calculated Parameters											
0.50	Total Hardness (CaCO3)	94.7	95	0.003162889	No	0.50	240	234	0.025316456	No	0.50	
	Total Metals by ICPMS			BDL	No				BDL	No		
0.0005	Total Aluminum (Al)	0.0361	0.0379	5%	No	0.0005	0.262	0.258	2%	No	0.0005	
0.00002	Total Antimony (Sb)	0.000107	0.00011	3%	No	0.00002	0.000169	0.000149	13%	No	0.00002	
0.00002	Total Arsenic (As)	0.000114	0.00011	4%	No	0.00002	0.000181	0.000161	12%	No	0.00002	
0.00002	Total Barium (Ba)	0.0184	0.0187	2%	No	0.00002	0.015	0.0143	5%	No	0.00002	
0.00001	Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	
0.000005	Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	
0.01	Total Boron (B)	<0.010	<0.010	BDL	No	0.01	0.02	0.02	0%	No	0.01	
0.000005	Total Cadmium (Cd)	0.000341	0.000356	4%	No	0.000005	0.00101	0.000992	2%	No	0.000005	
0.0001	Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	0.00014	0.00016	13%	Yes	0.0001	
0.000005	Total Cobalt (Co)	0.0000604	0.0000587	3%	No	0.000005	0.000501	0.000517	3%	No	0.000005	
0.00005	Total Copper (Cu)	0.00266	0.00252	5%	No	0.00005	0.0296	0.0287	3%	No	0.00005	
0.001	Total Iron (Fe)	0.0058	0.0067	14%	No	0.001	0.105	0.0976	7%	No	0.001	
0.000005	Total Lead (Pb)	0.0000959	0.000121	23%	No	0.000005	0.00429	0.00415	3%	No	0.000005	
0.0005	Total Lithium (Li)	0.00051	<0.00050	BDL	Yes	0.0005	0.0021	0.00209	0%	No	0.0005	
0.00005	Total Manganese (Mn)	0.0111	0.0117	5%	No	0.00005	0.0832	0.0815	2%	No	0.00005	
0.00005	Total Molybdenum (Mo)	0.000447	0.000432	3%	No	0.00005	0.000371	0.00033	12%	No	0.00005	
0.00002	Total Nickel (Ni)	0.000243	0.000249	2%	No	0.00002	0.000847	0.000879	4%	No	0.00002	
0.00004	Total Selenium (Se)	0.000197	0.000195	1%	No	0.00004	0.000316	0.000319	1%	No	0.00004	
0.05	Total Silicon (Si)	1.76	1.74	1%	No	0.05	2.79	2.75	1%	No	0.05	
0.000005	Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	0.0000148	0.0000176	17%	No	0.000005	
0.00005	Total Strontium (Sr)	0.1	0.0985	2%	No	0.00005	0.296	0.299	1%	No	0.00005	
0.000002	Total Thallium (Tl)	0.0000027	0.0000021	25%	Yes	0.000002	0.0000073	0.0000068	7%	No	0.000002	
0.0002	Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	
0.0005	Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005	
0.000002	Total Uranium (U)	0.0000136	0.0000135	1%	No	0.000002	0.0000311	0.0000311	0%	No	0.000002	
0.0002	Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.0004	0.00042	5%	No	0.0002	
0.0001	Total Zinc (Zn)	0.105	0.105	0%	No	0.0001	0.35	0.338	3%	No	0.0001	
0.0001	Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	
0.05	Total Calcium (Ca)	32.6	32.8	1%	No	0.05	82.2	80	3%	No	0.05	
0.05	Total Magnesium (Mg)	3.2	3.17	1%	No	0.05	8.37	8.24	2%	No	0.05	
0.05	Total Potassium (K)	0.387	0.39	1%	No	0.05	0.977	0.954	2%	No	0.05	
0.05	Total Sodium (Na)	2.94	2.9	1%	No	0.05	7.02	6.77	4%	No	0.05	
3	Total Sulphur (S)	26.1	25.3	3%	No	3	74.1	73.8	0%	No	3	
	Calculated Parameters			BDL	No				BDL	No		
0.5	Dissolved Hardness (CaCO3)	94.9	91.6	4%	No	0.5	242	241	0%	No	0.5	
	Dissolved Metals by ICPMS			BDL	No				BDL	No		
0.0005	Dissolved Aluminum (Al)	0.0314	0.0308	2%	No	0.0005	0.116	0.115	1%	No	0.0005	
0.00002	Dissolved Antimony (Sb)	0.000108	0.000105	3%	No	0.00002	0.000139	0.000145	4%	No	0.00002	
0.00002	Dissolved Arsenic (As)	0.000109	0.000108	1%	No	0.00002	0.000078	0.000082	5%	No	0.00002	
0.00002	Dissolved Barium (Ba)	0.0182	0.0183	1%	No	0.00002	0.0107	0.0107	0%	No	0.00002	
0.00001	Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001	
0.000005	Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	
0.01	Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.02	0.02	0%	No	0.01	
0.000005	Dissolved Cadmium (Cd)	0.000334	0.000326	2%	No	0.000005	0.000578	0.000556	4%	No	0.000005	
0.0001	Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	
0.000005	Dissolved Cobalt (Co)	0.0000487	0.0000484	1%	No	0.000005	0.000109	0.000104	5%	No	0.000005	
0.00005	Dissolved Copper (Cu)	0.00135	0.00135	0%	No	0.00005	0.00163	0.00168	3%	No	0.00005	
0.001	Dissolved Iron (Fe)	<0.0010	<0.0010	BDL	No	0.001	0.0016	<0.0010	BDL	Yes	0.001	
0.000005	Dissolved Lead (Pb)	0.0000071	0.0000071	0%	Yes	0.000005	0.000102	0.0000686	39%	No	0.000005	
0.0005	Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00196	0.00193	2%	No	0.0005	
0.00005	Dissolved Manganese (Mn)	0.00819	0.00816	0%	No	0.00005	0.0168	0.0164	2%	No	0.00005	
0.00005	Dissolved Molybdenum (Mo)	0.000427	0.000423	1%	No	0.00005	0.000304	0.000313	3%	No	0.00005	
0.00002	Dissolved Nickel (Ni)	0.000215	0.000212	1%	No	0.00002	0.000322	0.000291	10%	No	0.00002	
0.00004	Dissolved Selenium (Se)	0.000178	0.000184	3%	No	0.00004	0.000312	0.000292	7%	No	0.00004	
0.05	Dissolved Silicon (Si)	1.67	1.64	2%	No	0.05	2.55	2.51	2%	No	0.05	
0.000005	Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005	
0.00005	Dissolved Strontium (Sr)	0.096	0.0955	1%	No	0.00005	0.298	0.287	4%	No	0.00005	
0.000002	Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000077	0.0000081	5%	No	0.000002	
0.0002	Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002	
0.0005	Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	0.00064	<0.00050	BDL	Yes	0.0005	
0.000002	Dissolved Uranium (U)	0.0000121	0.0000125	3%	No	0.000002	0.0000164	0.000018	9%	No	0.000002	
0.0002	Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.00027	0.00031	14%	Yes	0.0002	
0.0001	Dissolved Zinc (Zn)	0.0969	0.0967	0%	No	0.0001	0.07	0.0676	3%	No	0.0001	
0.0001	Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001	
0.05	Dissolved Calcium (Ca)	32.8	31.6	4%	No	0.05	83.1	82.8	0%	No	0.05	
0.05	Dissolved Magnesium (Mg)	3.12	3.08	1%	No	0.05	8.38	8.36	0%	No	0.05	
0.05	Dissolved Potassium (K)	0.385	0.38	1%	No	0.05	0.951	0.949	0%	No	0.05	
0.05	Dissolved Sodium (Na)	2.84	2.86	1%	No	0.05	7.05	7.05	0%	No	0.05	
3	Dissolved Sulphur (S)	24.6	24	2%	No	3	71.1	69.6	2%	No	3	

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Duplicates									
Sample ID	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	MP-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL
Sampling Date	09/09/2018	09/09/2018				14/09/2018	14/09/2018			
Calculated Parameters										
Total Hardness (CaCO3)	178	186	0.043956044	No	0.50	45	45.9	0.01980198	No	0.50
Total Metals by ICPMS			BDL	No				BDL	No	
Total Aluminum (Al)	0.112	0.112	0%	No	0.0005	0.0481	0.0469	3%	No	0.0005
Total Antimony (Sb)	0.000248	0.000251	1%	No	0.00002	0.00007	0.000064	9%	No	0.00002
Total Arsenic (As)	0.000212	0.000188	12%	No	0.00002	0.000155	0.000155	0%	No	0.00002
Total Barium (Ba)	0.0128	0.0132	3%	No	0.00002	0.0103	0.0106	3%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	0.015	0.016	6%	Yes	0.01	<0.010	<0.010	BDL	No	0.01
Total Cadmium (Cd)	0.000508	0.000528	4%	No	0.000005	0.000159	0.000164	3%	No	0.000005
Total Chromium (Cr)	0.00016	0.00012	29%	Yes	0.0001	0.00013	<0.00010	BDL	Yes	0.0001
Total Cobalt (Co)	0.00011	0.000113	3%	No	0.000005	0.0000263	0.0000241	9%	No	0.000005
Total Copper (Cu)	0.00467	0.00469	0%	No	0.00005	0.00266	0.00262	2%	No	0.00005
Total Iron (Fe)	0.0596	0.0547	9%	No	0.001	0.0174	0.0158	10%	No	0.001
Total Lead (Pb)	0.00121	0.00115	5%	No	0.000005	0.000292	0.000261	11%	No	0.000005
Total Lithium (Li)	0.00148	0.0015	1%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Manganese (Mn)	0.0161	0.0164	2%	No	0.00005	0.00338	0.00324	4%	No	0.00005
Total Molybdenum (Mo)	0.000679	0.000665	2%	No	0.00005	0.000323	0.000306	5%	No	0.00005
Total Nickel (Ni)	0.000465	0.000483	4%	No	0.00002	0.000104	0.000079	27%	No	0.00002
Total Selenium (Se)	0.000454	0.000432	5%	No	0.00004	0.000124	0.000111	11%	No	0.00004
Total Silicon (Si)	1.98	2.11	6%	No	0.05	1.22	1.26	3%	No	0.05
Total Silver (Ag)	0.0000084	<0.0000050	BDL	Yes	0.000005	0.0000078	<0.0000050	BDL	Yes	0.000005
Total Strontium (Sr)	0.232	0.25	7%	No	0.00005	0.0435	0.0428	2%	No	0.00005
Total Thallium (Tl)	0.0000067	0.0000064	5%	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	0.00138	<0.00050	BDL	No	0.0005	0.00059	<0.00050	BDL	Yes	0.0005
Total Uranium (U)	0.00001	0.0000102	2%	No	0.000002	0.0000138	0.0000142	3%	No	0.000002
Total Vanadium (V)	0.00023	0.00022	4%	Yes	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Zinc (Zn)	0.101	0.103	2%	No	0.0001	0.0461	0.0466	1%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	62.9	65.7	4%	No	0.05	16.4	16.7	2%	No	0.05
Total Magnesium (Mg)	5.03	5.34	6%	No	0.05	0.979	0.994	2%	No	0.05
Total Potassium (K)	0.705	0.72	2%	No	0.05	0.169	0.167	1%	No	0.05
Total Sodium (Na)	5.28	5.46	3%	No	0.05	1.24	1.23	1%	No	0.05
Total Sulphur (S)	54.9	56	2%	No	3	10.1	9.8	3%	No	3
Calculated Parameters			BDL	No				BDL	No	
Dissolved Hardness (CaCO3)	186	178	4%	No	0.5	40.5	41.8	3%	No	0.5
Dissolved Metals by ICPMS			BDL	No				BDL	No	
Dissolved Aluminum (Al)	0.0339	0.0318	6%	No	0.0005	0.0338	0.0327	3%	No	0.0005
Dissolved Antimony (Sb)	0.000255	0.000255	0%	No	0.00002	0.000072	0.000063	13%	No	0.00002
Dissolved Arsenic (As)	0.000097	0.000093	4%	No	0.00002	0.00014	0.000143	2%	No	0.00002
Dissolved Barium (Ba)	0.0134	0.013	3%	No	0.00002	0.0105	0.0104	1%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	0.016	0.016	0%	Yes	0.01	<0.010	<0.010	BDL	No	0.01
Dissolved Cadmium (Cd)	0.000502	0.000497	1%	No	0.000005	0.000153	0.00015	2%	No	0.000005
Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	0.00016	<0.00010	BDL	Yes	0.0001
Dissolved Cobalt (Co)	0.0000864	0.0000877	1%	No	0.000005	0.0000198	0.0000188	5%	No	0.000005
Dissolved Copper (Cu)	0.00199	0.00217	9%	No	0.00005	0.00234	0.00248	6%	No	0.00005
Dissolved Iron (Fe)	0.012	<0.0010	BDL	No	0.001	0.0148	0.0036	122%	No	0.001
Dissolved Lead (Pb)	0.00012	0.0000568	71%	No	0.000005	0.000154	0.000105	38%	No	0.000005
Dissolved Lithium (Li)	0.00142	0.00136	4%	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Manganese (Mn)	0.0113	0.0111	2%	No	0.00005	0.00136	0.00121	12%	No	0.00005
Dissolved Molybdenum (Mo)	0.000664	0.00068	2%	No	0.00005	0.000306	0.00029	5%	No	0.00005
Dissolved Nickel (Ni)	0.000443	0.000429	3%	No	0.00002	0.000145	0.000084	53%	No	0.00002
Dissolved Selenium (Se)	0.000437	0.000409	7%	No	0.00004	0.000105	0.000104	1%	No	0.00004
Dissolved Silicon (Si)	2.12	2.21	4%	No	0.05	1.03	1.05	2%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.252	0.252	0%	No	0.00005	0.0402	0.04	0%	No	0.00005
Dissolved Thallium (Tl)	0.0000064	0.0000058	10%	No	0.000002	<0.0000020	<0.0000020	BDL	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000081	0.0000081	0%	No	0.000002	0.0000111	0.0000134	19%	No	0.000002
Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Zinc (Zn)	0.0837	0.0804	4%	No	0.0001	0.0422	0.041	3%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	65	62.2	4%	No	0.05	14.8	15.3	3%	No	0.05
Dissolved Magnesium (Mg)	5.65	5.59	1%	No	0.05	0.878	0.864	2%	No	0.05
Dissolved Potassium (K)	0.748	0.743	1%	No	0.05	0.156	0.148	5%	No	0.05
Dissolved Sodium (Na)	5.72	5.72	0%	No	0.05	1.13	1.11	2%	No	0.05
Dissolved Sulphur (S)	55.4	56.5	2%	No	3	9.3	9	3%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Duplicates									
Sample ID	MC-TP4 DC	MC-TP4 DC D	RPD	Within 2x DL	RDL	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL
Sampling Date	23/09/2018	23/09/2018				28/09/2018	28/09/2018			
Calculated Parameters										
Total Hardness (CaCO3)	42	40.8	0.028985507	No	0.50	146	238	0.479166667	No	0.50
Total Metals by ICPMS										
			BDL	No				BDL	No	
Total Aluminum (Al)	0.0361	0.0346	4%	No	0.003	0.0595	0.102	53%	No	0.003
Total Antimony (Sb)	0.000075	0.000073	3%	No	0.00002	0.000176	0.000221	23%	No	0.00002
Total Arsenic (As)	0.000127	0.000127	0%	No	0.00002	0.000057	0.000113	66%	No	0.00002
Total Barium (Ba)	0.0103	0.011	7%	No	0.00005	0.00898	0.0154	53%	No	0.00005
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.000010	<0.0000050	BDL	No	0.00001	<0.000010	<0.0000050	BDL	No	0.00001
Total Boron (B)	<0.010	<0.010	BDL	No	0.01	<0.010	0.016	BDL	Yes	0.01
Total Cadmium (Cd)	0.000167	0.000162	3%	No	0.000005	0.000368	0.000652	56%	No	0.000005
Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Cobalt (Co)	0.00002	0.0000184	8%	Yes	0.00001	0.000063	0.000106	51%	No	0.00001
Total Copper (Cu)	0.00268	0.00258	4%	No	0.0001	0.00163	0.00266	48%	No	0.0001
Total Iron (Fe)	0.007	0.0069	1%	Yes	0.005	0.0103	0.0163	45%	No	0.005
Total Lead (Pb)	0.000151	0.00015	1%	No	0.00002	0.000202	0.000324	46%	No	0.00002
Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00107	0.00202	61%	No	0.0005
Total Manganese (Mn)	0.00161	0.00157	3%	No	0.0001	0.00799	0.0153	63%	No	0.0001
Total Molybdenum (Mo)	0.000304	0.000277	9%	No	0.00005	0.000345	0.000598	54%	No	0.00005
Total Nickel (Ni)	0.00012	0.000116	3%	Yes	0.0001	0.00013	0.000247	62%	Yes	0.0001
Total Selenium (Se)	0.000119	0.000124	4%	No	0.00004	0.000249	0.000387	43%	No	0.00004
Total Silicon (Si)	1.39	1.36	2%	No	0.05	1.39	2.33	51%	No	0.05
Total Silver (Ag)	<0.000010	<0.0000050	BDL	No	0.00001	<0.000010	<0.0000050	BDL	No	0.00001
Total Strontium (Sr)	0.0401	0.0394	2%	No	0.00005	0.189	0.35	60%	No	0.00005
Total Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000054	0.0000103	62%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.0020	<0.00050	BDL	No	0.002	<0.0020	0.00055	BDL	Yes	0.002
Total Uranium (U)	0.000012	0.0000132	10%	No	0.000005	0.0000084	0.0000232	94%	Yes	0.000005
Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Zinc (Zn)	0.0502	0.051	2%	No	0.001	0.051	0.0842	49%	No	0.001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	15.2	14.7	3%	No	0.25	50.5	81.4	47%	No	0.25
Total Magnesium (Mg)	0.98	0.973	1%	No	0.25	4.92	8.5	53%	No	0.25
Total Potassium (K)	<0.25	0.177	BDL	Yes	0.25	0.79	1.32	50%	No	0.25
Total Sodium (Na)	1.3	1.26	3%	No	0.25	4.92	8.53	54%	No	0.25
Total Sulphur (S)	8.6	8.5	1%	No	3	45.6	78.9	53%	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	38.8	39.3	1%	No	0.5	237	222	7%	No	0.5
Dissolved Metals by ICPMS										
			BDL	No				BDL	No	
Dissolved Aluminum (Al)	0.0291	0.0275	6%	No	0.0005	0.0467	0.0507	8%	No	0.0005
Dissolved Antimony (Sb)	0.000075	0.000074	1%	No	0.00002	0.000228	0.000201	13%	No	0.00002
Dissolved Arsenic (As)	0.000113	0.000114	1%	No	0.00002	0.000055	0.000081	38%	No	0.00002
Dissolved Barium (Ba)	0.0108	0.0107	1%	No	0.00002	0.0162	0.0132	20%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.021	0.018	15%	Yes	0.01
Dissolved Cadmium (Cd)	0.000152	0.000155	2%	No	0.000005	0.000611	0.000505	19%	No	0.000005
Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	0.0001	BDL	Yes	0.0001
Dissolved Cobalt (Co)	0.0000203	0.0000187	8%	No	0.000005	0.000157	0.000119	28%	No	0.000005
Dissolved Copper (Cu)	0.00251	0.00269	7%	No	0.00005	0.00736 (1)	0.00246	BDL	No	0.00005
Dissolved Iron (Fe)	0.0023	0.0021	9%	No	0.001	0.0078	0.0041	62%	No	0.001
Dissolved Lead (Pb)	0.0000896	0.0000788	13%	No	0.000005	0.000525	0.00011	131%	No	0.000005
Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00202	0.00176	14%	No	0.0005
Dissolved Manganese (Mn)	0.000984	0.00101	3%	No	0.00005	0.0146	0.0171	16%	No	0.00005
Dissolved Molybdenum (Mo)	0.000291	0.00027	7%	No	0.00005	0.00045	0.000437	3%	No	0.00005
Dissolved Nickel (Ni)	0.000135	0.000116	15%	No	0.00002	0.000787 (1)	0.000341	BDL	No	0.00002
Dissolved Selenium (Se)	0.00011	0.000108	2%	No	0.00004	0.000406	0.000332	20%	No	0.00004
Dissolved Silicon (Si)	1.22	1.23	1%	No	0.05	2.32	2.14	8%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	0.0000079	BDL	Yes	0.000005
Dissolved Strontium (Sr)	0.0376	0.0378	1%	No	0.00005	0.302	0.279	8%	No	0.00005
Dissolved Thallium (Tl)	<0.0000020	<0.0000020	BDL	No	0.000002	0.0000086	0.0000084	2%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000111	0.0000104	7%	No	0.000002	0.0000176	0.000014	23%	No	0.000002
Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Zinc (Zn)	0.0474	0.0473	0%	No	0.0001	0.119	0.0719	49%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	14	14.2	1%	No	0.05	80	75.2	6%	No	0.05
Dissolved Magnesium (Mg)	0.93	0.918	1%	No	0.05	9.11	8.18	11%	No	0.05
Dissolved Potassium (K)	0.171	0.166	3%	No	0.05	1.2	1.08	11%	No	0.05
Dissolved Sodium (Na)	1.22	1.23	1%	No	0.05	8.56	7.67	11%	No	0.05
Dissolved Sulphur (S)	7.9	8	1%	No	3	75.8	69.5	9%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Duplicates									
Sample ID	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL
Sampling Date	15/10/2018	15/10/2018				20/10/2018	20/10/2018			
Calculated Parameters										
Total Hardness (CaCO3)	341	338	0.008836524	No	0.50	317	318	0.003149606	No	0.50
Total Metals by ICPMS			BDL	No				BDL	No	
Total Aluminum (Al)	0.152	0.141	8%	No	0.0005	0.081	0.082	1%	No	0.0005
Total Antimony (Sb)	0.00076	0.000766	1%	No	0.00002	0.00102	0.00102	0%	No	0.00002
Total Arsenic (As)	0.00017	0.000158	7%	No	0.00002	0.000108	0.000106	2%	No	0.00002
Total Barium (Ba)	0.0172	0.0156	10%	No	0.00002	0.0156	0.0158	1%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	0.023	0.022	4%	No	0.01	0.027	0.027	0%	No	0.01
Total Cadmium (Cd)	0.00112	0.00102	9%	No	0.000005	0.000776	0.00079	2%	No	0.000005
Total Chromium (Cr)	0.00015	0.00011	31%	Yes	0.0001	0.0001	0.00014	33%	Yes	0.0001
Total Cobalt (Co)	0.000414	0.000365	13%	No	0.000005	0.000286	0.000291	2%	No	0.000005
Total Copper (Cu)	0.0193	0.0183	5%	No	0.00005	0.00671	0.00669	0%	No	0.00005
Total Iron (Fe)	0.0953	0.104	9%	No	0.001	0.0165	0.0166	1%	No	0.001
Total Lead (Pb)	0.00251	0.00253	1%	No	0.000005	0.000427	0.000452	6%	No	0.000005
Total Lithium (Li)	0.00273	0.00262	4%	No	0.0005	0.00253	0.00256	1%	No	0.0005
Total Manganese (Mn)	0.0699	0.0635	10%	No	0.00005	0.0498	0.0503	1%	No	0.00005
Total Molybdenum (Mo)	0.00197	0.00193	2%	No	0.00005	0.00349	0.00353	1%	No	0.00005
Total Nickel (Ni)	0.000701	0.000707	1%	No	0.00002	0.000692	0.000735	6%	No	0.00002
Total Selenium (Se)	0.000683	0.000692	1%	No	0.00004	0.000781	0.000782	0%	No	0.00004
Total Silicon (Si)	2.75	2.73	1%	No	0.05	2.98	2.86	4%	No	0.05
Total Silver (Ag)	0.0000081	0.0000089	9%	Yes	0.000005	0.0000107	0.0000124	15%	No	0.000005
Total Strontium (Sr)	0.431	0.396	8%	No	0.00005	0.383	0.383	0%	No	0.00005
Total Thallium (Tl)	0.0000132	0.0000137	4%	No	0.000002	0.0000154	0.0000149	3%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	0.0000249	0.0000241	3%	No	0.000002	0.0000201	0.000019	6%	No	0.000002
Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	0.00021	0.00022	5%	Yes	0.0002
Total Zinc (Zn)	0.268	0.26	3%	No	0.0001	0.212	0.213	0%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	117	117	0%	No	0.05	109	108	1%	No	0.05
Total Magnesium (Mg)	11.9	11.2	6%	No	0.05	11.3	11.4	1%	No	0.05
Total Potassium (K)	2.41	2.42	0%	No	0.05	3.16	3.18	1%	No	0.05
Total Sodium (Na)	14.5	13.8	5%	No	0.05	15.2	15.4	1%	No	0.05
Total Sulphur (S)	115	108	6%	No	3	110	109	1%	No	3
Calculated Parameters			BDL	No				BDL	No	
Dissolved Hardness (CaCO3)	312	311	0%	No	0.5	309	322	4%	No	0.5
Dissolved Metals by ICPMS			BDL	No				BDL	No	
Dissolved Aluminum (Al)	0.0416	0.0417	0%	No	0.0005	0.0185	0.018	3%	No	0.0005
Dissolved Antimony (Sb)	0.000721	0.000713	1%	No	0.00002	0.00103	0.00108	5%	No	0.00002
Dissolved Arsenic (As)	0.000097	0.000092	5%	No	0.00002	0.000086	0.00009	5%	No	0.00002
Dissolved Barium (Ba)	0.0141	0.0143	1%	No	0.00002	0.0156	0.0164	5%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	0.023	0.022	4%	No	0.01	0.025	0.025	0%	No	0.01
Dissolved Cadmium (Cd)	0.000838	0.000848	1%	No	0.000005	0.000769	0.000806	5%	No	0.000005
Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Cobalt (Co)	0.000181	0.000173	5%	No	0.000005	0.000264	0.000265	0%	No	0.000005
Dissolved Copper (Cu)	0.00189	0.00183	3%	No	0.00005	0.00406	0.00365	11%	No	0.00005
Dissolved Iron (Fe)	0.0028	0.002	33%	No	0.001	0.002	0.0011	58%	Yes	0.001
Dissolved Lead (Pb)	0.0000546	0.000101	60%	No	0.000005	0.000122	0.0000769	45%	No	0.000005
Dissolved Lithium (Li)	0.00274	0.00274	0%	No	0.0005	0.00225	0.00237	5%	No	0.0005
Dissolved Manganese (Mn)	0.0318	0.032	1%	No	0.00005	0.0455	0.0468	3%	No	0.00005
Dissolved Molybdenum (Mo)	0.0018	0.00172	5%	No	0.00005	0.00362	0.00369	2%	No	0.00005
Dissolved Nickel (Ni)	0.000435	0.000431	1%	No	0.00002	0.000692	0.000739	7%	No	0.00002
Dissolved Selenium (Se)	0.000655	0.000633	3%	No	0.00004	0.000749	0.000799	6%	No	0.00004
Dissolved Silicon (Si)	2.43	2.45	1%	No	0.05	2.68	2.81	5%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	0.0000152	0.0000139	9%	No	0.000005
Dissolved Strontium (Sr)	0.387	0.394	2%	No	0.00005	0.38	0.404	6%	No	0.00005
Dissolved Thallium (Tl)	0.0000124	0.0000139	11%	No	0.000002	0.0000132	0.000015	13%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	0.00053	BDL	Yes	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000159	0.0000156	2%	No	0.000002	0.0000158	0.0000197	22%	No	0.000002
Dissolved Vanadium (V)	0.00025	0.0002	22%	Yes	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Zinc (Zn)	0.147	0.147	0%	No	0.0001	0.205	0.207	1%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	107	107	0%	No	0.05	106	110	4%	No	0.05
Dissolved Magnesium (Mg)	10.7	11	3%	No	0.05	11	11.3	3%	No	0.05
Dissolved Potassium (K)	2.29	2.3	0%	No	0.05	3.17	3.26	3%	No	0.05
Dissolved Sodium (Na)	13.1	13.4	2%	No	0.05	14.9	15.4	3%	No	0.05
Dissolved Sulphur (S)	103	104	1%	No	3	105	106	1%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Duplicates				
Sample ID	MP-EFF DC	MP-EFF DC D	RPD	Within 2x DL	RDL
Sampling Date	04/11/2018	04/11/2018			
Calculated Parameters					
Total Hardness (CaCO3)	332	332	0	No	0.50
Total Metals by ICPMS			BDL	No	
Total Aluminum (Al)	0.337	0.339	1%	No	0.0005
Total Antimony (Sb)	0.000164	0.000172	5%	No	0.00002
Total Arsenic (As)	0.000121	0.000106	13%	No	0.00002
Total Barium (Ba)	0.0169	0.0169	0%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	<0.010	<0.010	BDL	No	0.01
Total Cadmium (Cd)	0.000652	0.000646	1%	No	0.000005
Total Chromium (Cr)	0.00021	0.00013	47%	Yes	0.0001
Total Cobalt (Co)	0.000112	0.000108	4%	No	0.000005
Total Copper (Cu)	0.0037	0.00363	2%	No	0.00005
Total Iron (Fe)	0.0421	0.0417	1%	No	0.001
Total Lead (Pb)	0.000432	0.000438	1%	No	0.000005
Total Lithium (Li)	0.00247	0.00235	5%	No	0.0005
Total Manganese (Mn)	0.0131	0.0128	2%	No	0.00005
Total Molybdenum (Mo)	0.000668	0.000667	0%	No	0.00005
Total Nickel (Ni)	0.000337	0.000349	3%	No	0.00002
Total Selenium (Se)	0.00077	0.000759	1%	No	0.00004
Total Silicon (Si)	0.632	0.66	4%	No	0.05
Total Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005
Total Strontium (Sr)	0.379	0.381	1%	No	0.00005
Total Thallium (Tl)	0.0000086	0.0000087	1%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	0.00052	<0.00050	BDL	Yes	0.0005
Total Uranium (U)	0.0000157	0.0000142	10%	No	0.000002
Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002
Total Zinc (Zn)	0.0617	0.0629	2%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	126	126	0%	No	0.05
Total Magnesium (Mg)	4.29	4.26	1%	No	0.05
Total Potassium (K)	0.717	0.714	0%	No	0.05
Total Sodium (Na)	4.49	4.57	2%	No	0.05
Total Sulphur (S)	108	107	1%	No	3
Calculated Parameters			BDL	No	
Dissolved Hardness (CaCO3)	322	332	3%	No	0.5
Dissolved Metals by ICPMS			BDL	No	
Dissolved Aluminum (Al)	0.0706	0.0729	3%	No	0.0005
Dissolved Antimony (Sb)	0.000144	0.000152	5%	No	0.00002
Dissolved Arsenic (As)	0.000079	0.000074	7%	No	0.00002
Dissolved Barium (Ba)	0.0155	0.0164	6%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	0.01	0.01	0%	Yes	0.01
Dissolved Cadmium (Cd)	0.000566	0.000592	4%	No	0.000005
Dissolved Chromium (Cr)	0.00012	0.00012	0%	Yes	0.0001
Dissolved Cobalt (Co)	0.0000853	0.0000876	3%	No	0.000005
Dissolved Copper (Cu)	0.0021	0.00187	12%	No	0.00005
Dissolved Iron (Fe)	0.0014	0.0015	7%	Yes	0.001
Dissolved Lead (Pb)	0.000042	0.0000352	18%	No	0.000005
Dissolved Lithium (Li)	0.00244	0.00252	3%	No	0.0005
Dissolved Manganese (Mn)	0.0103	0.0103	0%	No	0.00005
Dissolved Molybdenum (Mo)	0.000617	0.000655	6%	No	0.00005
Dissolved Nickel (Ni)	0.000378	0.000353	7%	No	0.00002
Dissolved Selenium (Se)	0.000655	0.000704	7%	No	0.00004
Dissolved Silicon (Si)	0.586	0.608	4%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.359	0.387	8%	No	0.00005
Dissolved Thallium (Tl)	0.0000087	0.000009	3%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000115	0.0000122	6%	No	0.000002
Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Zinc (Zn)	0.0439	0.0447	2%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	122	126	3%	No	0.05
Dissolved Magnesium (Mg)	4.17	4.37	5%	No	0.05
Dissolved Potassium (K)	0.696	0.726	4%	No	0.05
Dissolved Sodium (Na)	4.43	4.63	4%	No	0.05
Dissolved Sulphur (S)	101	105	4%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

BDL indicates that result is below detection limit

	Duplicates									
Sample ID	MP-EFF DC	MP-EFF DC-D	RPD	Within 2x DL	RDL	MC-TP4-DC	MC-TP4 DC-D	RPD	Within 2x DL	RDL
Sampling Date	2018-12-15	2018-12-15				2018-12-14	2018-12-14			
Analyte										RL
Hardness, Total (as CaCO3)	234	229	2.16%	No	0.5	41.2	39.5	4.21%	No	0.5
Aluminum, dissolved	0.174	0.166	4.71%	No	0.005	0.0392	0.0378	3.64%	No	0.005
Antimony, dissolved	0.00022	0.00023	4.44%	Yes	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Arsenic, dissolved	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Barium, dissolved	0.0169	0.0164	3.00%	No	0.005	0.013	0.0124	4.72%	No	0.005
Beryllium, dissolved	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Bismuth, dissolved	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Boron, dissolved	0.0119	0.0098	19.35%	Yes	0.005	<0.0050	<0.0050	BDL	No	0.005
Cadmium, dissolved	0.000435	0.000425	2.33%	No	0.00001	0.000251	0.000245	2.42%	No	0.00001
Calcium, dissolved	86.8	85.1	1.98%	No	0.2	14.7	14.1	4.17%	No	0.2
Chromium, dissolved	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Cobalt, dissolved	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Copper, dissolved	0.00133	0.00121	9.45%	No	0.0004	0.00683	0.00686	0.44%	No	0.0004
Iron, dissolved	<0.010	<0.010	BDL	No	0.01	<0.010	<0.010	BDL	No	0.01
Lead, dissolved	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Lithium, dissolved	0.00201	0.00196	2.52%	No	0.0001	0.00014	0.00013	7.41%	Yes	0.0001
Magnesium, dissolved	4.18	3.98	4.90%	No	0.01	1.08	1.02	5.71%	No	0.01
Manganese, dissolved	0.00659	0.00642	2.61%	No	0.0002	0.00078	0.00079	1.27%	No	0.0002
Molybdenum, dissolved	0.00068	0.00065	4.51%	No	0.0001	0.00018	0.00019	5.41%	Yes	0.0001
Nickel, dissolved	<0.00040	<0.00040	BDL	No	0.0004	<0.00040	<0.00040	BDL	No	0.0004
Phosphorus, dissolved	<0.050	<0.050	BDL	No	0.05	<0.050	<0.050	BDL	No	0.05
Potassium, dissolved	0.53	0.51	3.85%	No	0.1	0.15	0.14	6.90%	Yes	0.1
Selenium, dissolved	0.00086	0.00076	12.35%	Yes	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Silicon, dissolved	<1.0	<1.0	BDL	No	1	1.2	1.2	0.00%	Yes	1
Silver, dissolved	<0.000050	<0.000050	BDL	No	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Sodium, dissolved	3.07	2.97	3.31%	No	0.1	0.88	0.82	7.06%	No	0.1
Strontium, dissolved	0.27	0.264	2.25%	No	0.001	0.0326	0.0317	2.80%	No	0.001
Sulfur, dissolved	81.6	79.6	2.48%	No	3	7.5	7.8	3.92%	No	3
Tellurium, dissolved	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Thallium, dissolved	<0.000020	<0.000020	BDL	No	0.00002	<0.000020	<0.000020	BDL	No	0.00002
Thorium, dissolved	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Tin, dissolved	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Titanium, dissolved	<0.0050	<0.0050	BDL	No	0.005	<0.0050	<0.0050	BDL	No	0.005
Tungsten, dissolved	<0.0010	<0.0010	BDL	No	0.001	<0.0010	<0.0010	BDL	No	0.001
Uranium, dissolved	<0.000020	<0.000020	BDL	No	0.00002	<0.000020	<0.000020	BDL	No	0.00002
Vanadium, dissolved	<0.0010	<0.0010	BDL	No	0.001	<0.0010	<0.0010	BDL	No	0.001
Zinc, dissolved	0.034	0.0336	1.18%	No	0.004	0.0948	0.0918	3.22%	No	0.004
Zirconium, dissolved	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Aluminum, total	0.311	0.311	0.00%	No	0.005	0.0518	0.048	7.62%	No	0.005
Antimony, total	0.00027	0.00027	0.00%	Yes	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Arsenic, total	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Barium, total	0.019	0.0191	0.52%	No	0.005	0.0132	0.0134	1.50%	No	0.005
Beryllium, total	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Bismuth, total	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Boron, total	0.0174	0.0122	35.14%	No	0.005	<0.0050	<0.0050	BDL	No	0.005
Cadmium, total	0.000548	0.000571	4.11%	No	0.00001	0.00028	0.000272	2.90%	No	0.00001
Calcium, total	99.4	98	1.42%	No	0.2	14.8	15	1.34%	No	0.2
Chromium, total	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Cobalt, total	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Copper, total	0.00413	0.00396	4.20%	No	0.0004	0.007	0.00704	0.57%	No	0.0004
Iron, total	0.037	0.029	24.24%	No	0.01	0.016	0.015	6.45%	Yes	0.01
Lead, total	0.00073	0.00069	5.63%	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Lithium, total	0.00227	0.0023	1.31%	No	0.0001	0.00015	0.00016	6.45%	Yes	0.0001
Magnesium, total	4.75	4.76	0.21%	No	0.01	1.08	1.11	2.74%	No	0.01
Manganese, total	0.0107	0.0105	1.89%	No	0.0002	0.00127	0.0012	5.67%	No	0.0002
Molybdenum, total	0.00089	0.00081	9.41%	No	0.0001	0.00022	0.00019	14.63%	Yes	0.0001
Nickel, total	0.00045	<0.00040	BDL	Yes	0.0004	<0.00040	<0.00040	BDL	No	0.0004
Phosphorus, total	<0.050	<0.050	BDL	No	0.05	<0.050	<0.050	BDL	No	0.05
Potassium, total	0.59	0.59	0.00%	No	0.1	0.14	0.15	6.90%	Yes	0.1
Selenium, total	0.00092	0.00092	0.00%	Yes	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Silicon, total	1.2	1.1	8.70%	Yes	1	1.2	1.3	8.00%	Yes	1
Silver, total	<0.000050	<0.000050	BDL	No	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Sodium, total	3.54	3.51	0.85%	No	0.1	0.86	0.88	2.30%	No	0.1
Strontium, total	0.303	0.298	1.66%	No	0.001	0.0326	0.0329	0.92%	No	0.001
Sulfur, total	102	101	0.99%	No	3	8.8	9.9	11.76%	No	3
Tellurium, total	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Thallium, total	<0.000020	<0.000020	BDL	No	0.00002	<0.000020	<0.000020	BDL	No	0.00002
Thorium, total	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Tin, total	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Titanium, total	<0.0050	<0.0050	BDL	No	0.005	<0.0050	<0.0050	BDL	No	0.005
Tungsten, total	<0.0010	<0.0010	BDL	No	0.001	<0.0010	<0.0010	BDL	No	0.001
Uranium, total	<0.000020	<0.000020	BDL	No	0.00002	<0.000020	<0.000020	BDL	No	0.00002
Vanadium, total	<0.0010	<0.0010	BDL	No	0.001	<0.0010	<0.0010	BDL	No	0.001
Zinc, total	0.0595	0.0573	3.77%	No	0.004	0.102	0.102	0.00%	No	0.004
Zirconium, total	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001

Sample ID	MTB	RDL	11A-RUNOFF FB	RDL	TRIP BLANK	RDL	11A-RUNOFF	11A RUNOFF D	RPD	Within 2x DL	RDL
Sampling Date	16/05/2018		19/09/2018		19/09/2018		2018/02/28 10:10	2018/02/28 10:10			
Misc. Inorganics											
Alkalinity (Total as CaCO3)	<1.0	1	<1.0	1	<1.0	1	26.1	24.9	5%	No	1
Alkalinity (PP as CaCO3)	<1.0	1	<1.0	1	<1.0	1	<1.0	<1.0	BDL	No	1
Bicarbonate (HCO3)	<1.0	1	<1.0	1	<1.0	1	31.8	30.4	5%	No	1
Carbonate (CO3)	<1.0	1	<1.0	1	<1.0	1	<1.0	<1.0	BDL	No	1
Hydroxide (OH)	<1.0	1	<1.0	1	<1.0	1	<1.0	<1.0	BDL	No	1
Physical Properties											
Conductivity	<2.0	2	<2.0	2	<2.0	2	775	766	1%	No	2
pH	5.99		5.34		5.14		7.4	7.53	2%	No	
Physical Properties											
Total Suspended Solids	<4.0	4	<1.0	1	<4.0	4	3.9	4.6	16%	No	1
Calculated Parameters											
Total Hardness (CaCO3)	<0.50	0.5	<0.50	0.5	<0.50	0.5	362	365	1%	No	0.5
Total Metals by ICPMS											
Total Aluminum (Al)	0.00084	0.0005	<0.00050	0.0005	0.00121	0.0005	0.129	0.146	12%	No	0.0005
Total Antimony (Sb)	<0.000020	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.000213	0.000204	4%	No	0.00002
Total Arsenic (As)	<0.000020	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.000062	0.000072	15%	No	0.00002
Total Barium (Ba)	<0.000020	0.00002	<0.000020	0.00002	0.000072	0.00002	0.0142	0.0146	3%	No	0.00002
Total Beryllium (Be)	<0.000010	0.00001	<0.000010	0.00001	<0.000010	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.000050	0.00005	<0.000050	0.00005	0.0000054	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Total Boron (B)	<0.010	0.01	<0.010	0.01	<0.010	0.01	0.023	0.023	0%	No	0.01
Total Cadmium (Cd)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.000137	0.000129	6%	No	0.00005
Total Chromium (Cr)	<0.00010	0.0001	<0.00010	0.0001	<0.00010	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Cobalt (Co)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.0000924	0.0000839	10%	No	0.00005
Total Copper (Cu)	0.000076	0.00005	<0.000050	0.00005	0.000156	0.00005	0.00377	0.00377	0%	No	0.00005
Total Iron (Fe)	<0.0010	0.001	<0.0010	0.001	<0.0010	0.001	0.0184	0.0196	6%	No	0.001
Total Lead (Pb)	<0.000050	0.00005	<0.000050	0.00005	0.00001	0.00005	0.000234	0.000242	3%	No	0.00005
Total Lithium (Li)	<0.00050	0.0005	<0.00050	0.0005	<0.00050	0.0005	0.00281	0.00285	1%	No	0.0005
Total Manganese (Mn)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.0193	0.0192	1%	No	0.00005
Total Molybdenum (Mo)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.000419	0.000449	7%	No	0.00005
Total Nickel (Ni)	<0.000020	0.00002	0.000038	0.00002	0.000002	0.00002	0.000173	0.000188	8%	No	0.00002
Total Selenium (Se)	<0.000040	0.00004	<0.000040	0.00004	<0.000040	0.00004	0.000396	0.000425	7%	No	0.00004
Total Silicon (Si)	<0.050	0.05	<0.050	0.05	<0.050	0.05	2.56	2.56	0%	No	0.05
Total Silver (Ag)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Total Strontium (Sr)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.473	0.474	0%	No	0.00005
Total Thallium (Tl)	<0.0000020	0.000002	<0.0000020	0.000002	<0.0000020	0.000002	0.0000111	0.0000112	1%	No	0.000002
Total Tin (Sn)	<0.00020	0.0002	<0.00020	0.0002	<0.00020	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	0.0005	<0.00050	0.0005	<0.00050	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	<0.0000020	0.000002	<0.0000020	0.000002	<0.0000020	0.000002	0.0000082	0.0000101	21%	No	0.000002
Total Vanadium (V)	<0.00020	0.0002	<0.00020	0.0002	<0.00020	0.0002	0.0013	0.00133	2%	No	0.0002
Total Zinc (Zn)	0.00021	0.0001	0.00018	0.0001	0.00062	0.0001	0.0445	0.278	145%	No	0.0001
Total Zirconium (Zr)	<0.00010	0.0001	<0.00010	0.0001	<0.00010	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	<0.050	0.05	<0.050	0.05	<0.050	0.05	129	130	1%	No	0.05
Total Magnesium (Mg)	<0.050	0.05	<0.050	0.05	<0.050	0.05	9.93	9.82	1%	No	0.05
Total Potassium (K)	<0.050	0.05	<0.050	0.05	<0.050	0.05	1.12	1.13	1%	No	0.05
Total Sodium (Na)	<0.050	0.05	<0.050	0.05	<0.050	0.05	8.16	8.07	1%	No	0.05
Total Sulphur (S)	<3.0	3	<3.0	3	<3.0	3	119	118	1%	No	3
Calculated Parameters											
Dissolved Hardness (CaCO3)	<0.50	0.5	<0.50	0.5	<0.50	0.5	353	351	1%	No	0.5
Dissolved Metals by ICPMS											
Dissolved Aluminum (Al)	<0.00050	0.0005	0.00068	0.0005	<0.00050	0.0005	0.113	0.114	1%	No	0.0005
Dissolved Antimony (Sb)	0.000038	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.000206	0.000202	2%	No	0.00002
Dissolved Arsenic (As)	<0.000020	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.000049	0.000039	23%	Yes	0.00002
Dissolved Barium (Ba)	0.00004	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.0135	0.0135	0%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	0.00001	<0.000010	0.00001	<0.000010	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Dissolved Boron (B)	<0.010	0.01	<0.010	0.01	<0.010	0.01	0.024	0.023	4%	No	0.01
Dissolved Cadmium (Cd)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.0000291	0.0000328	12%	No	0.00005
Dissolved Chromium (Cr)	<0.00010	0.0001	<0.00010	0.0001	<0.00010	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Cobalt (Co)	0.0000059	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.0000104	0.0000113	8%	No	0.00005
Dissolved Copper (Cu)	<0.000050	0.00005	<0.000050	0.00005	0.000154	0.00005	0.000362	0.000398	9%	No	0.00005
Dissolved Iron (Fe)	<0.0010	0.001	<0.0010	0.001	<0.0010	0.001	<0.0010	<0.0010	BDL	No	0.001
Dissolved Lead (Pb)	<0.000050	0.00005	<0.000050	0.00005	0.0000061	0.00005	<0.000050	0.0000311	BDL	No	0.00005
Dissolved Lithium (Li)	<0.00050	0.0005	<0.00050	0.0005	<0.00050	0.0005	0.00276	0.0027	2%	No	0.0005
Dissolved Manganese (Mn)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.00191	0.00218	13%	No	0.00005
Dissolved Molybdenum (Mo)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.000413	0.000427	3%	No	0.00005
Dissolved Nickel (Ni)	<0.000020	0.00002	<0.000020	0.00002	<0.000020	0.00002	0.000048	0.000063	27%	No	0.00002
Dissolved Selenium (Se)	<0.000040	0.00004	<0.000040	0.00004	<0.000040	0.00004	0.0004	0.000389	3%	No	0.00004
Dissolved Silicon (Si)	<0.050	0.05	<0.050	0.05	<0.050	0.05	2.51	2.54	1%	No	0.05
Dissolved Silver (Ag)	<0.000050	0.00005	<0.000050	0.00005	<0.000050	0.00005	<0.000050	<0.000050	BDL	No	0.00005
Dissolved Strontium (Sr)	0.000084	0.00005	<0.000050	0.00005	<0.000050	0.00005	0.495	0.48	3%	No	0.00005
Dissolved Thallium (Tl)	<0.0000020	0.000002	<0.0000020	0.000002	<0.0000020	0.000002	0.0000086	0.0000091	6%	No	0.000002
Dissolved Tin (Sn)	<0.00020	0.0002	<0.00020	0.0002	0.00029	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	0.0005	<0.00050	0.0005	<0.00050	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.000004	0.000002	<0.0000020	0.000002	<0.0000020	0.000002	0.0000055	0.0000057	4%	No	0.000002
Dissolved Vanadium (V)	<0.00020	0.0002	<0.00020	0.0002	<0.00020	0.0002	0.00114	0.0012	5%	No	0.0002
Dissolved Zinc (Zn)	0.0002	0.0001	<0.00010	0.0001	0.00056	0.0001	0.00378	0.00479	24%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	0.0001	<0.00010	0.0001	<0.00010	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	<0.050	0.05	<0.050	0.05	<0.050	0.05	126	125	1%	No	0.05
Dissolved Magnesium (Mg)	<0.050	0.05	<0.050	0.05	<0.050	0.05	9.47	9.58	1%	No	0.05
Dissolved Potassium (K)	<0.050	0.05	<0.050	0.05	<0.050	0.05	1.08	1.09	1%	No	0.05
Dissolved Sodium (Na)	<0.050	0.05	<0.050	0.05	<0.050	0.05	7.82	8.07	3%	No	0.05
Dissolved Sulphur (S)	<3.0	3	<3.0	3	<3.0	3	116	117	1%	No	3

Highlight cells indicate presence of analyte in blank sample

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

Sample ID	BL-GOLD	BL-GOLD DUP	RPD	Within 2x DL	RL	11A-RUNOFF	11A-RUNOFF D	RPD	Within 2x DL	RL
Sampling Date	28/02/2018	28/02/2018				14/03/2018	14/03/2018			
Misc. Inorganics										
Alkalinity (Total as CaCO3)	26.6	27.7	4%	No	1	25.1	22.4	11%	No	1
Alkalinity (PP as CaCO3)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Bicarbonate (HCO3)	32.4	33.8	4%	No	1	30.6	27.3	11%	No	1
Carbonate (CO3)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Hydroxide (OH)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Physical Properties										
Conductivity	57.4	57.1	1%	No	2	71.4	719	1%	No	
pH	7.66	7.67	0%	No		7.5	7.55	1%	No	2
Physical Properties										
Total Suspended Solids			BDL	No		5.10	5.10	BDL	No	1
Calculated Parameters										
Total Hardness (CaCO3)	31.4	27.2	14%	No	0.5	291	300	BDL	No	0.5
Total Metals by ICPMS										
Total Aluminum (Al)	0.0347	0.0247	34%	No	0.003	0.144	0.143	BDL	No	0.0005
Total Antimony (Sb)	0.000024	0.000027	12%	Yes	0.00002	0.000253	0.000256	1%	No	0.00002
Total Arsenic (As)	0.000165	0.000111	39%	No	0.00002	0.000129	0.000148	1%	No	0.00002
Total Barium (Ba)	0.005	0.00426	16%	No	0.00005	0.0159	0.0156	14%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	2%	No	0.00001
Total Bismuth (Bi)	<0.000010	<0.000010	BDL	No	0.00001	<0.000050	<0.000050	BDL	No	0.000005
Total Boron (B)	<0.010	<0.010 (1)	BDL	No	0.01	0.027	0.026	BDL	No	0.01
Total Cadmium (Cd)	0.0000199	0.0000159	22%	No	0.000005	0.000012	0.0000119	4%	No	0.000005
Total Chromium (Cr)	0.00019	0.00011	53%	Yes	0.0001	<0.00010	0.00012	1%	No	0.0001
Total Cobalt (Co)	0.000036	0.000015	82%	Yes	0.00001	0.0000742	0.0000776	BDL	Yes	0.000005
Total Copper (Cu)	0.00115	0.00128 (2)	BDL	No	0.0001	0.00461	0.00475	4%	No	0.00005
Total Iron (Fe)	0.0596	0.0126	120%	No	0.005	0.0532	0.0589	3%	No	0.001
Total Lead (Pb)	0.000051	0.000069	30%	No	0.00002	0.00125	0.00126	10%	No	0.000005
Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00278	0.00258	1%	No	0.0005
Total Manganese (Mn)	0.0146	0.00181	156%	No	0.0001	0.0104	0.0108	7%	No	0.00005
Total Molybdenum (Mo)	0.000172	0.000124	32%	No	0.00005	0.000519	0.000537	4%	No	0.00005
Total Nickel (Ni)	0.000019	<0.000010	BDL	Yes	0.0001	0.000097	0.000187	3%	No	0.00002
Total Selenium (Se)	0.000058	0.000067	14%	Yes	0.00004	0.00051	0.000514	63%	No	0.00004
Total Silicon (Si)	2.13	1.72	21%	No	0.05	3.2	3.01	1%	No	0.05
Total Silver (Ag)	<0.000010	<0.000010	BDL	No	0.00001	0.0000068	0.0000064	6%	No	0.000005
Total Strontium (Sr)	0.0173	0.0134	25%	No	0.00005	0.44	0.461	6%	Yes	0.00005
Total Thallium (Tl)	<0.000020	<0.000020	BDL	No	0.000002	0.0000095	0.0000095	5%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	0%	No	0.0002
Total Titanium (Ti)	<0.0020	<0.0020	BDL	No	0.002	0.00066	0.00072	BDL	No	0.0005
Total Uranium (U)	0.0000207	0.000011	61%	No	0.000005	0.0000065	0.0000074	9%	Yes	0.000002
Total Vanadium (V)	<0.00020	<0.00020	BDL	No	0.00002	0.00096	0.00102	13%	No	0.00002
Total Zinc (Zn)	0.0101	0.0075	30%	No	0.001	0.0351	0.0177	6%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	7%	No	0.0001
Total Calcium (Ca)	10.5	9.53	10%	No	0.25	103	106	BDL	No	0.05
Total Magnesium (Mg)	1.23	0.82	40%	No	0.25	8.47	8.7	3%	No	0.05
Total Potassium (K)	<0.25	<0.25	BDL	No	0.25	1.13	1.18	3%	No	0.05
Total Sodium (Na)	1.26	0.57	75%	No	0.25	8.42	8.57	4%	No	0.05
Total Sulphur (S)	<3.0	<3.0	BDL	No	3	113	114	2%	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	25.3	25	1%	No	0.5	347	344	BDL	No	0.5
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	0.0102	0.0104	2%	No	0.0005	0.11	0.109	BDL	No	0.0005
Dissolved Antimony (Sb)	0.00002	<0.000020	BDL	Yes	0.00002	0.000239	0.00024	1%	No	0.00002
Dissolved Arsenic (As)	0.000116	0.000121	4%	No	0.00002	0.000061	0.00006	0%	No	0.00002
Dissolved Barium (Ba)	0.00373	0.00393	5%	No	0.00002	0.0126	0.0121	2%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	4%	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.028	0.027	BDL	No	0.01
Dissolved Cadmium (Cd)	0.0000176	0.0000202	14%	No	0.000005	0.0000228	0.0000221	4%	No	0.000005
Dissolved Chromium (Cr)	0.0001	<0.00010	BDL	Yes	0.0001	<0.00010	<0.00010	3%	No	0.0001
Dissolved Cobalt (Co)	0.0000084	0.0000081	4%	Yes	0.000005	0.0000083	0.0000085	BDL	No	0.000005
Dissolved Copper (Cu)	0.000194	0.000234	19%	No	0.00005	0.000821	0.0008	2%	Yes	0.00005
Dissolved Iron (Fe)	0.0016	0.0015	6%	Yes	0.001	<0.0010	<0.0010	3%	No	0.001
Dissolved Lead (Pb)	0.0000137	0.0000154	12%	No	0.000005	0.0000348	0.0000272	BDL	No	0.000005
Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00299	0.00289	25%	No	0.0005
Dissolved Manganese (Mn)	0.000656	0.000709	8%	No	0.00005	0.000843	0.000852	3%	No	0.00005
Dissolved Molybdenum (Mo)	0.000064	0.000077	18%	Yes	0.00005	0.000492	0.000522	1%	No	0.00005
Dissolved Nickel (Ni)	0.000044	0.000072	48%	No	0.00002	0.000032	0.000205	6%	No	0.00002
Dissolved Selenium (Se)	0.000047	0.000051	8%	Yes	0.00004	0.000459	0.00049	146%	Yes	0.00004
Dissolved Silicon (Si)	1.51	1.49	1%	No	0.05	2.8	2.71	7%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.000005	<0.0000050	<0.0000050	3%	No	0.000005
Dissolved Strontium (Sr)	0.0116	0.0115	1%	No	0.00005	0.453	0.437	BDL	No	0.00005
Dissolved Thallium (Tl)	<0.000020	<0.000020	BDL	No	0.000002	0.0000075	0.0000091	4%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	19%	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000099	0.0000102	3%	No	0.000002	0.0000037	0.0000031	BDL	No	0.000002
Dissolved Vanadium (V)	0.00028	0.00027	4%	Yes	0.0002	0.0009	0.0009	18%	Yes	0.0002
Dissolved Zinc (Zn)	0.00619	0.00613	1%	No	0.0001	0.00187	0.00166	0%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	12%	No	0.0001
Dissolved Calcium (Ca)	8.8	8.69	1%	No	0.05	126 (1)	124	BDL	No	0.05
Dissolved Magnesium (Mg)	0.795	0.795	0%	No	0.05	7.91	8.6	BDL	No	0.05
Dissolved Potassium (K)	0.062	0.06	3%	Yes	0.05	1.09	1.14	8%	No	0.05
Dissolved Sodium (Na)	0.645	0.627	3%	No	0.05	7.78	8.42	4%	No	0.05
Dissolved Sulphur (S)	<3.0	<3.0	BDL	No	3	110	113	8%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

Sample ID	11A-RUNOFF	11A-RUNOFF D				11A-RUNOFF	11A-RUNOFF D			
Sampling Date	04/04/2018	04/04/2018	RPD	Within 2x DL	RL	02/05/2018	02/05/2018	RPD	Within 2x DL	RL
Misc. Inorganics										
Alkalinity (Total as CaCO3)	16.2	17.4	7%	No	1.0	14.9	16.5	10%	No	1
Alkalinity (PP as CaCO3)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Bicarbonate (HCO3)	19.7	21.3	8%	No	1.0	18.2	20.1	10%	No	1
Carbonate (CO3)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Hydroxide (OH)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Physical Properties										
Conductivity	592	593	0%	No	2.0	624	624	0%	No	2
pH	7.37	7.36	0%	No		7.09	7.18			
Physical Properties										
Total Suspended Solids	4.20	4.50	7%	No	1.0	4.6 (1)	5.4 (1)			1.1
Calculated Parameters										
Total Hardness (CaCO3)	286	286	0%	No	0.50	278	289			0.5
Total Metals by ICPMS										
Total Aluminum (Al)	0.256	0.256	0%	No	0.00050	0.174	0.18	3%	No	0.0005
Total Antimony (Sb)	0.000218	0.000215	1%	No	0.000020	0.000302	0.000302	0%	No	0.00002
Total Arsenic (As)	0.000073	0.000084	14%	No	0.000020	0.000072	0.000073	1%	No	0.00002
Total Barium (Ba)	0.0116	0.0117	1%	No	0.000020	0.0123	0.0125	2%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.000050	<0.000050	BDL	No	0.000050	<0.000050	<0.000050	BDL	No	0.000005
Total Boron (B)	0.023	0.024	4%	No	0.010	0.017	0.018	6%	Yes	0.01
Total Cadmium (Cd)	0.000144	0.000139	4%	No	0.0000050	0.000148	0.000156	5%	No	0.000005
Total Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Total Cobalt (Co)	0.0000925	0.0000863	7%	No	0.0000050	0.000109	0.000113	4%	No	0.000005
Total Copper (Cu)	0.00512	0.00497	3%	No	0.000050	0.00517	0.00529	2%	No	0.00005
Total Iron (Fe)	0.0288	0.0294	2%	No	0.0010	0.0207	0.0208	0%	No	0.001
Total Lead (Pb)	0.000283	0.000303	7%	No	0.0000050	0.000638	0.000567	4%	No	0.000005
Total Lithium (Li)	0.00262	0.00262	0%	No	0.00050	0.002	0.00209	4%	No	0.0005
Total Manganese (Mn)	0.0178	0.0174	2%	No	0.000050	0.0303	0.0313	3%	No	0.00005
Total Molybdenum (Mo)	0.0000483	0.0000463	4%	No	0.000050	0.000406	0.000415	2%	No	0.00005
Total Nickel (Ni)	0.000131	0.000169	25%	No	0.000020	0.000238	0.000257	8%	No	0.00002
Total Selenium (Se)	0.000402	0.00035	14%	No	0.000040	0.000359	0.000333	8%	No	0.00004
Total Silicon (Si)	2.48	2.45	1%	No	0.050	2.6	2.72	5%	No	0.05
Total Silver (Ag)	<0.000050	<0.000050	BDL	No	0.0000050	<0.000050	<0.000050	BDL	No	0.000005
Total Strontium (Sr)	0.377	0.374	1%	No	0.000050	0.355	0.376	6%	No	0.00005
Total Thallium (Tl)	0.0000082	0.0000084	2%	No	0.0000020	0.0000064	0.0000083	26%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.00020	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	0.0000095	0.0000105	10%	No	0.0000020	0.0000111	0.0000107	4%	No	0.000002
Total Vanadium (V)	0.00042	0.00046	9%	No	0.000020	0.00053	0.00056	6%	No	0.0002
Total Zinc (Zn)	0.0457	0.0445	2%	No	0.00010	0.0498	0.051	2%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Total Calcium (Ca)	97.1	97.2	0%	No	0.050	96.3	99.2	4%	No	0.05
Total Magnesium (Mg)	10.5	10.5	0%	No	0.050	9.69	10.1	4%	No	0.05
Total Potassium (K)	1	1	0%	No	0.050	0.995	1.03	3%	No	0.05
Total Sodium (Na)	7.55	7.51	1%	No	0.050	5.77	6.02	4%	No	0.05
Total Sulphur (S)	95.3	94.6	1%	No	3.0	91.7	95	4%	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	263	270	3%	No	0.50	299	295	1%	No	0.5
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	0.202	0.221	9%	No	0.00050	0.167	0.166	1%	No	0.0005
Dissolved Antimony (Sb)	0.000203	0.000215	6%	No	0.000020	0.000293	0.00028	5%	No	0.00002
Dissolved Arsenic (As)	0.000062	0.000065	5%	No	0.000020	0.000046	0.000058	23%	No	0.00002
Dissolved Barium (Ba)	0.0104	0.0105	1%	No	0.000020	0.0114	0.011	4%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.000050	<0.000050	BDL	No	0.0000050	<0.000050	<0.000050	BDL	No	0.000005
Dissolved Boron (B)	0.02	0.022	10%	No	0.010	0.019	0.019	0%	Yes	0.01
Dissolved Cadmium (Cd)	0.0000162	0.0000157	3%	No	0.0000050	0.0000209	0.0000202	3%	No	0.000005
Dissolved Chromium (Cr)	<0.00010	<0.00010	BDL	No	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Cobalt (Co)	0.0000122	0.0000107	13%	No	0.0000050	0.0000274	0.000028	2%	No	0.000005
Dissolved Copper (Cu)	0.000803	0.000775	4%	No	0.000050	0.000949	0.000969	2%	No	0.00005
Dissolved Iron (Fe)	<0.0010	<0.0010	BDL	No	0.0010	<0.0010	0.0018	BDL	Yes	0.001
Dissolved Lead (Pb)	0.0000061	<0.000050	BDL	Yes	0.0000050	0.000011	0.0000109	1%	No	0.000005
Dissolved Lithium (Li)	0.00203	0.00241	17%	No	0.00050	0.00233	0.00224	4%	No	0.0005
Dissolved Manganese (Mn)	0.0026	0.00257	1%	No	0.000050	0.00954	0.00935	2%	No	0.00005
Dissolved Molybdenum (Mo)	0.000459	0.000466	2%	No	0.000050	0.000405	0.000406	0%	No	0.00005
Dissolved Nickel (Ni)	0.000035	0.000048	31%	Yes	0.000020	0.000127	0.000122	4%	No	0.00002
Dissolved Selenium (Se)	0.000391	0.00036	8%	No	0.000040	0.000363	0.000351	3%	No	0.00004
Dissolved Silicon (Si)	2.17	2.1	3%	No	0.050	2.66	2.57	3%	No	0.05
Dissolved Silver (Ag)	<0.000050	<0.000050	BDL	No	0.0000050	<0.000050	<0.000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.361	0.361	0%	No	0.000050	0.367	0.353	4%	No	0.00005
Dissolved Thallium (Tl)	0.0000092	0.0000091	1%	No	0.0000020	0.0000083	0.0000078	6%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.00020	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.00050	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000082	0.0000074	10%	No	0.0000020	0.0000097	0.000011	13%	No	0.000002
Dissolved Vanadium (V)	0.0005	0.00048	4%	No	0.000020	0.00052	0.00057	9%	No	0.0002
Dissolved Zinc (Zn)	0.00294	0.00269	9%	No	0.00010	0.00449	0.00409	9%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.00010	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	89.1	91.9	3%	No	0.050	101	99.3	2%	No	0.05
Dissolved Magnesium (Mg)	9.81	9.81	0%	No	0.050	11.3	11.4	1%	No	0.05
Dissolved Potassium (K)	0.929	0.91	2%	No	0.050	1.02	1.01	1%	No	0.05
Dissolved Sodium (Na)	7.12	7.02	1%	No	0.050	6.82	6.92	1%	No	0.05
Dissolved Sulphur (S)	84.3	84.3	0%	No	3.0	92.3	90.8	2%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

Sample ID	MC-TP4-M	MC-TP4-M D				11A-RUNOFF	11A-RUNOFF D			
Sampling Date	06/06/2018	06/06/2018	RPD	Within 2x DL	RL	11/07/2018	11/07/2018	RPD	Within 2x DL	RL
Misc. Inorganics										
Alkalinity (Total as CaCO3)	7.5	6.4	16%	No	1	23.9	24.2	1%	No	1
Alkalinity (PP as CaCO3)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Bicarbonate (HCO3)	9.2	7.8	16%	No	1	29.2	29.5	1%	No	1
Carbonate (CO3)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Hydroxide (OH)	<1.0	<1.0	BDL	No	1	<1.0	<1.0	BDL	No	1
Physical Properties										
Conductivity	43.9	44	0%	No	2	55.8	55.7	0%	No	2
pH	6.98	6.74	3%	No		7.32	7.28	1%	No	
Physical Properties										
Total Suspended Solids			BDL	No		1.80	1.90	5%	Yes	1
Calculated Parameters										
Total Hardness (CaCO3)	17	16.6	2%	No	0.5	252	253	0%	No	0.5
Total Metals by ICPMS										
Total Aluminum (Al)	0.0539	0.0593	10%	No	0.0005	0.202	0.197	3%	No	0.0005
Total Antimony (Sb)	0.000022	0.000027	20%	Yes	0.00002	0.000357	0.000321	11%	No	0.00002
Total Arsenic (As)	0.000096	0.000132	32%	No	0.00002	0.000133	0.000112	17%	No	0.00002
Total Barium (Ba)	0.00573	0.00502	13%	No	0.00002	0.0163	0.0165	1%	No	0.00002
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.000050	<0.000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Total Boron (B)	<0.010	<0.010	BDL	No	0.01	0.02	0.02	0%	No	0.01
Total Cadmium (Cd)	0.0000271	0.0000255	6%	No	0.000005	0.000658	0.000672	2%	No	0.000005
Total Chromium (Cr)	<0.000010	<0.000010	BDL	No	0.0001	<0.000010	<0.000010	BDL	No	0.0001
Total Cobalt (Co)	0.0000144	0.0000144	0%	No	0.000005	0.000389	0.000391	1%	No	0.000005
Total Copper (Cu)	0.000782	0.00083	5%	No	0.00005	0.0125	0.01250	0%	No	0.00005
Total Iron (Fe)	0.0149	0.0164	14%	No	0.001	0.0312	0.0311	0%	No	0.001
Total Lead (Pb)	0.000157	0.000308	65%	No	0.000005	0.00239	0.00243	2%	No	0.000005
Total Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00218	0.00219	0%	No	0.0005
Total Manganese (Mn)	0.00196	0.00177	10%	No	0.00005	0.103	0.105	2%	No	0.00005
Total Molybdenum (Mo)	0.000217	0.000212	2%	No	0.00005	0.00107	0.00109	2%	No	0.00005
Total Nickel (Ni)	0.000024	0.000031	25%	Yes	0.00002	0.000842	0.000834	1%	No	0.00002
Total Selenium (Se)	<0.000040	<0.000040	BDL	No	0.00004	0.00055	0.00056	2%	No	0.00004
Total Silicon (Si)	0.748	0.687	9%	No	0.05	2.9	2.88	1%	No	0.05
Total Silver (Ag)	<0.000050	<0.000050	BDL	No	0.000005	0.000053	<0.0000050	BDL	Yes	0.000005
Total Strontium (Sr)	0.0154	0.0137	12%	No	0.00005	0.326	0.327	0%	No	0.00005
Total Thallium (Tl)	<0.000020	<0.000020	BDL	No	0.000002	0.0000083	0.0000094	12%	No	0.000002
Total Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Total Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Total Uranium (U)	0.0000177	0.0000212	18%	No	0.000002	0.0000262	0.0000269	3%	No	0.000002
Total Vanadium (V)	<0.00020	0.00027	BDL	Yes	0.0002	0.00024	0.00023	4%	Yes	0.0002
Total Zinc (Zn)	0.00987	0.00894	10%	No	0.0001	0.183	0.184	1%	No	0.0001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	<0.0001
Total Calcium (Ca)	5.97	5.82	3%	No	0.05	84.9	84.8	0%	No	0.05
Total Magnesium (Mg)	0.495	0.496	0%	No	0.05	9.7	9.92	2%	No	0.05
Total Potassium (K)	0.07	0.065	7%	Yes	0.05	1.13	1.14	1%	No	0.05
Total Sodium (Na)	0.7	0.698	0%	No	0.05	7.96	8.03	1%	No	0.05
Total Sulphur (S)	<3.0	<3.0	BDL	No	3	80.8	80.7	0%	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	17.2	17.4	1%	No	0.5	263	261	1%	No	0.5
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	0.0491	0.0502	2%	No	0.0005	0.166	0.16	4%	No	0.0005
Dissolved Antimony (Sb)	0.000047	0.000049	4%	No	0.00002	0.00031	0.000304	2%	No	0.00002
Dissolved Arsenic (As)	0.000150 (1)	0.000142	BDL	No	0.00002	0.000078	0.000079	1%	No	0.00002
Dissolved Barium (Ba)	0.00572	0.00588 (1)	BDL	No	0.00002	0.0156	0.0155	1%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.00001	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.000050	<0.000050	BDL	No	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.01	0.018	0.025	33%	Yes	0.01
Dissolved Cadmium (Cd)	0.0000251	0.0000285	13%	No	0.000005	0.000257	0.000249	3%	No	0.000005
Dissolved Chromium (Cr)	<0.000010	<0.000010	BDL	No	0.0001	<0.000010	<0.000010	BDL	No	0.0001
Dissolved Cobalt (Co)	0.0000183	0.0000115	46%	No	0.000005	0.000215	0.000215	0%	No	0.000005
Dissolved Copper (Cu)	0.00108 (1)	0.000821	BDL	No	0.00005	0.00208	0.00206	1%	No	0.00005
Dissolved Iron (Fe)	0.0117	0.0113	3%	No	0.001	<0.0010	0.0023	BDL	No	0.001
Dissolved Lead (Pb)	0.000300 (1)	0.000256	BDL	No	0.000005	0.000103	0.000128	22%	No	0.000005
Dissolved Lithium (Li)	<0.00050	<0.00050	BDL	No	0.0005	0.00218	0.00222	2%	No	0.0005
Dissolved Manganese (Mn)	0.00154	0.00149	3%	No	0.00005	0.0689	0.0685	1%	No	0.00005
Dissolved Molybdenum (Mo)	0.000233	0.000269	14%	No	0.00005	0.00104	0.00105	1%	No	0.00005
Dissolved Nickel (Ni)	0.000180 (1)	0.000149 (1)	BDL	No	0.00002	0.000641	0.000666	4%	No	0.00002
Dissolved Selenium (Se)	0.00004	<0.000040	BDL	Yes	0.00004	0.000514	0.00051	1%	No	0.00004
Dissolved Silicon (Si)	0.716	0.723	1%	No	0.05	2.51	2.5	0%	No	0.05
Dissolved Silver (Ag)	0.0000056	<0.0000050	BDL	Yes	0.000005	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.0191 (1)	0.0189 (1)	BDL	No	0.00005	0.333	0.323	3%	No	0.00005
Dissolved Thallium (Tl)	<0.000020	<0.000020	BDL	No	0.000002	0.000007	0.0000069	1%	No	0.000002
Dissolved Tin (Sn)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.00050	<0.00050	BDL	No	0.0005	<0.00050	<0.00050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000183	0.0000167	9%	No	0.000002	0.000024	0.0000251	4%	No	0.000002
Dissolved Vanadium (V)	<0.00020	<0.00020	BDL	No	0.0002	<0.00020	<0.00020	BDL	No	0.0002
Dissolved Zinc (Zn)	0.00952	0.00929	2%	No	0.0001	0.0525	0.0495	6%	No	0.0001
Dissolved Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.0001	<0.00010	<0.00010	BDL	No	0.0001
Dissolved Calcium (Ca)	6.09	6.17	1%	No	0.05	88.2	87	1%	No	0.05
Dissolved Magnesium (Mg)	0.473	0.475	0%	No	0.05	10.4	10.5	1%	No	0.05
Dissolved Potassium (K)	0.078	0.072	8%	Yes	0.05	1.17	1.14	3%	No	0.05
Dissolved Sodium (Na)	0.724	0.72	1%	No	0.05	8.53	8.72	2%	No	0.05
Dissolved Sulphur (S)	<3.0	<3.0	BDL	No	3	71.4	76.3	7%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

Sample ID	MC-TP4 M	MC-TP4 MD	RPD	Within 2x DL	RL	11A-RUNOFF	11A-RUNOFF D	RPD	Within 2x DL	RL
Sampling Date	05/09/2018	05/09/2018				10/10/2018	10/10/2018			
Misc. Inorganics										
Alkalinity (Total as CaCO3)	20.5	20.3	1%	No	1.0	24.8	23.2	7%	No	1
Alkalinity (PP as CaCO3)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Bicarbonate (HCO3)	25	24.8	1%	No	1.0	30.2	28.4	6%	No	1
Carbonate (CO3)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Hydroxide (OH)	<1.0	<1.0	BDL	No	1.0	<1.0	<1.0	BDL	No	1
Physical Properties										
Conductivity	221	222	0%	No	2.0	696	695	0%	No	2
pH	7.1	7.08	0%	No		7.27	7.22	1%	No	
Physical Properties										
Total Suspended Solids			BDL	No		8.10	7.9 (1)	BDL	No	1.1
Calculated Parameters										
Total Hardness (CaCO3)	89.7	89.6	0%	No	0.50	303	311	3%	No	0.5
Total Metals by ICPMS										
Total Aluminum (Al)	0.0762	0.0838	9%	No	0.00050	0.37	0.369	0%	No	0.003
Total Antimony (Sb)	0.000077	0.000092	18%	No	0.000020	0.000919	0.00095	3%	No	0.00002
Total Arsenic (As)	0.000144	0.000148	1%	No	0.000020	0.000231	0.000238	3%	No	0.00002
Total Barium (Ba)	0.00989	0.0119	18%	No	0.000020	0.0211	0.0206	2%	No	0.00005
Total Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Total Bismuth (Bi)	<0.000050	<0.000050	BDL	No	0.0000050	<0.000010	<0.000010	BDL	No	0.00001
Total Boron (B)	<0.010	0.01	BDL	Yes	0.010	0.021	0.021	0%	No	0.01
Total Cadmium (Cd)	0.000399	0.000409	2%	No	0.0000050	0.000708	0.000689	3%	No	0.000005
Total Chromium (Cr)	0.0001	<0.00010	BDL	Yes	0.00010	0.00015	0.00015	0%	Yes	0.0001
Total Cobalt (Co)	0.000128	0.000144	12%	No	0.0000050	0.000328	0.000317	3%	No	0.00001
Total Copper (Cu)	0.00907	0.00905	0%	No	0.000050	0.0186	0.01830	2%	No	0.0001
Total Iron (Fe)	0.0296	0.0313	6%	No	0.0010	0.125	0.126	1%	No	0.005
Total Lead (Pb)	0.00258	0.00244	6%	No	0.0000050	0.00153	0.00147	4%	No	0.00002
Total Lithium (Li)	0.00071	0.00067	6%	Yes	0.00050	0.00264	0.00274	4%	No	0.0005
Total Manganese (Mn)	0.0235	0.0231	2%	No	0.000050	0.063	0.0624	1%	No	0.0001
Total Molybdenum (Mo)	0.000388	0.000395	2%	No	0.000050	0.00275	0.00277	1%	No	0.00005
Total Nickel (Ni)	0.000259	0.000225	14%	No	0.000020	0.00049	0.00053	8%	No	0.0001
Total Selenium (Se)	0.000175	0.00019	8%	No	0.000040	0.000829	0.000843	2%	No	0.00004
Total Silicon (Si)	1.55	1.54	1%	No	0.050	2.28	2.31	1%	No	0.05
Total Silver (Ag)	0.0000086	0.0000088	2%	Yes	0.0000050	<0.000010	<0.000010	BDL	No	0.00001
Total Strontium (Sr)	0.105	0.102	3%	No	0.000050	0.43	0.431	0%	No	0.00005
Total Thallium (Tl)	0.000002	<0.0000020	BDL	Yes	0.0000020	0.0000133	0.0000118	12%	No	0.000002
Total Tin (Sn)	<0.000020	<0.000020	BDL	No	0.000020	<0.000020	<0.000020	BDL	No	0.0002
Total Titanium (Ti)	<0.000050	<0.000050	BDL	No	0.000050	<0.00020	<0.00020	BDL	No	0.002
Total Uranium (U)	0.0000177	0.0000163	8%	No	0.0000020	0.0000256	0.0000264	3%	No	0.000005
Total Vanadium (V)	<0.00020	0.00022	BDL	Yes	0.00020	0.00026	0.00029	11%	Yes	0.0002
Total Zinc (Zn)	0.132	0.134	2%	No	0.000010	0.197	0.195	1%	No	0.001
Total Zirconium (Zr)	<0.00010	<0.00010	BDL	No	0.000010	<0.00010	<0.00010	BDL	No	0.00001
Total Calcium (Ca)	31.2	31	1%	No	0.050	108	111	3%	No	0.25
Total Magnesium (Mg)	2.89	2.97	3%	No	0.050	8.34	8.48	2%	No	0.25
Total Potassium (K)	0.358	0.368	3%	No	0.050	3.22	3.29	2%	No	0.25
Total Sodium (Na)	2.71	2.77	2%	No	0.050	15.8	16.2	2%	No	0.25
Total Sulphur (S)	23.5	24.1	3%	No	3.0	109	110	1%	No	3
Calculated Parameters										
Dissolved Hardness (CaCO3)	93.2	93.6	0%	No	0.50	306	307	0%	No	0.5
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	0.0553	0.0465	17%	No	0.00050	0.266	0.268	1%	No	0.0005
Dissolved Antimony (Sb)	0.000068	0.000072	6%	No	0.000020	0.000999	0.000977	2%	No	0.00002
Dissolved Arsenic (As)	0.000123	0.000107	14%	No	0.000020	0.000077	0.000078	1%	No	0.00002
Dissolved Barium (Ba)	0.00895	0.00872	3%	No	0.000020	0.0158	0.0163	3%	No	0.00002
Dissolved Beryllium (Be)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.00001
Dissolved Bismuth (Bi)	<0.0000050	<0.0000050	BDL	No	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Boron (B)	<0.010	<0.010	BDL	No	0.010	0.018	0.018	0%	Yes	0.01
Dissolved Cadmium (Cd)	0.000329	0.000345	5%	No	0.0000050	0.000104	0.000105	1%	No	0.000005
Dissolved Chromium (Cr)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.0001
Dissolved Cobalt (Co)	0.0000618	0.0000542	13%	No	0.0000050	0.0000301	0.0000256	16%	No	0.000005
Dissolved Copper (Cu)	0.0029	0.00429	39%	No	0.000050	0.00141	0.00145	3%	No	0.00005
Dissolved Iron (Fe)	0.0078	0.012	42%	No	0.0010	0.0013	0.0015	14%	Yes	0.001
Dissolved Lead (Pb)	0.000158	0.000286	58%	No	0.0000050	0.0000109	0.0000119	9%	No	0.000005
Dissolved Lithium (Li)	0.00064	0.00072	12%	Yes	0.00050	0.00246	0.00244	1%	No	0.0005
Dissolved Manganese (Mn)	0.0117	0.0114	3%	No	0.000050	0.00605	0.00615	2%	No	0.00005
Dissolved Molybdenum (Mo)	0.000395	0.000401	2%	No	0.000050	0.00267	0.00266	0%	No	0.00005
Dissolved Nickel (Ni)	0.000138	0.000135	2%	No	0.000020	0.000083	0.000082	1%	No	0.00002
Dissolved Selenium (Se)	0.000146	0.000156	7%	No	0.000040	0.000879	0.000865	2%	No	0.00004
Dissolved Silicon (Si)	1.56	1.58	1%	No	0.050	2.12	2.13	0%	No	0.05
Dissolved Silver (Ag)	<0.0000050	<0.0000050	BDL	No	0.0000050	<0.0000050	<0.0000050	BDL	No	0.000005
Dissolved Strontium (Sr)	0.103	0.104	1%	No	0.000050	0.389	0.386	1%	No	0.00005
Dissolved Thallium (Tl)	0.0000027	0.0000029	7%	Yes	0.0000020	0.0000122	0.000011	10%	No	0.000002
Dissolved Tin (Sn)	<0.000020	<0.000020	BDL	No	0.000020	<0.000020	<0.000020	BDL	No	0.0002
Dissolved Titanium (Ti)	<0.000050	<0.000050	BDL	No	0.000050	<0.000050	<0.000050	BDL	No	0.0005
Dissolved Uranium (U)	0.0000126	0.0000132	5%	No	0.0000020	0.0000139	0.000016	14%	No	0.000002
Dissolved Vanadium (V)	<0.00020	0.00021	BDL	Yes	0.00020	0.00021	<0.00020	BDL	Yes	0.0002
Dissolved Zinc (Zn)	0.0894	0.0893	0%	No	0.000010	0.0174	0.018	3%	No	0.0001
Dissolved Zirconium (Zr)	<0.000010	<0.000010	BDL	No	0.000010	<0.000010	<0.000010	BDL	No	0.0001
Dissolved Calcium (Ca)	32.6	32.8	1%	No	0.050	110	110	0%	No	0.05
Dissolved Magnesium (Mg)	2.87	2.86	0%	No	0.050	7.92	7.97	1%	No	0.05
Dissolved Potassium (K)	0.377	0.377	0%	No	0.050	3.24	3.27	1%	No	0.05
Dissolved Sodium (Na)	2.77	2.78	0%	No	0.050	15.5	15.6	1%	No	0.05
Dissolved Sulphur (S)	24	24.2	1%	No	3.0	107	107	0%	No	3

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

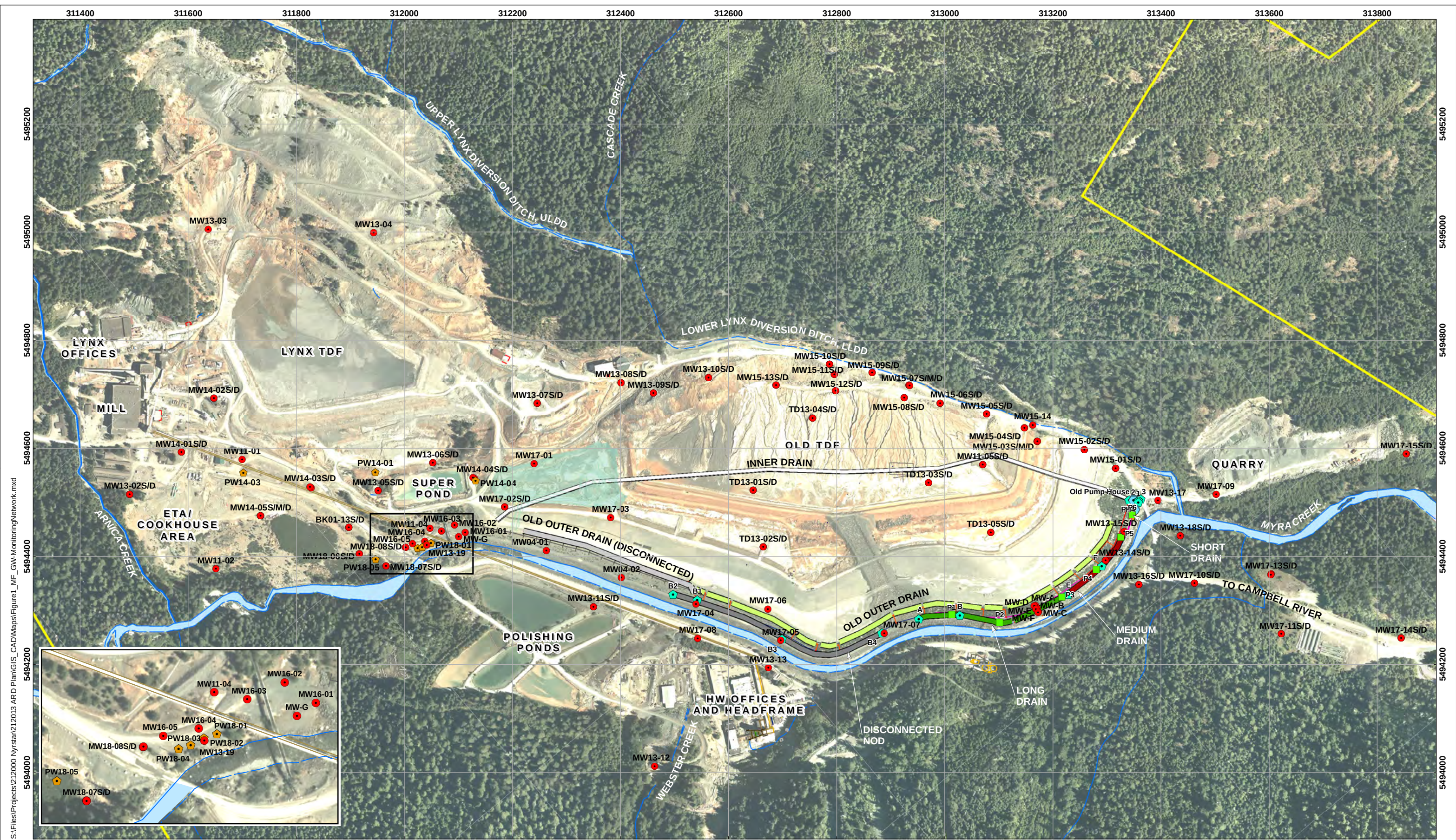
Sample ID	11A-RUNOFF	11A-RUNOFF D	RPD	Within 2x DL	RL
Sample Date	2018-12-12	2018-12-12			
Analyte					
Hardness, Total (as CaCO3)	301	298	1%	No	0.5
Aluminum, dissolved	0.539	0.537	0%	No	0.005
Antimony, dissolved	<0.00020	<0.00020	BDL	No	0.0002
Arsenic, dissolved	<0.00050	<0.00050	BDL	No	0.0005
Barium, dissolved	0.0161	0.0157	3%	No	0.005
Beryllium, dissolved	<0.00010	<0.00010	BDL	No	0.0001
Bismuth, dissolved	<0.00010	<0.00010	BDL	No	0.0001
Boron, dissolved	0.0094	0.0095	1%	Yes	0.005
Cadmium, dissolved	0.000146	0.000137	6%	No	0.00001
Calcium, dissolved	106	105.0	1%	No	0.2
Chromium, dissolved	<0.00050	<0.00050	BDL	No	0.0005
Cobalt, dissolved	0.00013	0.00012	8%	Yes	0.0001
Copper, dissolved	0.00142	0.00129	10%	No	0.0004
Iron, dissolved	<0.010	<0.010	BDL	No	0.01
Lead, dissolved	<0.00020	<0.00020	BDL	No	0.0002
Lithium, dissolved	0.00262	0.00259	1%	No	0.0001
Magnesium, dissolved	8.6	8.58	0%	No	0.01
Manganese, dissolved	0.0661	0.0659	0%	No	0.0002
Molybdenum, dissolved	0.00046	0.00048	4%	No	0.0001
Nickel, dissolved	<0.00040	<0.00040	BDL	No	0.0004
Phosphorus, dissolved	<0.050	<0.050	BDL	No	0.05
Potassium, dissolved	0.69	0.68	1%	No	0.1
Selenium, dissolved	0.00058	0.00057	2%	Yes	0.0005
Silicon, dissolved	<1.0	<1.0	BDL	No	1
Silver, dissolved	<0.000050	<0.000050	BDL	No	0.00005
Sodium, dissolved	4.02	3.97	1%	No	0.1
Strontium, dissolved	0.337	0.331	2%	No	0.001
Sulfur, dissolved	108	108	0%	No	3
Tellurium, dissolved	<0.00050	<0.00050	BDL	No	0.0005
Thallium, dissolved	<0.000020	<0.000020	BDL	No	0.00002
Thorium, dissolved	<0.00010	<0.00010	BDL	No	0.0001
Tin, dissolved	<0.00020	<0.00020	BDL	No	0.0002
Titanium, dissolved	<0.0050	<0.0050	BDL	No	0.005
Tungsten, dissolved	<0.0010	<0.0010	BDL	No	0.001
Uranium, dissolved	0.000031	0.000032	3%	Yes	0.00002
Vanadium, dissolved	<0.0010	<0.0010	BDL	No	0.001
Zinc, dissolved	0.0107	0.0102	5%	No	0.004
Zirconium, dissolved	<0.00010	<0.00010	BDL	No	0.0001
Alkalinity, Total (as CaCO3)	20.9	20.1	4%	No	1
Alkalinity, Phenolphthalein (as CaCO3)	<1.0	<1.0	BDL	No	1
Alkalinity, Bicarbonate (as CaCO3)	20.9	20.1	4%	No	1
Alkalinity, Carbonate (as CaCO3)	<1.0	<1.0	BDL	No	1
Alkalinity, Hydroxide (as CaCO3)	<1.0	<1.0	BDL	No	1
Solids, Total Suspended	9.2	7	27%	No	2
pH	7.57	7.62	1%	No	0.1
Conductivity (EC)	641	636	1%	No	2
Aluminum, total	0.646	0.625	3%	No	0.005
Antimony, total	0.00035	0.00026	30%	Yes	0.0002
Arsenic, total	<0.00050	<0.00050	BDL	No	0.0005
Barium, total	0.027	0.0274	1%	No	0.005
Beryllium, total	<0.00010	<0.00010	BDL	No	0.0001
Bismuth, total	<0.00010	<0.00010	BDL	No	0.0001
Boron, total	0.0159	0.0147	8%	No	0.005
Cadmium, total	0.00106	0.00106	0%	No	0.00001
Calcium, total	118	113	4%	No	0.2
Chromium, total	<0.00050	<0.00050	BDL	No	0.0005
Cobalt, total	0.00043	0.0004	7%	No	0.0001
Copper, total	0.0268	0.0263	2%	No	0.0004
Iron, total	0.29	0.29	0%	No	0.01
Lead, total	0.00979	0.0101	3%	No	0.0002
Lithium, total	0.00283	0.00269	5%	No	0.0001
Magnesium, total	9.01	8.63	4%	No	0.01
Manganese, total	0.111	0.105	6%	No	0.0002
Molybdenum, total	0.0005	0.00049	2%	No	0.0001
Nickel, total	0.0008	0.00083	4%	No	0.0004
Phosphorus, total	<0.050	<0.050	BDL	No	0.05
Potassium, total	0.64	0.61	5%	No	0.1
Selenium, total	0.00061	0.00059	3%	Yes	0.0005
Silicon, total	1	<1.0	BDL	Yes	1
Silver, total	<0.000050	<0.000050	BDL	No	0.00005
Sodium, total	4.08	3.91	4%	No	0.1
Strontium, total	0.351	0.338	4%	No	0.001
Sulfur, total	113	106	6%	No	3
Tellurium, total	<0.00050	<0.00050	BDL	No	0.0005
Thallium, total	<0.000020	<0.000020	BDL	No	0.00002
Thorium, total	<0.00010	<0.00010	BDL	No	0.0001
Tin, total	<0.00020	<0.00020	BDL	No	0.0002
Titanium, total	<0.0050	<0.0050	BDL	No	0.005
Tungsten, total	<0.0010	<0.0010	BDL	No	0.001
Uranium, total	0.000054	0.000053	2%	No	0.00002
Vanadium, total	<0.0010	<0.0010	BDL	No	0.001
Zinc, total	0.206	0.203	1%	No	0.004
Zirconium, total	<0.00010	<0.00010	BDL	No	0.0001

Indicates a Relative Percent Difference greater than 10%

Indicates a Relative Percent Difference greater than 20%

Appendix H

Sampling Station Maps



Legend

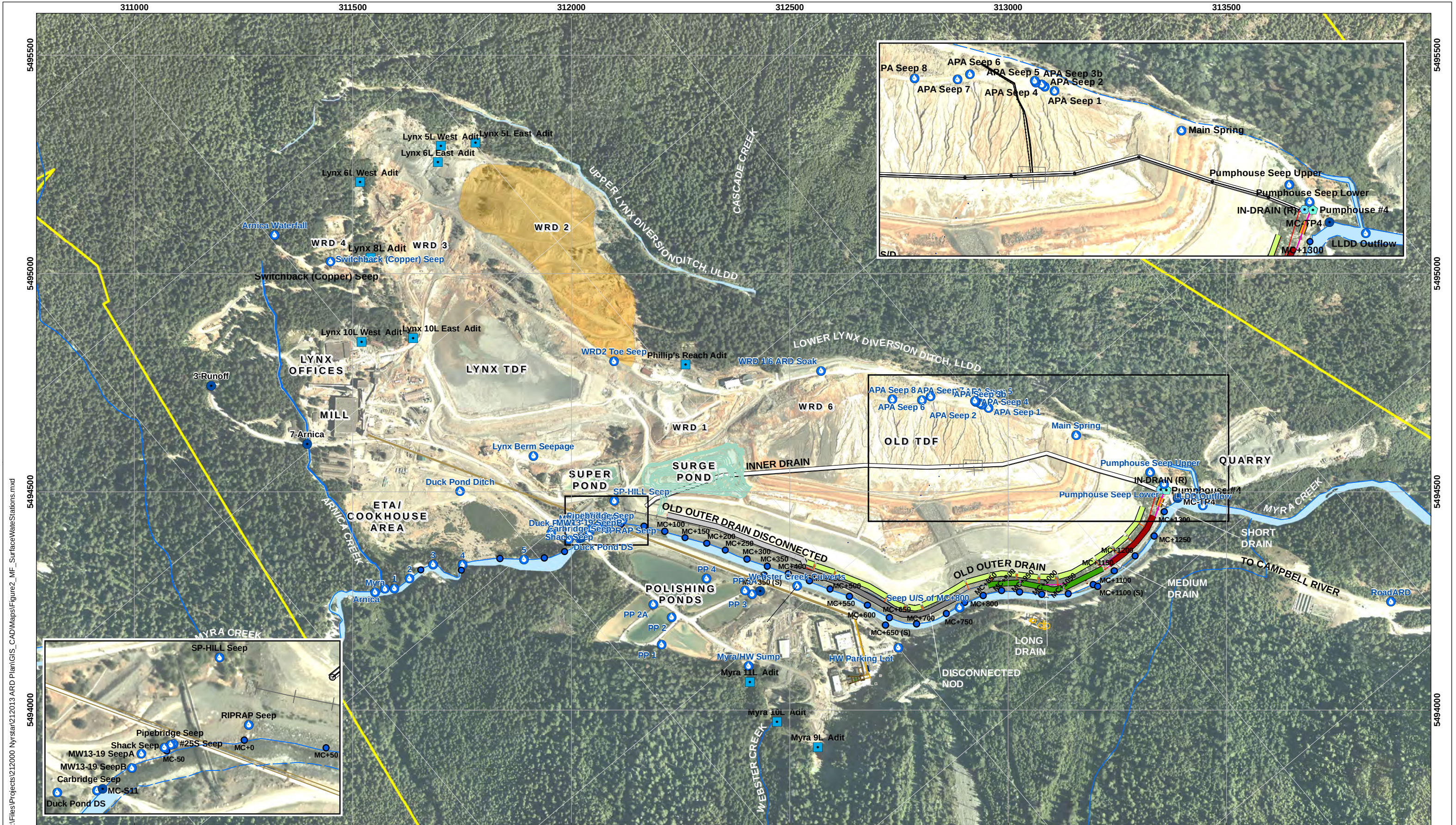
- Monitoring Well
- Pumping Well
- Standpipe
- Riser
- Drain
- Class B Park Boundary



Scale 1:6,500
0 50 100 200 300 400 500 Meters



Client: nyrstar	Figure: 1
Project: Water Monitoring Plan	Last Update: Jan 17, 2019
Report: RGC 212013/	Drawn: L.R
Original File: Figure1_MF_GW-MonitoringNetwork.mxd	



S:\Files\Projects\212000 Nyrstar\212013 ARD Plan\GIS_CAD\Map\Figure2_MF_SurfaceWaterStations.mxd

Surface Water Monitoring Stations and Seep Locations, Nyrstar Myra Falls

Legend

Drain Sample

Creek Monitoring Station

Surface Water Station

Seep or Surface Water

Adit (Mine Water)

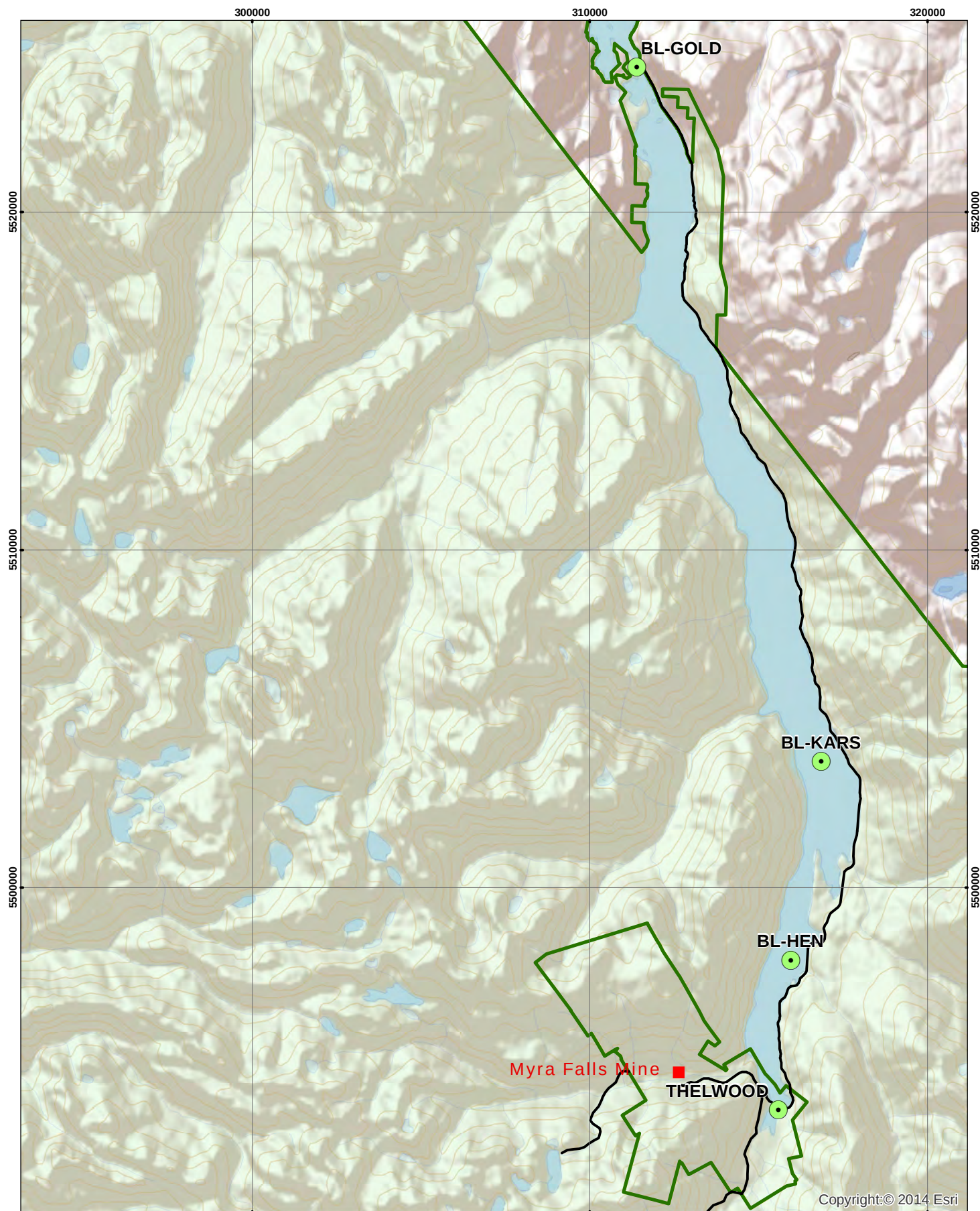
Class B Park Boundary

Scale 1:7,000
0 50 100 200 300 400 500 Meters

NAD83 UTM Zone10N

Client: nyrstar	Figure: 2
Project: Water Monitoring Plan	Last Update: Jan 17, 2019
Report: RGC 212011/7	Drawn: L.R.
Original File: Figure2_MF_SurfaceWaterStations.mxd	

S:\Files\Projects\212000 Nyrstar\212013 ARD Plan\GIS_CAD\Maps\Figure3_MF_SWS_ButtieLake.mxd



Surface Water Monitoring Stations

Myra Falls, BC, Canada

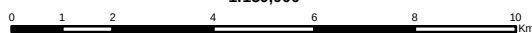
1:150,000

Projection: NAD 1983 UTM Zone 10N



Legend

- Surface Water Station
- Class B Park Boundary



Client: nyrstar	Figure: 3
Project: Water Monitoring Plan	Last Update: Jan 18, 2019
Report: RGC 212013/	Drawn: L.R.
Original File: Figure3_MF_SWS_ButtieLake.mxd	



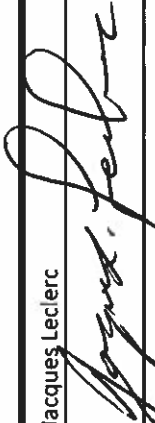
Annual Status Form

AUTHORIZATION NUMBER: 6858

AUTHORIZATION TYPE: Effluent, Permit

LEGAL AUTHORIZATION HOLDER NAME: Nyrstar Myra Falls Ltd.

AUTHORIZED PERSON NAME: Jacques Leclerc

AUTHORIZED PERSON SIGNATURE: 

SIGNATURE DATE: March 29, 2019

*I understand that it is an offense to mislead a government official, and I declare that all of the information presented is accurate and true.
I am an employee, representative or contractor who has been given the authority by the authorization holder to sign this statement.*

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.1.1	The authorized rates of discharge are a daily maximum of 8,000 m ³ /d and an annual average of 4,250 m ³ /d.	Yes	NA
1.1.2	The characteristics of the discharge must be equivalent to or better than typical thickened mill tailings slurry, typical paste tailings and tailings sand, typical solids from water treatment ponds and domestic type sewage treatment plant sludge.	Yes	NA
1.1.4	The works authorized must be complete and in operation according to the following schedule	Yes	NA

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.2.1	The authorized rates of discharge is an annual average of 48,000 m3/day. During heavy precipitation events, the permittee must immediately notify the Director if a discharge in excess of 110,000 m3/day occurs, and include in the following monthly report the dates when flows were above 110, 000 m3/day. When the discharge is in excess of 110,000 m3/day occurs, the allowable total suspended solids (section 1.2.2) will be increased from 25 to 50 mg/L. The Director may from time to time limit the maximum outflow based upon actual on-site measurements.	Yes	NA - SEE APPENDIX A IN ANNUAL REPORT, Jan 21, 2018 EXCEEDED 110,000 CUBIC METERS PER DAY
1.2.2	The characteristics of the discharge must not exceed: Total Suspended Solids 25mg/L * pH 6.5 to 10 pH units Total Cu 0.60mg/L Dissolved Cu 0.20 mg/L Total Zn (maximum) 1.0 mg/L Dissolved Zn 0.50 mg/L Dissolved Cd 0.005 mg/L Dissolved Pb 0.05 mg/L Toxicity (96 hr LC50) 100% * A total suspended solids level of up to 50 mg/L is allowed for discharges in excess of 110 000 m3/d. The characteristics of the domestic type sewage treatment plant effluent at the sampling points identified as Myra STP and HW STP on the attached Site Plan A must not exceed: 5 day Biochemical Oxygen Demand 45 mg/L Total Suspended Solids 60 mg/L	No	Sewage treatment samples collected in March, April, and June exceeded limit at Myra STP. Results and subsequent actions discussed in Annual Water Quality Report.
1.3.1	The authorized rates of discharge are a daily maximum of 5,400 m3/d and an annual average of 3,450 m3/d.	Yes	NA

Authorized Person Initial: _____

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.3.2	The characteristics of the discharge as measured at the northwest side of Price Pond #2 must not exceed:	Yes	NA - APPENDIX D IN ANNUAL REPORT
2.4.2	A minimum freeboard of 0.60 m must be maintained at all times. If at any time the freeboard in the treatment ponds is reduced to less than 0.6 metres, the Permittee must notify the Director immediately. After initial reporting of such an occurrence, the Permittee must report the freeboard weekly until such time as the required freeboard is re-established.	No	Freeboard below 60 cm was observed in Myra 4A for 23 weekly observations. Staff gauges were re-surveyed and replaced in December 2018 and it was found the previous staff gauge was inaccurate. Details provided in quarterly water quality reports
2.4.3	Sludges and solids must be removed from the treatment ponds on a regular basis and may be disposed of within the areas authorized by Subsection 1.1 provided that the location and method of disposal are acceptable to the Director.	Yes	Sludge was removed regularly from Superpond throughout 2018
2.5	In the event that a discharge is anticipated from any emergency spillway associated with the Area 1 or Area 2 tailings impoundment structures, the permittee must immediately notify the Director. The details of any emergency spillway discharge must be recorded and a report forwarded to the Director within 30 days of the incident. The Director may allow tailings deposition to the tailings area not affected by a spillway discharge.	Yes	NA - NO DISCHARGES OCCURRED

Authorized Person Initial: _____



Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
2.7	The permittee is required to maintain a current operations manual for the treatment works authorized by Subsections 1.1.3 and 1.2.3. The manual should be updated at least on an annual basis or as needed, taking into consideration new information including non-compliances, and include procedures to be followed on a day-to-day basis as well as during upset or emergency conditions. Staff must be trained on the manual and associated procedures. The operations manual must be submitted to the satisfaction of the Director a minimum of 30 days before discharge commences. The operations manual must be modified as required by the Director Under normal operation conditions, decanted effluent from the tailings impoundment area (authorized by Subsection 1.1) must be collected and treated in the works authorized by Subsection 1.2 prior to discharge to Myra Creek. During periods of extreme precipitation runoff, the decant from the tailings impoundment may be discharged directly to Myra Creek subject to the following conditions:	Yes	OMS updated in March of 2018 and Currently being updated for 2019
2.8	Under normal operation conditions, effluent from the tailings impoundment area outer drain (authorized by Subsection 1.1) must be collected and treated in the works authorized by Subsection 1.2 prior to discharge to Myra Creek. The permittee may discharge effluent from the upstream portion of the outer drain directly to Myra Creek subject to the following conditions:	YES	NO DISCHARGES DIRECTLY TO THE CREEK
2.9	MONITORING REQUIREMENTS	Yes	NO DISCHARGES DIRECTLY TO THE CREEK Daily samples missed at MC-TP4 for: Mar 27. Daily Flow data lost from May 16-23. See Annual report for further details
3		No	

Authorized Person Initial: _____

Date: March 29th 2019



Annual Status Form

AUTHORIZATION NUMBER: 6858

AUTHORIZATION TYPE: Effluent, Permit

LEGAL AUTHORIZATION HOLDER NAME: Nyrstar Myra Falls Ltd.

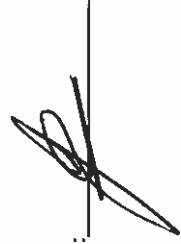
AUTHORIZED PERSON NAME: Jacques Leclerc

AUTHORIZED PERSON SIGNATURE: 

SIGNATURE DATE: March 29, 2019

*I understand that it is an offense to mislead a government official, and I declare that all of the information presented is accurate and true.
I am an employee, representative or contractor who has been given the authority by the authorization holder to sign this statement.*

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.1.1	The authorized rates of discharge of tailings slurry is 8,000 m ³ /day	Yes	NA
1.1.2	The average annual authorized rate of discharge of tailings slurry is 4,250 m ³ /day	Yes	NA
1.1.7	The works authorized must be complete and in operation according to the following schedule	Yes	NA
1.2.1	The average annual authorized rate of discharge of effluent is 48,000 m ³ /day	Yes	NA

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.2.3	The characteristics of the discharge at the sampling point located after the final Myra Pond (MP-EFF), as shown in the attached Figure 2, must be not exceed the following effluent discharge limits: Total Suspended Solids 25mg/L for discharge rates $\leq 110,000$ m ³ /day, 50 mg/L for discharge rates $\geq 110,000$ m ³ /day pH 6.5 to 10 pH units Total Cu 0.60mg/L Dissolved Cu 0.20 mg/L Total Zn 1.0 mg/L Dissolved Zn 0.50 mg/L Dissolved Cd 0.005 mg/L Dissolved Pb 0.05 mg/L Toxicity RBT 96 hr Acute Lethality, Single Concentration Test 50% survival in 100% Effluent Concentration	No	As reported in quarterly and annual reports
1.2.5	The authorized works must be completed and operational while discharging.	Yes	
1.3.3	The characteristics of the discharge at the sampling points Myra STP and HW STP, as shown on the attached Figure 2, must not exceed the following Effluent discharge limits: 5 day Biochemical Oxygen Demand 45 mg/L Total Suspended Solids 60 mg/L	No	As reported in quarterly and annual reports
1.3.5	The authorized works must be completed and operational while discharging.	Yes	
1.4.1	The maximum authorized rate of discharge of effluent is 5,400 m ³ /day.	Yes	
1.4.2	The average annual authorized rate of discharge of effluent is 3,450 m ³ /day.	Yes	
1.4.4	The characteristics of the discharge at the sampling point identified as the Price Mine exfiltration pond (PR-13L) must not exceed the following discharge limits: Total Suspended solids 25 mg/L pH 6.5-8.5 Total Copper 0.6 mg/L Dissolved Copper 0.2 mg/L Total Zinc 1 mg/L Dissolved Zinc 0.5 mg/L Dissolved Cadmium 0.005 mg/L Dissolved Lead 0.05 mg/L	Yes	
1.4.6	The authorized works must be completed and operational while discharging.	Yes	

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
1.5.3	The characteristics of the decanted effluent (TDF-EFF) must not exceed the following discharge limits: Total Suspended Solids 20 mg/L Total Copper 0.3 mg/L Dissolved Copper 0.1 mg/L Total Zinc 0.5 mg/L Dissolved Zinc 0.25 mg/L Dissolved Cadmium 0.003 mg/L Toxicity RBT 96 hr Acute Lethality, Single Concentration Test 50% survival in 100% Effluent Concentration Qualified Professional - All documents submitted to the Director must be signed by the author. Submissions where an opinion or recommendation is expressed regarding data analysis, interpretation, assessment and/or design must be signed by an appropriate Qualified Professional, who in doing so takes professional responsibility for the content of the document. A Qualified Professional is defined as follows: "Qualified Professional" means an applied scientist or technologist specializing in an applied science or technology applicable to the duty or function including, but not limited to agronomy, biology, forestry, chemistry, engineering, geoscience, geology or hydrogeology, and who: a) is registered in good standing with the appropriate professional organization, is acting under that organization's code of ethics and is subject to disciplinary action by that organization, and b) Through suitable education, experience, accreditation and knowledge, may be reasonably relied on to provide advice within their area of expertise.	Yes	NA - No discharges Occurred
2.1		Yes	

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
2.2	The Permittee must inspect the authorized works on a weekly basis and maintain them in good working order. In the event of an emergency or condition beyond the control of the Permittee which prevents effective operation of the Authorized Works or leads to an unauthorized discharge, the Permittee must take remedial action to restore the effective operation of the Authorized Works and to prevent any unauthorized discharges. The Permittee must immediately report the emergency or condition, and the remedial action that has and will be taken. To report a spill, the Permittee must call 1-800-663-3456 and follow the Spill Reporting Regulation. The Director may require the Permittee to reduce or suspend operations until the Authorized Works have been restored, and/or corrective steps have been taken to prevent unauthorized discharges.	Yes	
2.3	The Permittee must not allow any discharge authorized by this authorization to bypass the authorized works, except with the prior written approval of the Director. The Director must be notified prior to implementing changes to any process that may adversely affect the quality and/or quantity of the discharge. Despite notification under this section, permitted levels must not be exceeded.	No	As reported in quarterly and annual reports
2.4	In the event of an emergency spillway discharge from the Lynx TDF and/or Old TDF areas, the Permittee must immediately notify the Director and respond to the discharge as outlined in the most recent version of the Unauthorized Discharge Plan. The notification and reporting of the unauthorized discharge from the spillways must follow the requirements outlined in the Subsections 4.1.2 and 4.1.3.	Yes	NA - No discharges Occurred

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
2.6	The Permittee is required to maintain a current Discharge Operations Manual for the treatment works authorized by Section 1. The manual should be updated at least on an annual basis or more frequently if needed, taking into consideration new information including non-compliances, and include procedures to be followed on a day-to-day basis as well as during upset or emergency conditions. Staff must be trained on the manual and associated procedures. The most recent version of the manual must be implemented while discharging. The operations manual must be modified as required by the Director.	Yes	OMS Manual updated in March 2018, being updated for 2019
3	Monitoring Requirements	No	As reported in quarterly and annual reports
4.1	The Permittee must maintain data of field measurements, flow measurements, effluent, water and bioassay analyses, and quality assurance data for inspection and submit the data quarterly, suitably tabulated, to the Director. All reports must be submitted within 30 days of the end of each three month period during which the data was collected. In the event that any monitoring requirement stipulated in this permit is not met the Permittee must document the occurrence and provide an explanation for the omission in the quarterly report for that period. The Permittee must submit all data required to be submitted under this section by email to the Ministry's Routine Environmental Reporting Submission Mailbox at EnvironmentalReporting@gov.bc.ca.	Yes	

Authorized Person Initial: 

Date: March 29th 2019

CONDITION NUMBER	CONDITION DESCRIPTION	COMPLIANT (Yes/No)	ACTION TAKEN
4.2	The Permittee must immediately notify the Director by email at EnvironmentalCompliance@gov.bc.ca of any non-compliance with the requirements of this authorization and take remedial action to remedy any effects of such non-compliance. The Permittee must provide the Director with written confirmation of all such non-compliance events, including available test results within 24 hours of the original notification by email. If the Permittee fails to comply with any of the requirements of this authorization, the Permittee must, within 30 days of such non-compliance, submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following a) all relevant test results related to the non-compliance; b) an explanation of the most probable cause(s) of the non-compliance; and c) a description of remedial action planned and/or taken to prevent similar non-compliance in the future. The Permittee must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Compliance Reporting Submission Mailbox at EnvironmentalCompliance@gov.bc.ca.	Yes	

Authorized Person Initial: _____



Date: March 29th 2019