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Long-Term Maintenance and Monitoring
Semi-Annual Surface Water Quality Monitoring Program Fall 2021

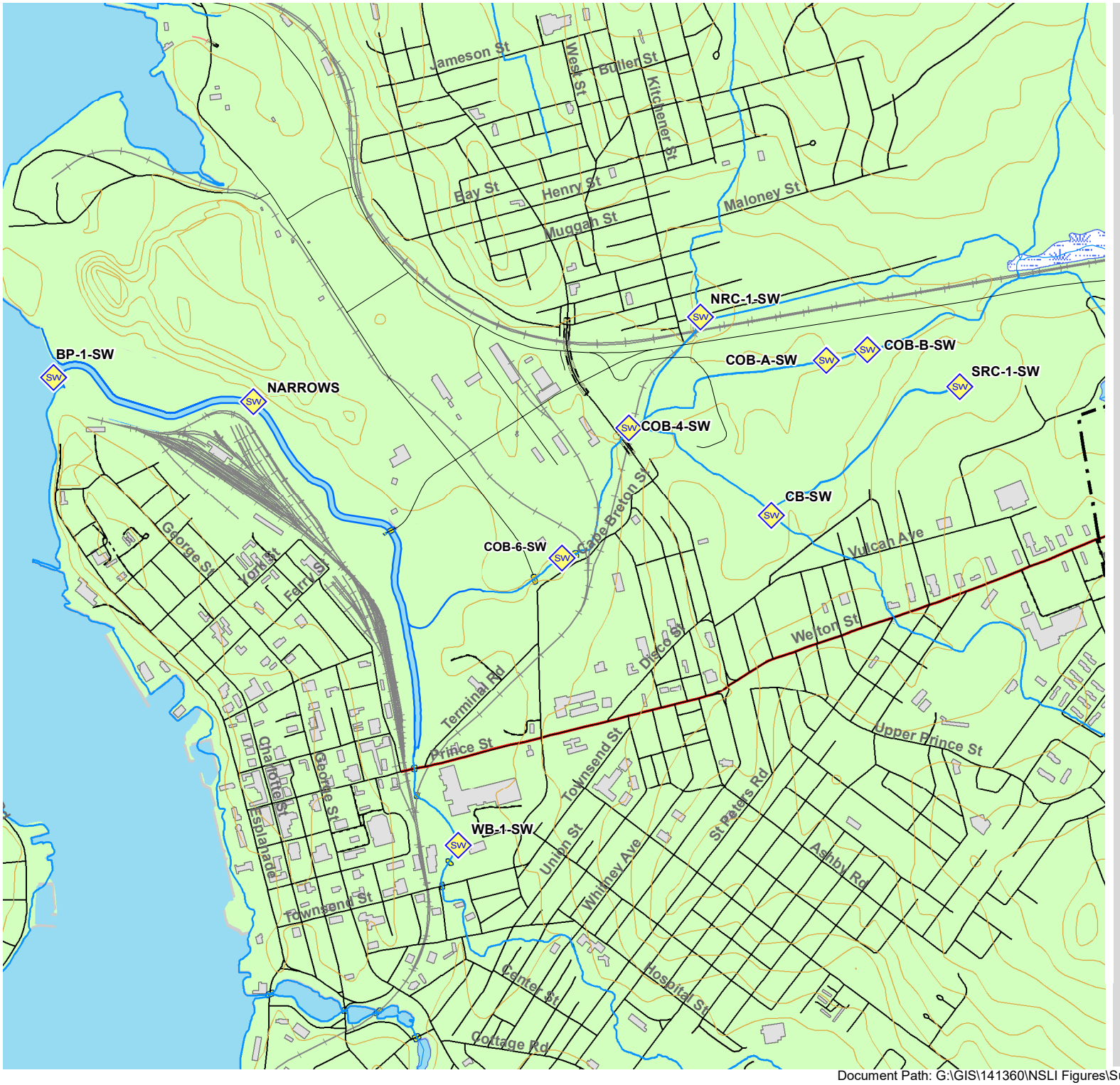
Following completion of the Sydney Tar Ponds and Coke Ovens Remediation Project, surface water quality monitoring was implemented as part of a long-term maintenance and monitoring (LTMM) program to provide ongoing data and compliance commitments to regulatory agencies and/or stakeholders. Nova Scotia Lands Inc. ("NSLI") is a Crown Corporation of the Province of Nova Scotia responsible for the LTMM semi-annual surface water quality program. NSLI retained Dillon Consulting Limited ("Dillon") to conduct the Fall 2021 LTMM Surface Water Quality Monitoring Program, the details of which are provided herein.

Project Methodology

The Fall 2021 Surface Water Quality Monitoring Program, which was completed on December 16, 2021, included the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) (see Figure 1).

A GPS unit was used to confirm that the monitoring locations sampled as part of the Fall 2021 LTMM surface water quality monitoring program were the same as those used during historical surface water monitoring events (i.e., historical LTMM events and the Environmental Effects Monitoring and Surface Water Monitoring (EEMSWM) Program associated with the Sydney Tar Ponds remediation and past LTMM program events). Tasks associated with the Fall 2021 Surface Water Monitoring Program included:

- Documenting ecological activity in the surface water bodies, if observed;
- Recording physical conditions and potential contaminants (i.e., debris, precipitate);
- Measurement of field parameters (i.e., pH, conductivity, temperature, salinity and turbidity);
- Flow calculation;



NS Lands
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LONG TERM MAINTENANCE
AND MONITORING
SURFACE WATER QUALITY MONITORING PROGRAM
Fall 2021

SURFACE WATER LOCATIONS FALL 2021

FIGURE 1

SW Surface Water Locations

0 100 200 400 600 m

MAP DRAWING INFORMATION:
Province of Nova Scotia Mapping

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

DILLON CONSULTING

PROJECT: 20-2862

Date: 2022-01-04

Document Path: G:\GIS\141360\NSLI Figures\Surface Water\Figure 1 Surface Water December 2021.mxd

- Collection of two surface water samples (i.e., COB-4-SW and COB-6-SW) for polycyclic aromatic hydrocarbon (PAH) analysis. Of note, following completion of the Fall 2020 surface water sampling event, it was recommended that PAH analysis be removed from the program as review of historical data and select PAH indicator parameters indicated that PAH exceedances potentially related to remediation activities, or the site, had not been observed since 2016. NSLI, under the direction of Nova Scotia Environment (NSE), approved removal of PAH analysis from eight of the ten sampling locations, noting that two (i.e., COB-4-SW and COB-6-SW) of the locations should continue to be sampled for PAHs due to their location downstream of a water treatment plant outfall; and,
- Collection of ten surface water samples for general chemistry and total metals (including mercury) (RCApMS) analysis.

A summary of the surface water stations included in the Fall 2021 monitoring program is presented in Table 1.

Table 1: **Surface Water Quality Monitoring Stations**

Monitoring Station ID	Water Body	Rationale for Sampling
CB-SW	Cagney Brook	To characterize surface water quality within the urban area of Sydney upstream of CO7/CO8[1].
NRC-1-SW	North Realigned Channel	To characterize surface water quality within the urban area of Whitney Pier upstream of CO7/CO8.
SRC-1-SW	South Realigned Channel	To characterize surface water quality related to runoff from the municipal landfill upstream of CO7/CO8.
COB-A-SW	Coke Ovens Brook - concrete riffles upstream of Stable Drive	To characterize surface water quality from runoff and leachate associated with the municipal landfill upstream of CO1[2], CO6[3] and CO7/CO8.
COB-B-SW[4]	Coke Oven Brook along SPAR Road, east of COB-A-SW	To further characterize the potential for impacts from the municipal landfill to COB-A-SW.
COB-4-SW	COB-A-SW	To characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B[5].

Table 1: **Surface Water Quality Monitoring Stations**

Monitoring Station ID	Water Body	Rationale for Sampling
COB-6-SW	Coke Ovens Brook	To further characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B.
WB-1-SW	Wash Brook	To characterize surface water quality within the urban area of Sydney upstream of TP6B and TP7[6].
NARROWS	Wash Brook	To characterize surface water quality downgradient of the majority of the remediated sites.
BP-1-SW[7]	North Channel, Open Hearth Park	To further characterize surface water quality downgradient of the remediation sites and as it discharges to Sydney Harbour.

Notes:
1. CO7/CO8: Collection System (CO7)/Water Treatment Plant (CO8).
2. CO1: Coke Oven Brook.
3. CO6: Surface Cap.
4. Upstream monitoring station COB-B-SW was added to the monitoring program in 2015 to further characterize the potential for impacts from the municipal landfill to COB-A-SW.
5. TP6B: Solidification/Stabilization/Channel.
6. TP7: Tar Ponds Cap.
7. The LTMM location of surface water station BP-1-SW is similar to the location used during Pre-Construction activities associated with the EEM Program, and is approximately 40 meters (m) upstream from the collection point utilized during the Construction period of the EEM Program.

Field data was recorded on site specific electronic data sheets. Stream flow measurements were calculated by measuring the width of the stream at the sampling location and by measuring the depth of the stream at ¼, ½ and ¾ width intervals. The stream flow velocity was also measured at ¼, ½ and ¾ intervals. Using a spreadsheet formula, the approximate stream flow was calculated for each monitoring station (where possible). Due to the depth of surface water at the Narrows and BP-1-SW it was not possible to obtain field measurements across the entire channel widths. Dillon personnel collected as much field data at these deeper locations as safely possible (i.e., from the stream banks/shoreline, and from the bridge at the Narrows). The Muggah Creek North Channel Survey (CBCL Limited, October 2014) provided by NSLI is used in calculating the stream flow for BP-1-SW.

Sample containers were pre-labelled by the laboratory with the sample identification, analysis required and the project number. The date and time of sample collection were noted on the sample containers in the field at the time of collection. New nitrile

gloves were worn by field staff for each sample to avoid cross-contamination between sampling stations. Samples were collected by opening the container facing upstream. Where samples were collected directly into the sample bottles containing preservative, the container was not fully submerged during sampling to avoid washing the preservative out of the container. The sample bottles for metals analysis contained nitric acid preservative so that dissolved metals remained in solution.

Weather Conditions

Weather information obtained from Environment Canada's climate station Sydney CS, near the Sydney Airport, indicates that the total precipitation recorded between December 1 and 16, 2021 (the day of the surface water monitoring program) was approximately 98.8 millimeters (mm). No rainfall occurred during the sampling event.

Tidal information obtained from Meteo365 (https://www.tide-forecast.com) for December 16, 2021 indicated a high tide level of 0.94 m (at 6:43 am) and a low tide level of 0.48 m (at 12:14 pm).

Field Observations and Measurements

Observations at the ten surface water stations during the Fall 2021 monitoring program are summarized in Table 2. Field measurements are summarized in Table 3.

Table 2: Fall 2021 **Surface Water Quality Monitoring Field Observations**

Monitoring Station ID	Field Observations	Corresponding Photograph Numbers[1]
CB-SW	Vegetation growing in the brook and on the banks. Plywood and plastic debris observed in the brook.	1 and 2
NRC-1-SW	Vegetation observed in the channel and on the banks. Water appeared turbid from high flow.	3 and 4
SRC-1-SW	Spray painted graffiti at high water level along concrete channel has dissolved. Plastic, metal debris observed in the channel.	5 and 6
COB-A-SW	Vegetation observed in the brook, and on the brook banks.	7 and 8
COB-B-SW	Yellow/orange staining observed on stream bed soils, and vegetation lining the brook. A possible manganese sheen or iron precipitate observed near the brook banks. The periodic nearby groundwater seep was observed to be flowing into the brook.	9 and 10

Table 2: Fall 2021 **Surface Water Quality Monitoring Field Observations**

Monitoring Station ID	Field Observations	Corresponding Photograph Numbers[1]
COB-4-SW	Vegetation observed growing in and around the brook. Turbid water observed coming from upstream.	11 and 12
COB-6-SW	Vegetation observed along the channel banks, with moss observed on the channel bottom. Styrofoam debris observed along the brook banks.	13 and 14
WB-1-SW	Fish observed in the brook and vegetation observed along brook banks. Metal and wood debris observed in the brook and along the banks.	15 and 16
NARROWS	Snails, muscles, seaweed and barnacles observed on the rocks above and below the high tide water mark.	17 and 18
BP-1-SW	Seaweed, barnacles, and snails observed on the rocks above and below the high tide water mark. Plastic debris observed on the channel banks.	19 and 20

Note:
1. Photographs are presented in Appendix A.

Table 3: Fall 2021 Surface Water Quality Monitoring Field Measurements

Monitoring Station ID	pH	Turbidity (NTU)	Conductivity (mS/cm)	Salinity (%)	Stream Flow[1] (m^3/s)
CB-SW	8.03	0	0.279	0.13	0.10
NRC-1-SW	8.16	1000+[3]	0.221	0.11	0.08
SRC-1-SW	7.9	3.3	0.686	0.33	0.13
COB-A-SW	7.83	0	0.555	0.28	0.20
COB-B-SW	7.68	5.5	0.633	0.21	0.06
COB-4-SW	7.9	12.2	0.321	0.16	0.06
COB-6-SW	8.18	1.6	0.410	0.2	0.30
WB-1-SW	8.66	0	1.30	0.06	1.21
NARROWS	8.00	0	23.6	24.36	1.14
BP-1-SW [2]	8.16	0	36.4	25.81	1.06

Notes:
1. Stream flow is an approximate calculated value.
2. Collected during low tide conditions.
3. Measurement off scale.

Regulatory Framework

As specified in Section 4.2, page 21 of the NS Lands LTMM Plan, the comparison criteria used for eight of the ten surface water stations included in the LTMM monitoring program (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW and WB-1-SW) are the Nova Scotia Contaminated Sites Regulations (NS CSRs) Tier I Environmental Quality Standards (EQS) (which came into effect in 2013 and were updated in September 2021) for surface water (fresh water) and the Canadian Council of Ministers of the Environment (CCME) for the protection of fresh water aquatic life (FWAL) (accessed online January 2022). Analytical results for the remaining two surface water stations included in the monitoring program (i.e., Narrows and BP-1-SW) are compared to the NS CSRs Tier I EQS for surface water (marine) and the CCME guidelines for the protection of aquatic life (marine).

Additionally, as specified in Section 4.2, page 21 of the NSLI LTMM Plan, analytical results for surface water samples collected at the upstream sampling stations were compared to previously calculated 95% upper confidence limits (UCL) of available Pre-Construction/Baseline analytical data from the EEMSWCM Program associated with the Sydney Tar Ponds remediation. Furthermore, analytical results for the upstream sampling stations were also compared to calculated 95% UCLs of available historical upstream analytical data (i.e., the Upstream Calculated 95% UCL). Analytical results for the two sampling stations near Sydney Harbour were compared to the calculated 95% UCLs of available Pre-Construction/Baseline analytical data for the Battery Point sampling station.

Surface Water Quality Trend Analysis – Mann Kendall

Mann-Kendall analysis is a non-parametric statistic test routinely used to assess concentration trends (e.g., stable, decreasing, fluctuating, or increasing). At least four independent sampling events are required to evaluate surface water quality trends via Mann-Kendall analysis. The Mann-Kendall test procedure starts by comparing the most recent round of water quality data with the results of earlier rounds. Non-detect data values are typically assigned a value that is half the laboratory detection limit. The Mann-Kendall test is not designed to account for seasonal variation in data.

Based on a review of the analytical results from the Fall 2021 monitoring event, and historical monitoring events, select parameters, with concentrations above (or historically above) applicable guidelines were selected for Mann-Kendall analysis. These include PAH indicator parameters anthracene, pyrene, and benzo(a)pyrene, and inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate, and zinc.

In certain situations, Mann-Kendall analysis results may be biased due to elevated laboratory detection limits. Non-detected data on the Mann-Kendall analysis of indicator parameters was identified and Dillon confirmed that the influence of non-detected data is negligible.

Surface Water Results

The surface water quality results for the Fall 2021 event, and available post-remediation surface water data, are presented Tables B-1 and B-2, attached in Appendix B. Laboratory certificates of analysis are presented in Appendix C. As stated above, surface water samples were analyzed for PAHs (i.e., two locations only: COB-4-SW and COB-6-SW) and RCApMS. Samples were delivered to Bureau Veritas Laboratory in Sydney, Nova Scotia for analysis. Bureau Veritas is accredited through the Standard Council of Canada (SCC) and is a member of the Canadian Association for Laboratory Accreditation (CALA).

Review of the Fall 2021 data indicates analyzed PAH parameters were non-detect and/or below the comparison criteria. A summary of concentrations of select organic parameters (i.e., naphthalene and benzo(a)pyrene) reported at each station relative to the calculated 95% UCLs is provided in Table 4. There were no PAH exceedances of the relative calculated 95% UCLs during the Fall 2021 monitoring event.

Review of the Fall 2021 general chemistry and metals results indicates:

- Aluminum concentrations ranging from 6.8 µg/L to 41,000 µg/L exceeded the Tier I EQS (fresh water) of 5 µg/L in CB-SW (and FD-17, the field duplicate sample collected at CB-SW), NRC-1-SW (highest concentration (i.e., 41,000 ug/L)), SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, and WB-1-SW. The aluminium concentrations in CB-SW (and FD-17, the field duplicate sample collected at CB-SW), NRC-1-SW, SRC-1-SW, COB-4-SW, COB-6-SW, and WB-1-SW also exceeded the CCME FWAL guideline of 100 ug/L. The concentrations in NRC-1-SW and COB-4-SW, also exceeded the Upstream Calculated 95% UCL of 220 ug/L.
- Arsenic concentration of 50 ug/L in NRC-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL of 5 ug/L, the Upstream Calculated 95% UCL of 1.6 ug/L and the Pre-Construction/Baseline Calculated 95% UCL of 1.98 ug/L. The arsenic concentration of 2.6 ug/L in COB-4-SW also exceeded the Upstream Calculated 95% UCL and the Pre-Construction/Baseline Calculated 95% UCL.
- The beryllium concentration of 2.4 ug/L exceeded the Tier I EQS of 0.15 ug/L in NRC-1-SW.
- The cadmium concentration of 1.4 µg/L in NRC-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL of 0.09 µg/L, and the Upstream Calculated 95% UCL of 0.1 ug/L.

Table 4 - Summary of Organic Surface Water Indicator Parameter Concentrations relative to Calculated 95% (ug/L)				
Parameter	**Pre-Construction/ Baseline Calculated 95% UCL[1]**	**Date**	**COB-4-SW**	**COB-6-SW**
Naphthalene	1.8	12-22-14	<0.20	<0.20
		07-27-15	<0.20	<0.20
		11-18-15	<0.20	<0.20
		07-22-16	<0.20	<0.20
		12-08-16	<0.20	0.38
		08-03-17	<0.20	<0.20
		12-18-17	<0.20	0.54
		07-25-18	<0.20	<0.20
		11-23-18	<0.20	0.49
		07-29-19	<0.20	<0.20
		12-13-19	<0.20	0.75
		07-21-20	<0.20	<0.20
		12-01-20	<0.20	<0.20
		07-13-21	<0.20	<0.20
		12-16-21	<0.20	<0.20
Benzo(a)pyrene	0.05	12-22-14	<0.010	<0.010
		07-27-15	<0.010	<0.010
		11-18-15	**0.39**	0.015
		07-22-16	<0.010	<0.010
		12-08-16	0.028	0.027
		08-03-17	<0.010	<0.010
		12-18-18	<0.010	<0.010
		07-25-18	<0.010	<0.010
		11-23-18	<0.010	<0.010
		07-29-19	<0.010	<0.010
		12-13-19	<0.010	<0.010
		07-21-20	<0.010	<0.010
		12-01-20	<0.010	<0.010
		07-13-21	<0.010	<0.010
		12-16-21	<0.010	<0.010

Notes:

[1]Pre-Construction/Baseline Calculated 95% UCL are from the EEMSWCM Program

Bold indicates the concentration exceeds the Pre-Construction/Baseline Calculated 95% UCL

- The cobalt concentrations of 35 ug/L and 1.7 ug/L in NRC-1-SW and COB-4-SW, respectively exceeded the Tier I EQS (fresh water) of 1 ug/L, and the Pre-Construction/Baseline Calculated 95% UCL of 1.3 ug/L.
- The copper concentrations ranging from 2.6 ug/L to 54 ug/L in NRC-1-SW, SRC-1-SW, and COB-4-SW exceeded the Tier I EQS and CCME FWAL of 2 ug/L.
- Iron concentrations ranging from 300 ug/L and 55,000 ug/L in CB-SW (and FD-17, the field duplicate sample of CB-SW), NRC-1-SW, SRC-1-SW, COB-4-SW, and COB-6-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 300 ug/L. The iron concentrations in NRC-1-SW and COB-4-SW also exceeded the Pre-Construction/Baseline Calculated 95% UCL of 1,900 ug/L. The iron concentration in NRC-1-SW additionally exceeded the Upstream Calculated 95% UCL of 3,318 ug/L. The iron concentration of 290 ug/L in both the Narrows and BP-1-SW exceeded the Battery Point/Narrows Calculated 95% UCL of 190 ug/L.
- Lead concentrations of 98 ug/L and 4.5 ug/L in NRC-1-SW and COB-4-SW, respectively, exceeded the Tier I EQS and CCME FWAL of 1 ug/L, and the Upstream Calculated 95% UCL of 1.2 ug/L.
- The manganese concentration of 10,000 ug/L and 530 ug/L in NRC-1-SW and COB-4-SW, respectively, exceeded the Tier I EQS of 430 ug/L. The manganese concentration in NRC-1-SW also exceeded the Upstream Calculated 95% UCL of 583 ug/L, and the Pre-Construction/Baseline Calculated 95% UCL of 800 ug/L. The manganese concentration of 71 ug/L in BP-1-SW exceeded the Battery Point/Narrows Calculated 95% UCL of 70 ug/L.
- The mercury concentration of 0.18 ug/L in NRC-1-SW exceeded the Tier I EQS and CCME FWAL of 0.26 ug/L.
- The nickel concentration of 52 ug/L in NRC-1-SW exceeded the Tier I EQS and CCME FWAL of 25 ug/L.
- Strontium concentrations ranging from 170 µg/L to 220 µg/L in SRC-1-SW, COB-A-SW, COB-B-SW, and COB-6-SW exceeded the Upstream Calculated 95% UCL of 132 ug/L. The strontium concentration in COB-B-SW also exceeded the Pre-Construction/Baseline Calculated 95% UCL of 210 ug/L.
- The sulphate concentration of 180 ug/L in COB-B-SW exceeded the Tier I EQS of 128 ug/L. Sulphate concentrations ranging from 40 µg/L to 180 µg/L in SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, and COB-6-SW exceeded the Upstream Calculated 95% UCL of 26 ug/L. The sulphate concentrations in COB-A-SW and COB-B-SW also exceeded the Pre-Construction/Baseline Calculated 95% UCL of 84 ug/L.
- Zinc concentrations ranging from 7.3 ug/L to 360 ug/L in NRC-1-SW, SRC-1-SW, and COB-4-SW exceeded the Tier I EQS of 7 ug/L. Zinc concentrations in NRC-1-SW and COB-4-SW also exceeded the CCME FWAL calculated

guidelines of 11.09 ug/L and 7.36 ug/L, respectively. The zinc concentration of 53 ug/L in the Narrows exceeded the Tier 1 EQS of 10 ug/L.
- The laboratory detection limit for zinc in WB-1-SW was elevated above the calculated CCME FWAL guideline. The laboratory detection limit for selenium was elevated above the Tier I EQS, CCME FWAL and Upstream Calculated 95% UCL in NRC-1-SW.

Table 5 provides a summary of concentrations reported for select inorganic parameters relative to the calculated 95% UCLs. Inorganic parameter exceedances of the Upstream Calculated 95% UCLs occurred for:
- NRC-1-SW: aluminium, arsenic, cadmium, chromium, iron, lead, manganese, and strontium.
- SRC-1-SW, COB-A-SW, COB-B-SW, and COB-6-SW: sulphate and strontium.
- COB-4-SW: Sulphate, aluminium, arsenic, iron, lead and strontium.

Inorganic parameter exceedances of the Pre-Construction/Baseline Calculated 95% UCLs occurred for:
- NRC-1-SW: arsenic, cobalt, iron, manganese and strontium.
- COB-A-SW: sulphate.
- COB-B-SW: sulphate and strontium.

Exceedances of the Battery Point/Narrows Calculated 95% UCL occurred for:
- Narrows and BP-1-SW: iron.

Trend Analysis

The surface water quality trend analysis for the Fall 2021 monitoring event was based on the available analytical results (i.e., four rounds of sampling events are required) for select parameters, including:
- PAH indicator parameters anthracene, pyrene, and benzo(a)pyrene; and
- Inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate, and zinc.

Trend analysis results for these select parameters were generally stable. Strontium and sulphate at COB-A-SW indicate declining trends. Sulphate at CB-SW, strontium at NRC-1-SW, and zinc at the NARROWS indicate increasing trends. Cadmium and zinc at NRC-1-SW and SRC-1-SW; cadmium, boron and zinc at COB-A-SW; boron and cadmium at COB-B-SW; boron, cadmium and zinc at COB-4-SW, sulphate at COB-6-SW; and boron, strontium, sulphate and zinc at WB-1-SW indicated fluctuations with no trend.

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs

Sample Location	Date	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
	Units	(mg/L)	(ug/L)									
Upstream Calculated 95% UCL[1]		**26**	**220**	**1.6**	**0.1**	**8.3**	**-**	**3,318**	**1.2**	**583**	**1.9**	**132**
Pre-Construction/Baseline Calculated 95% UCL[1]		**84**	**-**	**1.98**	**-**	**-**	**1.3**	**1,900**	**-**	**800**	**-**	**210**
CB-SW	12-22-14	26	110	<1.0	0.018	<1.0	<0.40	290	<0.50	190	<1.0	130
	07-27-15	16	28	<1.0	<0.010	<1.0	<0.40	260	<0.50	61	<1.0	**320**
	11-18-15	24	130	<1.0	0.011	<1.0	<0.40	280	<0.50	140	<1.0	**140**
	07-22-16	10	55	1.4	<0.010	<1.0	<0.40	640	<0.50	71	<1.0	**160**
	12-08-16	23	84	<1.0	0.017	<1.0	<0.40	330	<0.50	310	<1.0	110
	08-03-17	12	150	1.4	<0.010	1.0	<0.40	750	0.61	380	<1.0	**340**
	12-18-17	24	91	<1.0	0.015	<1.0	<0.40	300	<0.50	200	<1.0	130
	07-25-18	Dry										
	11-23-18	**32**	91	<1.0	0.014	<1.0	<0.40	210	<0.50	210	<1.0	77
	07-29-19	Dry										
	12-13-19	**35**	**430**	<1.0	0.026	1.3	0.52	830	**2**	270	<0.50	78
	07-21-20	Dry - No Sample										
	12-01-20	**28**	45	<1.0	0.011	<1.0	<0.40	160	<0.50	83	<0.50	99
	07-13-21	Dry - No Sample										
	12-16-21	22	110	<1.0	0.014	<1.0	<0.40	330	<0.50	200	<0.50	62
NRC-1-SW	12-22-14	20	58	<1.0	0.022	<1.0	<0.40	150	<0.50	85	<1.0	32
	07-27-15	22	45	<1.0	0.019	<1.0	<0.40	1,300	<0.50	75	<1.0	54
	11-18-15	15	**1,500**	**3.5**	**0.14**	1.9	1.5	**3,800**	**9.5**	**1,100**	<1.0	36
	07-22-16	15	31	<1.0	0.016	<1.0	<0.40	970	0.61	47	<1.0	52
	12-08-16	16	110	<1.0	0.025	<1.0	<0.40	360	0.8	200	<1.0	34
	08-03-17	Dry										
	12-18-17	21	34	<1.0	0.016	<1.0	<0.40	140	<0.50	87	<1.0	31
	07-25-18	12	**270**	<1.0	0.012	<1.0	<0.40	460	0.99	62	<1.0	60
	11-23-18	17	36	<1.0	0.015	<1.0	<0.40	130	<0.50	61	<1.0	35
	07-29-19	15	46	<1.0	0.018	<1.0	<0.40	1400	<0.50	130	<1.0	55
	12-13-19	18	92	<1.0	0.020	<1.0	<0.40	270	<0.50	150	<0.50	34
	07-21-20	11	99	<1.0	0.011	<1.0	<0.40	160	2.7	26	<0.50	60
	12-01-20	**27**	14	<1.0	0.011	<1.0	<0.40	62	<0.50	37	<0.50	47
	07-13-21	18	19	<1.0	<0.010	<1.0	<0.40	130	<0.50	31	<0.50	110
	12-16-21	15	**41,000**	**50**	**1.4**	**40**	35	**55,000**	**98**	**10,000**	*<5.0*	**73**
SRC-1-SW	12-22-14	**54**	**290**	<1.0	0.035	<1.0	<0.40	340	1.2	190	<1.0	**150**
	07-27-15	**47**	51	1.0	0.013	<1.0	<0.40	210	1.1	260	<1.0	**150**
	11-18-15	**43**	**240**	<1.0	0.023	1.2	<0.40	310	0.75	230	<1.0	**150**
	07-22-16	**51**	50	**1.9**	0.018	<1.0	<0.40	350	<0.50	350	<1.0	**170**
	12-08-16	**42**	**300**	<1.0	0.039	1.0	<0.40	400	**1.6**	200	<1.0	**140**
	08-03-17	**54**	24	**1.8**	<0.010	<1.0	<0.40	150	<0.50	91	<1.0	**190**
	12-18-17	**50**	**3,000**	**4.1**	**0.31**	4.9	1.7	**4,600**	**10**	**2,200**	<1.0	**140**
	07-25-18	**43**	**2,500**	**4.9**	**0.26**	4.0	1.9	**5,500**	**12**	**2,600**	<1.0	**170**
	11-23-18	**46**	**320**	<1.0	0.027	<1.0	<0.40	420	**1.3**	160	<1.0	130
	07-29-19	Insufficient Water Present - No Sample										
	12-13-19	**47**	**460**	1.2	0.034	1.4	<0.40	770	**1.6**	150	<0.50	130
	07-21-20	**98**	96	**1.8**	0.019	<1.0	<0.40	350	<0.50	280	<0.50	200
	12-01-20	**43**	190	<1.0	0.017	<1.0	<0.40	280	0.72	190	<0.50	**150**
	07-13-21	**86**	19	1.3	<0.010	<1.0	<0.40	170	<0.50	94	<0.50	**160**
	12-16-21	**65**	220	1.4	0.033	1.1	<0.40	680	0.83	170	<0.50	**170**

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs

Sample Location	Date	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
	Units	(mg/L)	(ug/L)									
Upstream Calculated 95% UCL[1]		26	220	1.6	0.1	8.3	-	3,318	1.2	583	1.9	132
Pre-Construction/Baseline Calculated 95% UCL[1]		84	-	1.98	-	-	1.3	1,900	-	800	-	210
COB-A-SW	12-22-14	**160**	16	<1.0	<0.010	<1.0	<0.40	51	<0.50	25	<1.0	**260**
	07-27-15						Dry					
	11-18-15	**170**	5.1	<1.0	<0.010	<1.0	<0.40	82	<0.50	74	<1.0	**260**
	07-22-16						Dry					
	12-08-16	**150**	8.5	<1.0	<0.010	<1.0	<0.40	68	<0.50	92	<1.0	**250**
	08-03-17						Dry					
	12-18-17						Dry					
	07-25-18	**100**	**300**	**2.6**	0.058	<1.0	1.6	**9,100**	**1.4**	**2,900**	<1.0	**270**
	11-23-18	**110**	46	<1.0	<0.010	<1.0	<0.40	810	<0.50	300	<1.0	**210**
	07-29-19	**100**	10	<1.0	<0.010	<1.0	<0.40	240	<0.50	290	<1.0	**240**
	12-13-19	**120**	7.5	<1.0	<0.010	<1.0	<0.40	<50	<0.50	35	<0.50	**220**
	07-21-20						Dry - No Sample					
	12-01-20						Standing Water/No Flow - No Sample					
	07-13-21						Standing Water/No Flow - No Sample					
	12-16-21	**120**	7.1	<1.0	<0.010	<1.0	<0.40	53	<0.50	63	<0.50	**210**
COB-B-SW	12-22-14						Dry					
	11-18-15	**190**	7.9	<1.0	<0.010	<1.0	<0.40	<50	<0.50	21	<1.0	**250**
	07-22-16						Dry					
	12-08-16	**440**	13	<1.0	0.027	<1.0	0.90	130	<0.50	**1,400**	<1.0	**480**
	08-03-17						Dry					
	12-18-17	**120**	6.7	<1.0	<0.010	<1.0	0.42	110	<0.50	490	<1.0	**190**
	07-25-18						Dry					
	11-23-18	**110**	7.0	<1.0	<0.010	<1.0	0.46	200	<0.50	500	<1.0	**200**
	07-29-19						Dry					
	12-13-19	**120**	6.1	<1.0	<0.010	<1.0	<0.40	78	<0.50	190	<0.50	**200**
	07-21-20	**140**	6	<1.0	<0.010	<1.0	<0.40	85	<0.50	210	<0.50	**240**
	12-01-20	**150**	6.4	<1.0	<0.010	<1.0	<0.40	96	<0.50	210	<0.50	**220**
	07-13-21						Standing Water/No Flow - No Sample					
	12-16-21	**180**	6.8	<1.0	<0.010	<1.0	<0.40	91	<0.50	400	<0.50	**220**
COB-4-SW	12-22-14	**47**	82	<1.0	0.014	<1.0	<0.40	210	<0.50	95	<1.0	**140**
	07-27-15	**100**	51	<1.0	<0.010	<1.0	<0.40	460	<0.50	110	<1.0	**250**
	11-18-15	**41**	**7,100**	**13**	**0.29**	8.0	4.6	**14,000**	**37**	**1,500**	<1.0	**150**
	07-22-16	**74**	28	<1.0	<0.010	<1.0	<0.40	300	<0.50	140	<1.0	**270**
	12-08-16	**39**	120	<1.0	0.014	<1.0	<0.40	390	0.99	180	<1.0	110
	08-03-17	**110**	14	<1.0	0.011	<1.0	<0.40	83	<0.50	130	<1.0	**450**
	12-18-17	**42**	53	<1.0	0.010	<1.0	<0.40	270	<0.50	120	<1.0	110
	07-25-18	**100**	43	1.0	<0.010	<1.0	<0.40	51	0.75	23	<1.0	**430**
	11-23-18	**41**	140	<1.0	0.014	<1.0	<0.40	230	0.55	99	<1.0	130
	07-29-19	**69**	28	<1.0	<0.010	<1.0	<0.40	370	<0.50	150	<1.0	**230**
	12-13-19	**43**	35	<1.0	0.015	<1.0	<0.40	170	<0.50	130	<0.50	**110**
	07-21-20	**99**	20	<1.0	<0.010	<1.0	<0.40	120	<0.50	220	<0.50	**340**
	12-01-20	**57**	41	<1.0	<0.010	<1.0	<0.40	160	<0.50	160	<0.50	**170**
	07-13-21	**91**	58	<1.0	<0.010	<1.0	<0.40	250	<0.50	210	<0.50	**270**
	12-16-21	**40**	**1,900**	**2.6**	0.08	2.0	1.7	**2,700**	**4.5**	530	<0.50	**100**

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs												
Sample Location	**Date**	**SO4**	**Al**	**As**	**Cd**	**Cr**	**Co**	**Fe**	**Pb**	**Mn**	**Se**	**Sr**
	Units	**(mg/L)**	**(ug/L)**									
Upstream Calculated 95% UCL[1]		**26**	**220**	**1.6**	**0.1**	**8.3**	**-**	**3,318**	**1.2**	**583**	**1.9**	**132**
Pre-Construction/Baseline Calculated 95% UCL[1]		**84**	**-**	**1.98**	**-**	**-**	**1.3**	**1,900**	**-**	**800**	**-**	**210**
COB-6-SW	12-22-14	**56**	61	<1.0	0.01	<1.0	<0.40	170	<0.50	56	<1.0	**180**
	07-27-15	**91**	39	<1.0	<0.010	<1.0	<0.40	160	<0.50	23	<1.0	**300**
	11-18-15	**44**	220	<1.0	0.018	<1.0	<0.40	490	**1.5**	79	<1.0	**180**
	07-22-16	**64**	46	1.0	<0.010	<1.0	<0.40	180	<0.50	37	<1.0	**300**
	12-08-16	**41**	200	<1.0	0.015	<1.0	<0.40	360	1.0	110	<1.0	**160**
	08-03-17	**110**	42	1.3	0.011	<1.0	<0.40	<50	<0.50	35	<1.0	**500**
	12-18-17	**48**	130	<1.0	0.010	<1.0	<0.40	260	<0.50	73	<1.0	**160**
	07-25-18	**95**	23	<1.0	<0.010	<1.0	<0.40	140	<0.50	110	<1.0	**350**
	11-23-18	**45**	150	<1.0	0.015	<1.0	<0.40	360	0.87	130	<1.0	**140**
	07-29-19	**76**	37	<1.0	<0.010	<1.0	<0.40	130	<0.50	31	<1.0	**300**
	12-13-19	**49**	88	<1.0	0.014	<1.0	<0.40	220	<0.50	88	<0.50	**150**
	07-21-20	**110**	32	<1.0	0.016	<1.0	<0.40	<50	<0.50	32	<0.50	**430**
	12-01-20	**54**	52	<1.0	<0.010	<1.0	<0.40	120	<0.50	56	<0.50	**180**
	07-13-21	**100**	34	<1.0	<0.010	<1.0	<0.40	68	<0.50	32	<0.50	**340**
	12-16-21	**49**	160	<1.0	0.018	<1.0	<0.40	370	0.55	130	<0.50	**150**
WB-1-SW	12-22-14	7.9	160	<1.0	0.038	<1.0	<0.40	270	0.71	95	<1.0	53
	07-27-15	10	89	<1.0	0.012	<1.0	<0.40	480	<0.50	41	<1.0	100
	11-18-15	8.3	63	<1.0	<0.010	<1.0	<0.40	200	<0.50	43	<1.0	73
	07-22-16	**410**	87	<1.0	0.035	<1.0	<0.40	590	0.56	160	<1.0	**1300**
	12-08-16	8.4	100	<1.0	0.026	<1.0	<0.40	220	<0.50	100	<1.0	61
	08-03-17	**230**	28	1.0	0.027	<1.0	<0.40	680	<0.50	450	<1.0	**940**
	12-18-17	8.0	110	<1.0	0.022	<1.0	<0.40	190	<0.50	63	<1.0	49
	07-25-18	**71**	120	<1.0	0.024	<1.0	<0.40	330	**1.8**	140	<1.0	**320**
	11-23-18	6.5	**1,200**	**4.3**	**0.15**	3.5	1.2	**3700**	**28**	200	<1.0	50
	07-29-19	14	69	<1.0	0.02	<1.0	<0.40	290	<0.50	64	<1.0	120
	12-13-19	6.6	110	<1.0	0.027	<1.0	<0.40	210	<0.50	67	<0.50	39
	07-21-20	**330**	55	<1.0	0.087	<1.0	<0.40	420	<0.50	610	<0.50	**1200**
	12-01-20	7.0	110	<1.0	0.027	<1.0	<0.40	330	<0.50	69	<0.50	57
	07-13-21	**32**	87	<1.0	0.024	<1.0	<0.40	590	0.74	68	<0.50	**160**
	12-16-21	6.7	180	<1.0	0.035	<1.0	<0.40	280	<0.50	83	<0.50	33

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs

Sample Location	Date	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
	Units	(mg/L)	(ug/L)									
Upstream Calculated 95% UCL[1]		**26**	**220**	**1.6**	**0.1**	**8.3**	**-**	**3,318**	**1.2**	**583**	**1.9**	**132**
Pre-Construction/Baseline Calculated 95% UCL[1]		**84**	**-**	**1.98**	**-**	**-**	**1.3**	**1,900**	**-**	**800**	**-**	**210**
Battery Point/Narrows Calculated 95% UCL[1]		**2,180**	**-**	**-**	**-**	**-**	**0.9**	**190**	**-**	**70**	**-**	**7,000**
NARROWS	12-22-14	270	110	<1.0	0.027	<1.0	<0.40	**250**	<0.50	63	<1.0	610
	07-27-15	1,500	86	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***100***	<10	5,400
	11-18-15	110	76	<1.0	0.012	<1.0	<0.40	**320**	<0.50	45	<1.0	370
	07-22-16	1,400	51	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***120***	<10	5,400
	12-08-16	270	75	<1.0	0.029	<1.0	<0.40	**250**	<0.50	***110***	<1.0	890
	08-03-17	2,000	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***110***	<10	6,100
	12-18-17	150	110	<1.0	0.018	<1.0	<0.40	**280**	<0.50	***72***	<1.0	450
	07-25-18	1,700	56	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***100***	<10	5,000
	11-23-18	180	86	<1.0	0.021	<1.0	<0.40	**220**	<0.50	52	<1.0	500
	07-29-19	1,700	110	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***120***	<10	5,000
	12-13-19	120	110	<1.0	0.021	<1.0	<0.40	**290**	<0.50	65	<0.50	340
	07-21-20	2,100	66	<10	0.13	<10	*<4.0*	*<500*	<5.0	***120***	<5.0	5,600
	12-01-20	1,700	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	38	<5.0	4,500
	07-13-21	1,700	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***92***	<5.0	4,100
	12-16-21	250	130	<1.0	0.052	<1.0	<0.40	**290**	<0.50	70	<0.5	580
BP-1-SW	12-22-14	170	110	<1.0	0.028	<1.0	<0.40	***240***	<0.50	61	<1.0	950
	07-27-15	1,300	140	<10	<0.10	<10	*<4.0*	*<500*	<5.0	59	<10	5,300
	11-18-15	190	140	<1.0	0.014	<1.0	<0.40	***410***	<0.50	57	<1.0	580
	07-22-16	1,600	63	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***71***	<10	5,500
	12-08-16	290	86	<1.0	0.025	<1.0	<0.40	***280***	<0.50	***100***	<1.0	1,000
	08-03-17	2,000	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***110***	<10	6,100
	12-18-17	210	95	<1.0	0.020	<1.0	<0.40	***220***	<0.50	60	<1.0	630
	07-25-18	1,900	58	<10	<0.10	<10	*<4.0*	***1,000***	<5.0	**94**	<10	5,900
	11-23-18	250	86	<1.0	0.024	<1.0	<0.40	**240**	<0.50	50	<1.0	730
	07-29-19	1,700	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	50	<10	5,000
	12-13-19	250	88	<1.0	0.021	<1.0	*<0.40*	***220***	<0.50	51	<0.50	660
	07-21-20	2,100	63	<10	0.110	<10	*<4.0*	*<500*	<5.0	44	<5.0	5,500
	12-01-20	2,100	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	22	<5.0	5,600
	07-13-21	1,900	<50	<10	<0.10	<10	*<4.0*	*<500*	<5.0	***150***	<5.0	4,800
	12-16-21	260	130	<1.0	0.028	<1.0	<0.4	***290***	<0.50	***71***	<0.5	670

Notes:

[1]Upstream, Pre-Construction/Baseline and Battery Point/Narrows Calculated 95% UCLs are from the EEMSWCM Program

Bold indicates the concentration exceeds the Upstream Calculated 95% UCL

Underline indicates exceedance of the Pre-Construction/Baseline Calculated 95% UCL

Italics Bold indicates exceedance of the Battery Point/Narrows Calculated 95% UCL

Italics indicates that the laboratory detection limit is greater than the comparison criteria

Boron at NRC-1-SW appears to be statistically fluctuating; however, when studied further, results show concentrations are stable (rather than fluctuating) at/near the detection limits of the parameter.

Mann-Kendall results are presented in Appendix D.

Quality Control Process

The laboratory analytical certificate has been reviewed for quality assurance/quality control purposes. The laboratory completed quality control analysis including duplicates, blanks, spikes, surrogate recoveries and spiked blanks to assess accuracy and precision as well as the potential for bias, contamination and degradation or matrix effects. Review of the laboratory report indicated no concern relative to data quality.

One field duplicate sample (i.e., FD-17) was collected at CB-SW during the Fall 2021 monitoring event. The relative percent difference (RPD) was calculated between the original sample and associated field duplicate results. The RPD was not calculated for those parameters where one or both of the results associated with the original and/or field duplicate sample exhibited concentrations less than five times the laboratory reportable detection limit (RDL). Calculations indicate that the RPDs of the analyzed parameters were within the acceptable RPD range (i.e., 40% for organics and 25% for inorganics), with calculated RPDs ranging from 0% to 26.08%. The data quality is considered acceptable and the results representative. There were no holding time exceedances.

The lab report notes low level lab contamination associated with aluminum that affected the laboratory blank and resulted in an elevated RDL for aluminum. The elevated RDL is below comparison criteria and did not result in a data quality concern.

Summary

Many of the exceedances observed during the Fall 2021 event were identified at NRC-1-SW, and the sampling location downgradient at COB-4-SW. Recognizing that NRC-1-SW is representative of surface water flowing into the remediated former Tar Ponds area, these observations are not attributed singularly to the remediated Tar Ponds. Criteria and 95% UCL exceedances are summarized in Table 6.

Table 6: **Summary of Surface Water Station Criteria and 95% UCL Exceedances** Fall 2021

Parameter	Location (Criteria and/or 95% UCL Exceedance)
	General Chemistry and Metals
Aluminum	• CB-SW (and field duplicate FD-17) (Tier I EQS (fresh water) and CCME FWAL) • NRC-1-SW (Tier I EQS (fresh water), CCME FWAL and Upstream Calculated 95% UCL) • SRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-A-SW (Tier I EQS (fresh water)) • COB-B-SW (Tier I EQS (fresh water)) • COB-4-SW (Tier I EQS (fresh water), CCME FWAL and Upstream Calculated 95% UCL) • COB-6-SW (Tier I EQS (fresh water) and CCME FWAL) • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Arsenic	• NRC-1-SW (Tier I EQS (fresh water), CCME FWAL, Upstream Calculated 95% UCL and the Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Upstream Calculated 95% UCL and the Pre-Construction/ Baseline Calculated 95% UCL))
Beryllium	• NRC-1-SW (Tier I EQS (fresh water))
Cadmium	• NRC-1-SW (Tier I EQS (fresh water), CCME FWAL and Upstream Calculated 95% UCL)
Cobalt	• NRC-1-SW (Tier I EQS (fresh water) and the Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Tier I EQS (fresh water) and the Pre-Construction/Baseline Calculated 95% UCL)
Copper	• NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • SRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-4-SW (Tier I EQS (fresh water) and CCME FWAL)
Iron	• CB-SW (and field duplicate FD-17) (Tier I EQS (fresh water) and CCME FWAL) • NRC-1-SW (Tier I EQS (fresh water), CCME FWAL), Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL) • SRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-4-SW (Tier I EQS (fresh water), CCME FWAL and Pre-Construction/ Baseline Calculated 95% UCL) • COB-6-SW (Tier I EQS (fresh water) and CCME FWAL) • Narrows (Battery Point/Narrows Calculated 95% UCL) • BP-1-SW (Battery Point/Narrows Calculated 95% UCL)
Lead	• NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-4-SW (Tier I EQS (fresh water) and CCME FWAL)
Manganese	• NRC-1-SW (Tier I EQS (fresh water), Upstream Calculated 95% UCL and the Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Tier I EQS (fresh water) • BP-1-SW (Battery Point/Narrows Calculated 95% UCL)
Mercury	• NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL)

Table 6: **Summary of Surface Water Station Criteria and 95% UCL Exceedances** Fall 2021

Parameter	Location (Criteria and/or 95% UCL Exceedance)
	General Chemistry and Metals
Nickel	• NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Strontium	• SRC-1-SW (Upstream Calculated 95% UCL) • COB-A-SW (Upstream Calculated 95% UCL) • COB-B-SW (Upstream Calculated 95% UCL and Pre-Construction/ Baseline Calculated 95% UCL) • COB-6-SW (Upstream Calculated 95% UCL)
Sulphate	• SRC-1-SW (Upstream Calculated 95% UCL) • COB-A-SW (Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL) • COB-B-SW (Tier I EQS (fresh water), Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL) • COB-4-SW (Upstream Calculated 95% UCL) • COB-6-SW (Upstream Calculated 95% UCL)
Zinc	• NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • SRC-1-SW (Tier I EQS (fresh water)) • COB-4-SW (Tier I EQS (fresh water) and CCME FWAL) • Narrows (Tier I EQS (marine water))

Review of the surface water analytical data from the Fall 2021 monitoring event indicates findings are generally consistent with past LTMM events, with the following exceptions:

- NRC-1-SW: The aluminum, cadmium, chromium, cobalt, copper, iron, lead manganese, and zinc comparison criteria exceedances are the highest (in some cases by several orders of magnitude) observed at this location during the LTMM (2013-2022). The arsenic, beryllium, mercury, and nickel comparison criteria exceedances are the first observed at this sampling location during the LTMM. The results at NRC-1-SW are not consistent with past LTMM results.
- COB-4-SW: The aluminium, iron and zinc comparison criteria exceedances are the highest concentrations for these parameters at this location since 2015.
- The zinc exceedance in the Narrows is the first exceedance for this parameter at this location since 2016.

It is noted that the elevated metals concentrations in COB-4-SW and the Narrows may be related to influence from the upstream NRC-1-SW location. Further, it is noted that the NRC-1-SW location was observed to have a high turbidity flow (the field turbidity reading was off scale at 1000+ NTU) at the time of the sampling program. Turbid water was also observed flowing from upstream to the COB-4-SW location.

Recommendations

The next semi-annual surface water monitoring event will be conducted in summer 2022. It is recommended that the summer 2022 sampling program include the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) for RCApMS analysis. Samples will be collected from COB-4-SW and COB-6-SW for PAH analysis.

Disclaimer

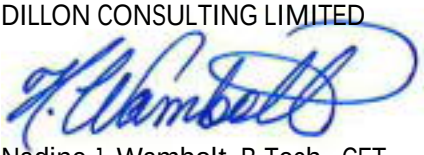
This report was prepared exclusively for the purposes, project and site location outlined in the report. The report is based on information provided to, or obtained by Dillon Consulting Limited ("Dillon") as indicated in the report, and applies solely to site conditions existing at the time of the site investigation. Although a reasonable investigation was conducted by Dillon, Dillon's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any contaminants from the site. Rather, Dillon's report represents a reasonable review of available information within an agreed work scope, schedule and budget. It is therefore possible that currently unrecognized contamination or potentially hazardous materials may exist at the site, and that the levels of contamination or hazardous materials may vary across the site. Further review and updating of the report may be required as local and site conditions, and the regulatory and planning frameworks, change over time.

Closing

We trust this information is adequate for your needs. Please, however, contact the undersigned if you have any comments or questions regarding the content of this report.

Yours truly,

DILLON CONSULTING LIMITED



Nadine J. Wambolt, B.Tech., CET
Project Manager, Associate

NJW:kme

Attachments

Appendix A

Site Photographs

Photo No. 1: View of CB-SW looking northwest.

Photo No. 2: View of CB-SW looking southeast.

Photo No. 3: View of NRC-1-SW looking north.

Photo No. 4: View of NRC-1-SW looking southeast.

Photo No. 5: View of SRC-1-SW looking northwest.

Photo No. 6: View of SRC-1-SW looking east**.**

Photo No. 7: View northeast of COB-A-SW, looking northeast.

Photo No. 8: View of COB-A-SW looking west.

Photo No. 9: View of COB-B-SW looking northeast.

Photo No. 10: View of a nearby intermittent groundwater surface seepage location north of COB-B-SW..

Photo No. 11: View of COB-4-SW looking west.

Photo No. 12: View of COB-4-SW looking northeast.

Photo No. 13: View of COB-6-SW looking west.

Photo No. 14: View of COB-6-SW looking northeast.

Photo No. 15: View of WB-1-SW looking northeast.

Photo No. 16: View of WB-1-SW looking southwest.

Photo No. 17: View of the Narrows looking northwest.

Photo No. 18: View of the Narrows looking east.

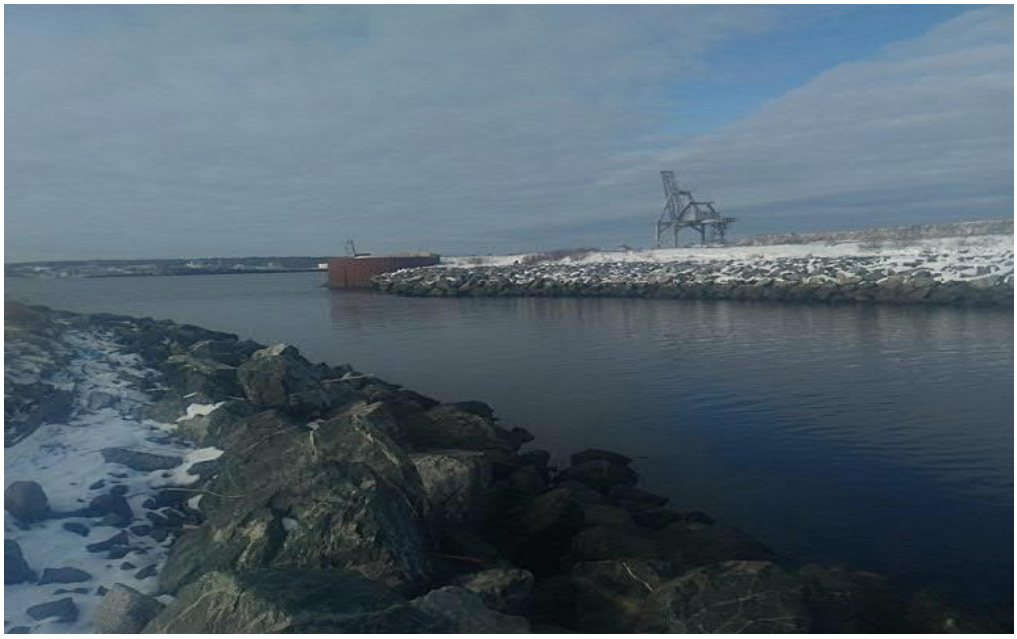


Photo No. 19: View of BP-1-SW looking northwest.

Photo No. 20: View of BP-1-SW looking east.

Appendix B

Tables

TABLE B-1

LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	-	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	0.1		0.04	3		2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
COB-4-SW	12-22-14	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-27-15	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.010	0.012
	11-18-15	0.14	0.027	**0.12**	**0.43**	**0.39**	0.33	**0.24**	0.20	0.19	**0.48**	0.073	**0.88**	0.078	**0.22**	<0.050	<0.050	<0.20	0.10	**0.48**	**0.74**
	07-22-16	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16[FD]	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	0.059	<0.010	**0.013**	**0.021**	**0.028**	0.026	0.018	0.017	0.014	0.031	<0.010	**0.043**	0.036	0.013	<0.050	<0.050	<0.20	<0.010	0.065	**0.04**
	08-03-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	8/3/17[FD]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-18-17	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07-25-18	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-23-18	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	<0.010
	07-29-19	0.029	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.010	<0.050	<0.050	<0.20	<0.020 *	0.013	<0.010
	12-13-19	0.031	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	07-21-20	0.037	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.050	<0.050	<0.20	<0.010	0.013	<0.010
	12-01-20	0.025	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.014	<0.010
	07-13-21	0.035	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.022	<0.010	<0.050	<0.050	<0.20	<0.010	0.013	<0.010
	12-16-21	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.012	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.014

TABLE B-1
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - PAHs

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water [1]		5.8	-	0.012	0.018	0.015	0.48 [3]	0.17	0.48 [3]	0.48 [3]	0.1		0.04	3		2	2	1.1	-	0.4	0.025
CCME FWAL [2]		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
COB-6-SW	07-23-13	0.073	0.025	**0.015**	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.034	0.034	<0.010	<0.20	<0.050	<0.05	<0.010	0.048	**0.026**
	12-22-14	0.089	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.02	0.026	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.013
	07-27-15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-18-15	0.016	<0.010	<0.010	0.015	0.015	0.016	0.019	<0.010	<0.010	0.018	<0.010	0.030	<0.010	0.016	<0.050	<0.050	<0.20	<0.010	0.014	**0.030**
	07-22-16	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-8-16	0.11	0.012	0.01	0.018	**0.027**	0.025	0.019	0.016	0.013	0.029	<0.010	**0.043**	0.052	0.013	0.083	<0.050	0.38	0.011	0.049	0.038
	08-03-17	0.052	0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.036	0.024	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	0.017
	12-18-17	0.13	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.048	<0.010	0.14	0.057	0.54	<0.010	0.030	0.012
	07-25-18	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11-23-18	0.15	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.076	<0.010	0.13	0.062	0.49	<0.010	0.043	0.01
	07-29-19	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.020 *	<0.010	<0.010
	12-13-19	0.19	0.019	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.091	<0.010	0.18	0.083	0.75	<0.010	0.049	0.015
	07-21-20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-01-20	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.010	<0.010
	07-13-21	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	12-16-21	0.11	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	0.051	<0.010	0.062	<0.050	<0.20	<0.010	0.021	0.012

NOTES:

ug/L - micrograms per liter

UCL - Upper Concentration Limit

- No applicable guideline criteria

1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) September 2021.

2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) accessed online January 2022.

3 - Guideline values for benzo(b)fluoranthene, benzo(j)fluoranthene and benzo(k)fluoranthene are to be compared to the sum of the parameters.

Bold	Concentration exceeds Tier I EQS for surface water (freshwater)
Shading	Concentration exceeds CCME FWAL
Double Underline	Concentration exceeds Upstream Calculated 95% Upper Concentration Limit
Red	Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit

This summary is to be used in conjunction with, not as a replacement of, the Laboratory Certificates of Analysis.

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
	Units	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
	NSE Tier 1 EQS Fresh Water [1]	-	-	-	-	-	128	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
	CCME FWAL [2]	-	-	-	-	-	-	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
	Upstream Calculated 95% UCL	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pre-Construction/Baseline Calculated 95% UCL	-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-SW	07-23-13	41100	1710	52000	5620	140	6.5	67	8.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	24	4.4	0.5	500	7.63	150	140	<1.0	270	4.81	0.93	0.08	-0.17	7.55	7.8
	12-22-14	20000	1400	27000	3700	62	26	30	7.3	0.046	110	0.18	<0.010	0.18	0.081	29	4.4	1.1	270	7.74	82	61	<1.0	150	2.65	1.53	-0.418	-0.669	8.16	8.41
	07-27-15	38000	1800	33000	4300	96	16	55	10.0	0.12	210	<0.050	<0.010	<0.050	0.087	9	2.0	1.1	380	7.95	99	95	<1.0	220	3.81	1.60	0.0480	-0.201	7.90	8.15
	11-18-15	27000	1700	28000	3800	72	24	43	7.6	0.048	110	0.12	<0.010	0.12	<0.050	20	5.3	2.1	320	7.81	84	72	<1.0	180	3.17	4.11	-0.271	-0.521	8.08	8.33
	07-22-16	27000	1400	27000	3500	75	10	40	8.6	0.096	140	0.11	0.012	0.12	0.052	65	9.8	1.6	270	7.88	82	75	<1.0	160	2.86	0	-0.188	-0.439	8.07	8.32
	12-8-16	22000	1400	26000	3400	65	23	48	7.1	0.033	<100	0.19	<0.010	0.19	<0.050	30	4.9	1.9	280	7.46	78	65	<1.0	170	3.12	9.86	-0.694	-0.944	8.15	8.4
	8-3-17	33000	2200	30000	3900	97	12	56	10	0.15	330	<0.010	0.06	0.06	0.071	<5.0	1.9	0.88	370	7.99	92	96	<1.0	210	3.76	5.92	0.065	-0.185	7.93	8.18
	12-18-17	22000	1300	26000	3500	66	24	38	7.3	0.038	<100	0.13	<0.01	0.13	<0.050	26	5.7	2.1	280	7.79	80	65	<1.0	160	2.89	5.47	-0.345	-0.595	8.14	8.39
	07-25-18	DRY - NO SAMPLE																												
	11-23-18	68000	1300	29000	3500	58	32	**130**	6.5	<0.010	<100	0.19	<0.010	0.19	0.059	36	5.8	1.2	550	7.70	88	58	<1.0	300	5.38	6.11	-0.494	-0.743	8.19	8.44
	07-29-19	DRY - NO SAMPLE																												
	12-13-19	24000	1400	31000	3900	66	35	42	7.3	0.011	<100	0.21	<0.010	0.21	0.053	27	4.6	10	310	7.93	94	66	<1.0	190	3.24	3.68	-0.139	-0.389	8.07	8.32
	07-21-20	DRY - NO SAMPLE																												
	12-01-20	25000	1500	29000	3700	62	28	43	5.9	0.024	<100	0.13	0.014	0.14	0.063	27	6.8	1.8	310	7.66	87	62	<1.0	170	3.05	3.21	-0.464	-0.714	8.13	8.38
	07-13-21	DRY - NO SAMPLE																												
	12-16-21 [FD]	24000	1100	25000	2800	56	22	38	6.5	<0.010	<100	0.16	<0.010	0.16	<0.050	38	5.3	4.2	270	7.84	73	56	<1.0	160	2.68	2.68	-0.394	-0.644	8.23	8.48
	12-16-21	24000	1100	24000	2800	55	22	37	6.3	<0.010	<100	0.16	<0.010	0.16	0.088	38	5.5	5.5	270	7.75	71	55	<1.0	150	2.63	2.14	-0.502	-0.753	8.25	8.5
NRC-1-SW	07-23-13	27800	1560	16600	1370	46	19	27	9.6	0.022	<100	0.092	0.011	0.1	0.098	19	3.9	1.3	220	8.31	47	45	<1.0	131	2.09	2.56	-0.172	-0.423	8.48	8.73
	07/23/13[L]	NM	NM	NM	NM	NM	19	27	9.5	0.028	NM	NM	0.011	0.1	NM	16	NM	NM	220	8.22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	12-22-14	13000	640	12000	1500	17	20	20	5.1	<0.010	<100	0.21	<0.010	0.21	<0.050	10	2.2	0.51	140	7.28	36	17	<1.0	84	1.34	0.37	-1.75	-2.01	9.03	9.28
	07-27-15	20000	480	19000	2100	44	22	29	6.0	<0.010	<100	0.077	<0.010	0.077	0.077	42	5.8	2.4	220	7.47	56	44	<1.0	130	2.16	2.61	-0.963	-1.21	8.43	8.68
	11-18-15	14000	1000	12000	1800	25	15	25	5.7	<0.010	130	0.10	<0.010	0.10	<0.050	15	4.2	21	160	7.37	38	25	<1.0	95	1.51	0.980	-1.49	-1.74	8.86	9.11
	07-22-16	20000	690	18000	2200	49	15	25	5.8	0.012	<100	0.13	<0.010	0.13	<0.050	42	8.1	1.6	200	7.96	55	48	<1.0	120	2	0.25	-0.447	-0.698	8.41	8.66
	12-8-16	15000	680	12000	1600	21	16	26	5.3	<0.010	<100	0.19	<0.010	0.19	0.1	11	2.2	2.3	160	7.21	36	21	<1.0	90	1.49	3.47	-1.74	-1.99	8.95	9.2
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	15000	730	12000	1700	21	21	25	5.7	<0.010	<100	0.21	<0.010	0.21	<0.050	6.7	3.3	0.71	170	7.22	36	21	<1.0	94	1.57	6.44	-1.74	-1.99	8.95	9.2
	07-25-18	25000	770	20000	2400	48	12	39	5.5	<0.010	<100	0.12	<0.010	0.12	<0.050	24	6.4	1.7	260	7.73	59	48	<1.0	140	2.32	0.22	-0.657	-0.907	8.38	8.63
	11-23-18	49000	710	12000	1700	21	17	87	5.0	<0.010	<100	0.14	<0.010	0.14	<0.050	12	2.7	0.89	350	6.98	38	21	<1.0	190	3.24	5.37	-1.99	-2.24	8.97	9.22
	07-29-19	24000	630	19000	2400	52	15	34	6.6	<0.010	<100	<0.010	**0.077**	0.077	<0.050	49	6.2	2.7	220	7.86	57	52	<1.0	130	2.32	1.98	-0.508	-0.759	8.37	8.62
	12-13-19	17000	680	13000	1700	26	18	29	5.5	<0.010	<100	0.17	<0.010	0.17	<0.050	11	2.4	0.87	160	7.11	38	26	<1.0	100	1.71	5.88	-1.71	-1.96	8.82	9.07
	07-21-20	17000	680	18000	1600	44	11	30	4.9	<0.010	<100	<0.050	<0.010	<0.050	0.05	13	4.8	1.3	200	7.67	52	44	<1.0	110	1.95	4	-0.775	-1.03	8.44	8.70
	12-01-20	20000	760	16000	2200	24	27	37	4.8	<0.010	<100	0.11	<0.010	0.11	<0.050	5.6	2.1	0.27	220	7.42	49	24	<1.0	120	2.08	5.32	-1.35	-1.60	8.77	9.02
	07-13-21	24000	820	21000	2700	60	18	28	5.7	0.02	<100	<0.050	<0.010	<0.050	<0.050	12	3.9	0.77	240	7.7	63	59	<1.0	140	2.35	0.64	-0.572	-0.82	8.27	8.52
	12-16-21	27000	5100	16000	7800	25	15	43	5.4	<0.010	1600	0.25	<0.010	0.25	0.13	8.5	30**	>1000	220	7.12	73	25	<1.0	200	2.06	39.3	-1.66	-1.91	8.78	9.03
SRC-1-SW	07-23-13	39700	2290	51700	7230	110	40	59	6.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	14	4.9	0.46	500	8.37	160	110	2.4	272	4.67	3.11	0.7	0.451	7.67	7.92
	12/22/14[FD]	34000	2700	46000	4800	87	53	56	8.3	<0.010	<100	0.24	0.025	0.26	0.20	16	4.6	5.0	450	7.92	130	86	<1.0	260	4.44	2.42	0.108	-0.141	7.81	8.06
	12-22-14	34000	2600	46000	4800	86	54	56	7.6	<0.010	<100	0.23	0.023	0.25	0.21	16	4.8	5.4	440	7.80	140	85	<1.0	260	4.43	1.84	-0.01	-0.259	7.81	8.06
	07/27/15[FD]	40000	1900	42000	4700	95	46	55	6.6	<0.010	<100	0.092	<0.010	0.092	0.084	17	5.0	1.5	430	7.79	120	94	<1.0	250	4.41	1.73	-0.024	-0.273	7.81	8.06
	07-27-15	38000	1800	41000	4300	95	47	57	6.7	<0.010	<100	0.092	<0.010	0.092	0.079	16	5.0	1.6	430	7.66	120	95	<1.0	250	4.49	4.54	-0.157	-0.407	7.82	8.07
	11-18-15	32000	2700	41000	4600	94	43	51	5.7	<0.010	<100	0.076	<0.010	0.076	<0.050	13	5.0	4.4	430	7.87	120	93	<1.0	240	4.22	3.94	0.0500	-0.200	7.82	8.07
	07-22-16	33000	2900	48000	5600	100	51	46	8.9	0.013	<100	0.08	<0.010	0.08	<0.050	22	7.3	1.8	420	7.99	140	100	<1.0	260	4.39	0	0.266	0.016	7.73	7.98
	12-8-16	51000	2300	42000	4500	86	42	110	7.8	0.012	<100	0.15	0.012	0.16	0.17	19	4.3	7.3	520	7.58	120	86	<1.0	310	5.58	7.72	-0.29	-0.539	7.87	8.12
	8-3-17	50000	2800	51000	5400	120	54	85	10	<0.010	<100	0.014	<0.050	0.055	0.073	14	5.7	1.2	580	8.15	150	110	1.5	330	5.83	5.42	0.492	0.243	7.66	7.91
	12-18-17	24000	5200	110000	22000	86	**290**	25	13	<0.3	<100	0.17	<0.06	0.17	0.2	72	2.6	17	740	7.7	380	85	<1	545	8.39	2.1	0.214	-0.034	7.49	7.73
	07-25-18[FD]	45000	2700	50000	6000	120	43	63	1.8	<0.010	140	0.066	<0.010	0.066	<0.050	19	8.5	250	530	8	150	120	1.1	290	5.06	1.65	0.348	0.099	7.65	7.9
	07-25-18	48000	2700	48000	2600	110	43	69	2.0	<0.010	180	0.085	<0.010	0.085	<0.050	18	11	140	540	8.14	140	110	1.4	290	5.09	0.1	0.447	0.197	7.69	7.94
	11-23-18	50000	2200	40000	4400	91	46	90	7.7	<0.010	<100	0.19	0.011	0.20	0.41	22	5.3	6.8	530	7.71	120	91	<1.0	300	5.32	6.61	-0.152	-0.401	7.86	8.11
	07-29-19	INSUFFICIENT WATER PRESENT - NO SAMPLE																												
	12-13-19	48000	2300	42000	4400	89	47	74	7.6	<0.010	<100	0.19	0.012	0.21	0.24	23	4.9	18	500	7.72	120	88	<1.0	280	4.87	2.10	-0.117	-0.366	7.84	8.09
	07-21-20	65000	4600	74000	8200	120	98	99	7.2	<0.010	<100	0.24	<0.010	0.24	0.06	14	6.2	3	730	7.82	220	120	<1.0	430	7.21	0.62	0.307	0.058	7.52	7.77
	12-01-20	47000	2300	46000	5000	100	43	75	6.9	<0.010	<100	0.10	<0.010	0.10	<0.050	13	5.0	6.1	520	7.90	140	100	<1.0	290	5.03	2.34	0.144	-0.106	7.75	8.00
	07-13-21	47000	4300	61000	6500	110	86	66	6.6	<0.010	<100	0.50	0.012	0.51	0.064	16	6.2	1.4	610	7.80	180	110	<1.0	340	5.8	0.35	0.176	-0.073	7.62	7.87
	12-16-21	65000	3900	53000	5600	96*	65	110	8.7	<0.010	<100	0.56	0.017	0.58	1.4	29	6.2	9.9	670	7.87	150	96	<1.0	370	6.34	1.77	0.132	-0.116	7.74	7.99

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	NSE Tier 1 EQS Fresh Water [1]	5	9	5.0	1000	0.15	-	1500	0.09	8.9	1	2	300	1	430	0.026	73	25	1.0	0.25	21000	0.8	-	-	15	120	7
	CCME FWAL [2]	100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [10]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	See Note [9]
	Upstream Calculated 95% UCL	220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
	Pre-Construction/Baseline Calculated 95% UCL	-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
CB-SW	07-23-13	**28.5**	<1.0	1.4	61.9	*<1.0*	<2.0	<50	0.016	1.3	<0.40	2.0	**454**	<0.50	**3690**	NM	<2.0	<2.0	<1.0	<0.10	196	<0.10	<2.0	<2.0	0.37	<2.0	<5
	12-22-14	**110**	<1.0	<1.0	27	*<1.0*	<2.0	<50	0.018	<1.0	<0.40	<2.0	290	<0.50	190	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.5	0.17	<2.0	6.0
	07-27-15	**28**	<1.0	<1.0	52	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	260	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	320	<0.10	<2.0	<2.0	<0.10	<2.0	**9.0**
	11-18-15	**130**	<1.0	<1.0	29	*<1.0*	<2.0	<50	0.011	<1.0	<0.40	<2.0	280	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	4.3	0.12	<2.0	6.1
	07-22-16	**55**	<1.0	1.4	30	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	**640**	<0.50	71	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	5.6	<0.10	<2.0	<5.0
	12-8-16	**84**	<1.0	<1.0	25	*<1.0*	<2.0	<50	0.017	<1.0	<0.40	<2.0	**330**	<0.50	310	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.14	<2.0	<5.0
	8-3-17	**150**	<1.0	1.4	87	*<1.0*	<2.0	<50	<0.010	1.0	<0.40	<2.0	**750**	0.61	380	<0.013	<2.0	<2.0	<1.0	<0.10	340	<0.10	<2.0	2.9	<0.10	2.6	<5.0
	12-18-17	**91**	<1.0	<1.0	28	*<1.0*	<2.0	<50	0.015	<1.0	<0.40	<2.0	**300**	<0.50	200	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	2.4	0.11	<2.0	<5.0
	07-25-18	DRY - NO SAMPLE																									
	11-23-18	**91**	<1.0	<1.0	16	*<1.0*	<2.0	<50	0.014	<1.0	<0.40	<2.0	210	<0.50	210	<0.013	<2.0	<2.0	<1.0	<0.10	77	<0.10	<2.0	2.4	0.19	<2.0	5.5
	07-29-19	DRY - NO SAMPLE																									
	12-13-19	**430**	<1.0	<1.0	15	*<1.0*	<2.0	<50	0.026	1.3	0.52	**2.6**	**830**	**2.0**	270	<0.013	<2.0	<2.0	<0.50	<0.10	78	<0.10	<2.0	11	0.22	2.5	**12**
	07-21-20	DRY - NO SAMPLE																									
	12-01-20	**45**	<1.0	<1.0	15	*<1.0*	<2.0	<50	0.011	<1.0	<0.40	1.4	160	<0.50	83	<0.013	<2.0	<2.0	<0.50	<0.10	99	<0.10	<2.0	<2.0	0.11	<2.0	6.5
	07-13-21	DRY - NO SAMPLE																									
	12-16-21 [FD]	**110**	<1.0	<1.0	11	<0.10	<2.0	<50	0.012	<1.0	<0.40	1.3	**330**	<0.50	200	<0.013	<2.0	<2.0	<0.50	<0.10	63	<0.10	<2.0	2.6	0.14	<2.0	5.1
	12-16-21	**110**	<1.0	<1.0	11	<0.10	<2.0	<50	0.014	<1.0	<0.40	1.3	**300**	<0.50	200	<0.013	<2.0	<2.0	<0.50	<0.10	62	<0.10	<2.0	2.8	0.14	<2.0	<5.0
NRC-1-SW	07-23-13	**131**	<1.0	1.4	11.8	*<1.0*	<2.0	<50	0.021	<1.0	<0.40	**3.1**	148	**1.53**	69.1	NM	<2.0	<2.0	<1.0	<0.10	64.7	<0.10	<2.0	2.4	0.21	2.2	5.3
	07/23/13 [L]	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	12-22-14	**58**	<1.0	<1.0	12	*<1.0*	<2.0	<50	0.022	<1.0	<0.40	<2.0	150	<0.50	85	<0.013	<2.0	<2.0	<1.0	<0.10	32	<0.10	<2.0	<2.0	<0.10	<2.0	**9.1**
	07-27-15	**45**	<1.0	<1.0	11	*<1.0*	<2.0	<50	0.019	<1.0	<0.40	<2.0	**1300**	<0.50	75	<0.013	<2.0	<2.0	<1.0	<0.10	54	<0.10	<2.0	<2.0	<0.10	<2.0	**11**
	11-18-15	**1500**	<1.0	3.5	29	*<1.0*	<2.0	<50	**0.14**	1.9	**1.5**	**5**	**3800**	**9.5**	**1100**	<0.013	<2.0	3.3	<1.0	<0.10	36	<0.10	<2.0	34	0.14	3	**27**
	07-22-16	**31**	<1.0	<1.0	10	*<1.0*	<2.0	<50	0.016	<1.0	<0.40	<2.0	**970**	0.61	47	<0.013	<2.0	<2.0	<1.0	<0.10	52	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	12-8-16	**110**	<1.0	<1.0	19	*<1.0*	<2.0	<50	0.025	<1.0	<0.40	<2.0	**360**	0.8	200	<0.013	<2.0	<2.0	<1.0	<0.10	34	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	**34**	<1.0	<1.0	11	*<1.0*	<2.0	<50	0.016	<1.0	<0.40	<2.0	140	<0.50	87	<0.013	<2.0	<2.0	<1.0	<0.10	31	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-25-18	**270**	<1.0	<1.0	14	*<1.0*	<2.0	<50	0.012	<1.0	<0.40	**2.5**	**460**	0.99	62	<0.013	<2.0	<2.0	<1.0	<0.10	60	<0.10	<2.0	7.0	0.10	<2.0	<5.0
	11-23-18	**36**	<1.0	<1.0	13	*<1.0*	<2.0	<50	0.015	<1.0	<0.40	<2.0	130	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	35	<0.10	<2.0	<2.0	<0.1	<2.0	6.7
	07-29-19	**46**	<1.0	<1.0	9.7	*<1.0*	<2.0	<50	0.018	<1.0	<0.40	0.77	**1400**	<0.50	130	<0.013	<2.0	<2.0	<1.0	<0.10	55	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	12-13-19	**92**	<1.0	<1.0	12	*<1.0*	<2.0	<50	0.020	<1.0	<0.40	0.82	270	<0.50	150	<0.013	<2.0	<2.0	<0.50	<0.10	34	<0.10	<2.0	2.1	<0.10	<2.0	5.1
	07-21-20	**99**	<1.0	<1.0	11	*<1.0*	<2.0	<50	0.011	<1.0	<0.40	1.9	160	**2.7**	26	<0.013	<2.0	<2.0	<0.50	<0.10	60	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-01-20	**14**	<1.0	<1.0	13	*<1.0*	<2.0	<50	0.011	<1.0	<0.40	0.54	62	<0.50	37	<0.013	<2.0	<2.0	<0.50	<0.10	47	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-13-21	**19**	<1.0	<1.0	26	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	1.2	130	<0.50	31	<0.013	<2.0	<2.0	<0.50	<0.10	110	<0.10	<2.0	<2.0	<0.10	<2.0	**14**
	12-16-21	**41000**	*<10*	**50**	290	**2.4**	<20	<500	**1.4**	**40**	**35**	**54**	**55000**	**98**	**10000**	**0.18**	<20	**52**	*<5.0*	<1.0	73	<1.0	<20	810	1.7	67	**360**
SRC-1-SW	07-23-13	**29**	<1.0	1.2	10.2	*<1.0*	<2.0	57	<0.01	<1.0	<0.40	<2.0	69	<0.50	41.4	NM	<2.0	<2.0	<1.0	<0.10	174	<0.10	<2.0	<2.0	0.38	<2.0	<5
	12/22/14 [FD]	**350**	<1.0	<1.0	17	*<1.0*	<2.0	110	0.042	<1.0	<0.40	**2.8**	**350**	**1.2**	200	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.8	0.40	<2.0	7.0
	12-22-14	**290**	<1.0	<1.0	17	*<1.0*	<2.0	110	0.035	<1.0	<0.40	**2.6**	**340**	**1.2**	190	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.6	0.40	<2.0	6.9
	07/27/15 [FD]	**51**	<1.0	1.0	17	*<1.0*	<2.0	64	0.015	1.5	<0.40	<2.0	190	<0.50	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	<2.0	0.32	<2.0	8.4
	07-27-15	**51**	<1.0	1.0	16	*<1.0*	<2.0	63	0.013	<1.0	<0.40	**24**	210	**1.1**	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	2.4	0.29	<2.0	**9.5**
	11-18-15	**240**	<1.0	<1.0	16	*<1.0*	<2.0	57	0.023	1.2	<0.40	**2.2**	**310**	0.75	230	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	5.3	0.33	<2.0	<5.0
	07-22-16	**50**	<1.0	1.9	11	*<1.0*	<2.0	91	0.018	<1.0	<0.40	<2.0	**350**	<0.50	350	<0.013	<2.0	<2.0	<1.0	<0.10	170	<0.10	<2.0	2.1	0.38	<2.0	<5.0
	12-8-16	**300**	<1.0	<1.0	18	*<1.0*	<2.0	54	0.039	1.0	<0.40	**2.7**	**400**	**1.6**	200	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	13	0.35	<2.0	5.7
	8-3-17	**24**	<1.0	1.8	19	*<1.0*	<2.0	130	<0.010	<1.0	<0.40	<2.0	150	<0.50	91	<0.013	<2.0	<2.0	<1.0	<0.10	190	<0.10	<2.0	<2.0	0.4	<2.0	<5.0
	12-18-17	**17**	<0.4	<0.6	25	*<0.5*	<2	<100	0.017	2.8	2.1	<2	**1400**	<1	1500	<0.013	<4	<3	<1	<0.1	350	<0.8	<20	<3	0.31	<2.0	6.2
	07-25-18 [FD]	**1600**	<1.0	3.5	45	*<1.0*	<2.0	120	**0.18**	2.5	**1.2**	**5.3**	**3400**	**9.5**	**2600**	**0.04**	<2.0	2.1	<1.0	<0.10	180	<0.10	<2.0	34	0.54	4.9	**30**
	07-25-18	**2500**	1.1	4.9	58	*<1.0*	<2.0	120	**0.26**	4.0	**1.9**	**7.9**	**5500**	**12**	**2600**	**0.04**	<2.0	3.4	<1.0	<0.10	170	<0.10	<2.0	50	0.56	7.4	**47**
	11-23-18	**320**	<1.0	<1.0	16	*<1.0*	<2.0	74	0.027	<1.0	<0.40	**2.7**	**420**	**1.3**	160	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	9.3	0.32	<2.0	6.2
	07-29-19	INSUFFICIENT WATER PRESENT - NO SAMPLE																									
	12-13-19	**460**	<1.0	1.2	19	*<1.0*	<2.0	74	0.034	1.4	<0.40	**2.8**	**770**	**1.6**	150	<0.013	<2.0	<2.0	<0.5	<0.10	130	<0.10	<2.0	13	0.39	<2.0	**7.3**
	07-21-20	**96**	<1.0	1.8	24	*<1.0*	<2.0	210	0.019	<1.0	<0.40	1.9	**350**	<0.50	280	<0.013	<2.0	<2.0	<0.5	<0.10	200	<0.10	<2.0	2.8	0.47	<2.0	<5.0
	12-01-20	**190**	<1.0	<1.0	16	*<1.0*	<2.0	<50	0.017	<1.0	<0.40	1.9	280	0.72	190	<0.013	<2.0	<2.0	<0.50	<0.10	150	<0.10	<2.0	5.9	0.34	<2.0	<5.0
	07-13-21	**19**	<1.0	1.3	13	*<1.0*	<2.0	200	<0.010	<1.0	<0.40	1.6	170	<0.50	94	<0.013	<2.0	<2.0	<0.50	<0.10	160	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	12-16-21	**220**	<1.0	1.4	18	<0.10	<2.0	200	0.033	1.1	<0.40	**2.6**	**680**	0.83	170	<0.013	<2.0	<2.0	<0.50	<0.10	170	<0.10	<2.0	5.9	0.48	<2.0	**7.3**

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
	Units	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
	NSE Tier 1 EQS Fresh Water [1]	-	-	-	-	-	128	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
	CCME FWAL [2]	-	-	-	-	-	-	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
	Upstream Calculated 95% UCL	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pre-Construction/Baseline Calculated 95% UCL	-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB-A-SW	07-23-13	94700	27000	336000	34900	150	**740**	**150**	22	<0.010	<100	3.5	<0.010	3.5	<0.05	5.3	4.8	0.1	2000	7.90	980	150	1.1	1,510	22.8	3.51	1	0.756	6.9	7.14
	12-22-14	23000	3300	88000	13000	97	**160**	37	13	<0.010	<100	0.4	<0.010	0.4	<0.050	5.4	2	0.41	640	7.68	270	96	<1.0	400	6.32	1.94	0.165	-0.084	7.52	7.76
	07-27-15	DRY - NO SAMPLE																												
	11-18-15	24000	3700	88000	13000	120	**170**	33	12	0.013	<100	0.25	<0.010	0.25	<0.050	<5.0	2.6	0.25	640	7.95	270	120	<1.0	420	6.88	2.38	0.505	0.257	7.44	7.69
	07-22-16	DRY - NO SAMPLE																												
	12-8-16	22000	4000	81000	11000	110	**150**	47	13	0.015	<100	0.49	0.012	0.51	0.59	6.3	2.8	0.35	640	7.75	250	100	<1.0	400	6.65	4.64	0.235	-0.014	7.52	7.77
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	DRY - NO SAMPLE																												
	07-25-18	27000	1600	80	9300	140	100	37	16	<0.010	0.16	<0.05	<0.010	<0.05	<0.050	8.2	3.3	2.4	600	8.05	240	140	1.5	370	5.99	2.44	0.658	0.409	7.39	7.64
	11-23-18	21000	2300	70000	10,000	110	110	32	13	<0.010	<100	0.24	<0.010	0.24	0.050	6.2	2.3	14	540	7.78	220	110	<1.0	330	5.42	0.840	0.216	-0.033	7.56	7.81
	07-29-19	29000	1700	75000	9,000	140	100	40	15	<0.010	<100	<0.010	<0.050	<0.050	<0.050	9.2	2.6	0.84	550	8.02	220	140	1.4	360	6.09	2.78	0.611	0.363	7.41	7.66
	12-13-19	21000	2100	71000	9700	110	120	33	13	<0.010	<100	0.21	0.011	0.22	<0.050	5.1	2.5	0.21	510	7.95	220	110	<1.0	330	5.58	2.48	0.405	0.156	7.54	7.79
	07-21-20	DRY - NO SAMPLE																												
	12-01-20	STANDING WATER/NO FLOW - NO SAMPLE																												
	07-13-21	STANDING WATER/NO FLOW - NO SAMPLE																												
	12-16-21	22000	2400	75000	9500	97*	120	31	14	<0.010	<100	0.25	<0.010	0.25	<0.050	<5.0	2.2	0.68	550	7.94	230	96	<1.0	340	5.4	1.64	0.367	0.118	7.57	7.82
COB-B-SW	07-27-15	DRY - NO SAMPLE																												
	11-18-15	25000	3800	89000	13000	110	**190**	35	11	0.013	<100	0.35	<0.010	0.35	<0.050	<5.0	2.4	<0.10	670	7.86	280	110	<1.0	430	7.13	3.03	0.393	0.144	7.46	7.71
	07-22-16	DRY - NO SAMPLE																												
	12-8-16	68000	20000	200000	21000	170	**440**	**140**	17	0.017	<100	0.56	0.017	0.58	8.1	9.7	6.2	0.4	1600	7.4	590	170	<1.0	1,000	16.7	2.77	0.378	0.132	7.02	7.27
	8-3-17	DRY - NO SAMPLE																												
	12-18-17	21000	2400	63000	9800	96	120	34	12	<0.010	<100	0.31	<0.010	0.31	0.06	<5.0	3.4	0.77	510	7.47	200	96	<1.0	320	5.37	4.07	-0.179	-0.428	7.65	7.89
	07-25-18	DRY - NO SAMPLE																												
	11-23-18	21000	2200	65000	9200	95	110	32	11	<0.010	<100	0.30	<0.010	0.30	0.065	6.2	2.2	1.1	520	7.41	200	94	<1.0	310	5.10	1.29	-0.229	-0.478	7.64	7.88
	07-29-19	DRY - NO SAMPLE																												
	12-13-19	21000	2100	69000	9000	98	120	34	11	<0.010	<100	0.29	<0.010	0.29	<0.050	<5.0	2.2	0.32	530	7.56	210	98	<1.0	330	5.44	2.74	-0.04	-0.289	7.60	7.85
	07-21-20	26000	1700	87000	11000	130	**140**	35	17	<0.010	<100	<0.050	<0.010	<0.050	<0.050	8	2.7	5.1	620	7.48	260	130	<1.0	400	6.51	0.7	0.086	-0.162	7.4	7.65
	12-01-20	28000	3000	78000	11000	110	**150**	43	11	<0.010	<100	0.25	<0.010	0.25	<0.050	<5.0	2.4	0.42	630	7.77	240	110	<1.0	390	6.44	2.88	0.248	0.000	7.53	7.77
	07-13-21	STANDING WATER/NO FLOW - NO SAMPLE																												
	12-16-21	27000	2700	87000	9800	95	**180**	36	13	0.039	<100	0.4	<0.010	0.4	0.071	<5.0	2.3	0.45	630	7.77	260	94	<1.0	410	6.63	1.84	0.229	-0.019	7.54	7.79
COB-4-SW	12-22-14	20000	1600	34000	3600	53	47	31	7.4	<0.010	<100	0.26	<0.010	0.26	0.057	12	3	1.5	300	7.70	99	52	<1.0	180	2.92	0.17	-0.431	-0.681	8.13	8.38
	07-27-15	37000	2900	60000	6300	94	100	58	8.5	<0.010	<100	0.31	0.013	0.33	<0.050	11	4.1	1.8	530	7.72	180	93	<1.0	330	5.65	4.15	0.036	-0.213	7.68	7.93
	11-18-15	21000	2800	33000	4600	58	41	33	7.5	0.012	390	0.18	<0.010	0.18	<0.050	14	9.3	140	310	7.56	100	58	<1.0	190	2.96	8.50	-0.540	-0.790	8.10	8.35
	07-22-16	34000	2400	55000	5300	98	74	54	9.2	0.015	<100	0.15	<0.010	0.15	<0.050	19	5.2	1.3	460	7.91	160	98	<1.0	300	5.06	3.27	0.223	-0.026	7.69	7.94
	07/22/16 [FD]	36000	2500	55000	5700	99	72	49	9.1	0.016	<100	0.15	<0.010	0.15	<0.050	18	4.8	1.2	460	7.85	160	99	<1.0	290	4.89	0.31	0.169	-0.081	7.68	7.93
	12-8-16	19000	1300	28000	2900	49	39	34	7.4	0.012	<100	0.27	<0.010	0.27	0.083	8.8	2.6	2.7	270	7.76	81	49	<1.0	160	2.79	5.08	-0.477	-0.727	8.24	8.49
	8-3-17	44000	3300	78000	7600	130	110	72	11	<0.010	<100	<0.010	**0.12**	0.12	0.061	<5.0	2.6	0.46	690	7.98	230	130	1.2	410	6.98	3.41	0.543	0.295	7.44	7.68
	8/3/17 [FD]	46000	3500	81000	7700	140	110	71	11	<0.010	<100	<0.010	**0.1**	0.1	0.11	<5.0	2.5	0.34	700	8.15	230	130	1.8	410	6.98	1.45	0.73	0.482	7.42	7.67
	12-18-17	20000	1200	28000	3000	45	42	32	7.8	<0.010	<100	0.22	<0.010	0.22	0.07	7.8	2.7	1.30	280	7.72	81	45	<1.0	160	2.71	3.24	-0.560	-0.810	8.28	8.53
	07-25-18	64000	2500	60000	5200	76	100	110	7.9	<0.010	<100	<0.05	<0.010	<0.05	<0.050	12	4.0	0.42	720	8.84	170	71	4.6	400	6.68	3.01	1.02	0.772	7.81	8.06
	11-23-18	56000	1800	38000	4200	73	41	97	7.1	<0.010	<100	0.26	<0.010	0.26	0.21	23	5.0	2.0	520	7.85	110	72	<1.0	290	5.07	3.79	-0.130	-0.379	7.98	8.23
	07-29-19	35000	1700	51000	5000	97	69	53	10	<0.010	<100	<0.010	**0.11**	0.11	0.074	18	4.1	1.4	470	7.80	150	96	<1.0	280	4.88	3.61	0.0810	-0.168	7.72	7.97
	12-13-19	20000	1100	29000	2900	52	43	35	8	<0.010	<100	0.2	<0.010	0.2	0.061	9.8	2.4	1.3	270	7.66	84	52	<1.0	170	2.93	5.97	-0.542	-0.792	8.20	8.45
	07-21-20	42000	2700	76000	7000	110	99	71	11	<0.010	<100	0.17	<0.010	0.17	0.075	9.6	3.6	0.68	640	7.69	220	110	<1.0	380	6.36	0.63	0.185	-0.064	7.5	7.75
	12-01-20	27000	1700	38000	4000	60	57	47	8.2	<0.010	<100	0.18	0.010	0.19	0.072	14	2.3	0.79	380	7.71	110	59	<1.0	220	3.72	3.62	-0.328	-0.578	8.04	8.29
	07-13-21	38000	2400	60000	6300	110	91	51	11	<0.010	<100	0.12	<0.010	0.12	0.067	8.7	3.5	2.6	570	7.75	180	110	<1.0	320	5.46	2.15	0.13	-0.119	7.63	7.87
	12-16-21	27000	1400	27000	3000	49	40	40	7.4	<0.010	<100	0.21	<0.010	0.21	0.1	11	4.4	54	300	7.73	80	49	<1.0	180	2.95	0.68	-0.525	-0.775	8.26	8.51

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NSE Tier 1 EQS Fresh Water [1]		5	9	5.0	1000	0.15	-	1500	0.09	8.9	1	2	300	1	430	0.026	73	25	1.0	0.25	21000	0.8	-	-	15	120	7
CCME FWAL [2]		100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [10]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	See Note [9]
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
COB-A-SW	07-23-13	**17.2**	<1.0	<1.0	56.2	*<1.0*	<2.0	415	0.015	<1.0	<0.40	<2.0	56	<0.50	27.9	NM	<2.0	<2.0	<1.0	<0.10	671	<0.10	<2.0	<2.0	2.14	<2.0	<5
	12-22-14	**16**	<1.0	<1.0	14	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	51	<0.50	25	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.38	<2.0	<5.0
	07-27-15	DRY - NO SAMPLE																									
	11-18-15	**5.1**	<1.0	<1.0	15	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	82	<0.50	74	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07-22-16	DRY - NO SAMPLE																									
	12-8-16	**8.5**	<1.0	<1.0	12	*<1.0*	<2.0	85	<0.010	<1.0	<0.40	<2.0	68	<0.50	92	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	DRY - NO SAMPLE																									
	07-25-18	**300**	<1.0	2.6	73	*<1.0*	<2.0	58	0.058	<1.0	**1.6**	**2.2**	**9100**	**1.4**	**2900**	<0.013	<2.0	3	<1.0	<0.10	270	<0.10	<2.0	4.6	0.5	<2.0	**14**
	11-23-18	**46**	<1.0	<1.0	16	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	**810**	<0.50	300	<0.013	<2.0	<2.0	<1.0	<0.10	210	<0.10	<2.0	2	0.31	<2.0	<5.0
	07-29-19	**10**	<1.0	<1.0	18	*<1.0*	<2.0	53	<0.010	<1.0	<0.40	<0.50	240	<0.50	290	<0.013	<2.0	<2.0	<1.0	<0.10	240	<0.10	<2.0	<2.0	0.49	<2.0	<5.0
	12-13-19	**7.5**	<1.0	<1.0	13	*<1.0*	<2.0	57	<0.010	<1.0	<0.40	<0.50	<50	<0.50	35	<0.013	<2.0	<2.0	<0.5	<0.10	220	<0.10	<2.0	<2.0	0.31	<2.0	<5.0
	07-21-20	DRY - NO SAMPLE																									
	12-01-20	STANDING WATER/NO FLOW - NO SAMPLE																									
	07-13-21	STANDING WATER/NO FLOW - NO SAMPLE																									
	12-16-21	**7.1**	<1.0	<1.0	13	<0.10	<2.0	57	<0.010	<1.0	<0.40	<0.50	53	<0.50	63	<0.013	<2.0	<2.0	<0.50	<0.10	210	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
COB-B-SW	07-27-15	DRY - NO SAMPLE																									
	11-18-15	**7.9**	<1.0	<1.0	18	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	<50	<0.50	21	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07-22-16	DRY - NO SAMPLE																									
	12-8-16	**13**	<1.0	<1.0	52	*<1.0*	<2.0	540	0.027	<1.0	0.90	<2.0	130	<0.50	**1400**	<0.013	<2.0	2.8	<1.0	<0.10	480	<0.10	<2.0	<2.0	0.68	<2.0	<5.0
	8-3-17	DRY - NO SAMPLE																									
	12-18-17	**6.7**	<1.0	<1.0	14	*<1.0*	<2.0	<50	<0.010	<1.0	0.42	<2.0	110	<0.50	490	<0.013	<2.0	<2.0	<1.0	<0.10	190	<0.10	<2.0	<2.0	0.18	<2.0	<5.0
	07-25-18	DRY - NO SAMPLE																									
	11-23-18	**7.0**	<1.0	<1.0	17	*<1.0*	<2.0	<50	<0.010	<1.0	0.46	<2.0	200	<0.50	**500**	<0.013	<2.0	<2.0	<1.0	<0.1	200	<0.10	<2.0	<2.0	0.27	<2.0	<5.0
	07-29-19	DRY - NO SAMPLE																									
	12-13-19	**6.1**	<1.0	<1.0	16	*<1.0*	<2.0	67	<0.010	<1.0	<0.40	<0.50	78	<0.50	190	<0.013	<2.0	<2.0	<0.5	<0.10	200	<0.10	<2.0	<2.0	0.29	<2.0	<5.0
	07-21-20	**6.0**	<1.0	<1.0	14	*<1.0*	<2.0	66	<0.010	<1.0	<0.40	<0.50	85	<0.50	210	<0.013	<2.0	<2.0	<0.5	<0.10	240	<0.10	<2.0	<2.0	0.45	<2.0	<5.0
	12-01-20	**6.4**	<1.0	<1.0	12	*<1.0*	<2.0	52	<0.010	<1.0	<0.40	<0.50	96	<0.50	210	<0.013	<2.0	<2.0	<0.50	<0.10	220	<0.10	<2.0	<2.0	0.36	<2.0	<5.0
	07-13-21	STANDING WATER/NO FLOW - NO SAMPLE																									
	12-16-21	**6.8**	<1.0	<1.0	17	<0.1	<2.0	78	<0.010	<1.0	<0.40	0.53	91	<0.50	400	<0.013	<2.0	<2.0	<0.50	<0.10	220	<0.10	<2.0	<2.0	0.39	<2.0	<5.0
COB-4-SW	12-22-14	**82**	<1.0	<1.0	20	*<1.0*	<2.0	<50	0.014	<1.0	<0.40	<2.0	210	<0.50	95	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	3.2	0.18	<2.0	**7.2**
	07-27-15	**51**	<1.0	<1.0	32	*<1.0*	<2.0	60	<0.010	<1.0	<0.40	<2.0	**460**	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	2.1	0.35	<2.0	**10**
	11-18-15	**7100**	<1.0	**13**	77	*<1.0*	<2.0	<50	**0.29**	8.0	**4.6**	**17**	**14000**	**37**	**1500**	**0.082**	<2.0	9.5	<1.0	<0.10	150	0.18	<2.0	200	0.53	14	**96**
	07-22-16	**28**	<1.0	<1.0	24	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	300	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	270	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
	07/22/16 [FD]	**42**	<1.0	<1.0	26	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	2	**310**	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	280	<0.10	<2.0	<2.0	0.33	<2.0	<5.0
	12-8-16	**120**	<1.0	<1.0	19	*<1.0*	<2.0	<50	0.014	<1.0	<0.40	<2.0	**390**	0.99	180	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.18	<2.0	<5.0
	8-3-17	**13**	<1.0	<1.0	36	*<1.0*	<2.0	58	0.011	<1.0	<0.40	<2.0	83	<0.50	120	<0.013	<2.0	<2.0	<1.0	<0.10	440	<0.10	<2.0	<2.0	0.5	<2.0	<5.0
	8/3/17 [FD]	**14**	<1.0	<1.0	37	*<1.0*	<2.0	63	<0.010	<1.0	<0.40	<2.0	83	<0.50	130	<0.013	<2.0	<2.0	<1.0	<0.10	450	<0.10	<2.0	<2.0	0.54	<2.0	<5.0
	12-18-17	**53**	<1.0	<1.0	18	*<1.0*	<2.0	<50	0.010	<1.0	<0.40	<2.0	270	<0.50	120	<0.013	<2.0	<2.0	<1.0	<0.10	110	<0.10	<2.0	<2.0	0.16	<2.0	5.1
	07-25-18	**43**	<1.0	1.0	33	*<1.0*	<2.0	57	<0.010	<1.0	<0.40	<2.0	51	0.75	23	<0.013	<2.0	<2.0	<1.0	<0.10	430	<0.10	<2.0	<2.0	0.48	<2.0	<5.0
	11-23-18	**140**	<1.0	<1.0	17	*<1.0*	<2.0	<50	0.014	<1.0	<0.40	2.0	230	0.55	99	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.6	0.27	<2.0	<5.0
	07-29-19	**28**	<1.0	<1.0	26	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	1.2	**370**	<0.50	150	<0.013	<2.0	<2.0	<1.0	<0.10	230	<0.10	<2.0	<2.0	0.35	<2.0	<5.0
	12-13-19	**35**	<1.0	<1.0	18	*<1.0*	<2.0	<50	0.015	<1.0	<0.40	0.70	170	<0.50	130	<0.013	<2.0	<2.0	<0.5	<0.10	110	<0.10	<2.0	<2.0	0.21	<2.0	<5.0
	07-21-20	**20**	<1.0	<1.0	33	*<1.0*	<2.0	54	<0.010	<1.0	<0.40	1.3	120	<0.50	220	<0.013	<2.0	<2.0	<0.5	<0.10	340	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	12-01-20	**41**	<1.0	<1.0	24	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	0.75	160	<0.50	160	<0.013	<2.0	<2.0	<0.5	<0.10	170	<0.10	<2.0	<2.0	0.17	<2.0	<5.0
	07-13-21	**58**	<1.0	<1.0	31	*<1.0*	<2.0	66	<0.010	<1.0	<0.40	**2.5**	250	<0.50	210	<0.013	<2.0	<2.0	<0.50	<0.10	270	<0.10	<2.0	<2.0	0.39	<2.0	5.8
	12-16-21	**1900**	<1.0	2.6	29	0.1	<2.0	<50	0.08	2.0	**1.7**	**3.0**	**2700**	**4.5**	**530**	<0.013	<2.0	2.8	<0.50	<0.10	100	<0.10	<2.0	35	0.29	3.2	**21**

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
Units		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	128	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COB-6-SW	07-23-13	69200	5110	98900	9820	81	**170**	110	11	<0.010	<100	0.35	<0.010	0.35	<0.05	7.2	2.4	0.38	890	8.36	290	79	1.7	520	8.18	4.1	0.78	0.532	7.58	7.83
	12-22-14	22000	1800	39000	3800	58	56	35	8.3	<0.010	<100	0.28	0.011	0.29	0.1	11	2.6	0.87	340	7.86	110	57	<1.0	200	3.33	0.76	-0.173	-0.423	8.04	8.29
	07-27-15	39000	2600	57000	5000	93	91	61	8.4	<0.010	<100	0.18	0.015	0.19	<0.050	10	3.7	0.98	520	8.46	160	91	2.5	320	5.5	4.46	0.75	0.501	7.71	7.96
	11-18-15	27000	2100	37000	3700	70	44	42	7.6	0.012	<100	0.16	<0.010	0.16	<0.050	10	3.7	4.9	360	7.96	110	69	<1.0	210	3.51	1.89	-0.023	-0.273	7.98	8.23
	07-22-16	40000	2400	55000	4700	99	64	67	8.2	0.015	<100	0.081	<0.010	0.081	<0.050	23	5.3	1	490	8.05	160	98	1.0	300	5.21	2.46	0.365	0.116	7.69	7.94
	12-8-16	26000	1700	34000	3400	60	41	53	7.9	0.014	<100	0.27	0.01	0.28	<0.050	12	2.9	3.4	340	7.87	100	60	<1.0	210	3.56	5.33	-0.203	-0.453	8.08	8.33
	8-3-17	74000	3300	61000	5300	72	110	**130**	9.9	<0.010	<100	<0.010	**0.082**	0.082	0.093	6.3	3.1	0.29	760	8.83	170	67	4.3	430	7.29	3.7	0.989	0.74	7.84	8.09
	12-18-17	26000	1600	34000	3400	60	48	44	8.4	<0.010	<100	0.26	<0.010	0.26	0.05	13	3.5	2.7	350	7.6	99	60	<1.0	200	3.46	4.22	-0.473	-0.723	8.08	8.33
	07-25-18	43000	2800	72000	6600	130	95	67	9.7	<0.010	<100	0.14	<0.010	0.14	<0.050	12	4.1	0.6	640	7.99	210	120	1.1	370	6.41	2.56	0.499	0.25	7.49	7.74
	11-23-18	44000	1500	33000	3400	56	45	76	7.6	<0.010	<100	0.20	<0.010	0.20	0.084	15	3.5	1.8	440	7.95	96	55	<1.0	240	4.19	3.71	-0.191	-0.440	8.14	8.39
	07-29-19	44000	2100	56000	4300	100	76	72	8.9	<0.010	<100	<0.010	**0.064**	0.06	<0.050	16	4.1	1.0	530	8.68	160	96	4.3	320	5.63	4.65	0.986	0.737	7.70	7.95
	12-13-19	29000	1600	36000	3400	68	49	54	8.3	<0.010	<100	0.24	0.013	0.25	0.058	13	3.2	2.8	370	7.78	100	67	<1.0	220	3.91	6.68	-0.228	-0.478	8.01	8.26
	07-21-20	60000	2900	77000	6300	120	110	96	8.1	<0.010	<100	0.056	<0.010	0.056	<0.050	12	3.7	0.52	750	8.28	220	120	2.1	440	7.42	2.42	0.78	0.531	7.5	7.75
	12-01-20	33000	1800	41000	4100	72	54	56	7.4	<0.010	<100	0.15	0.010	0.16	<0.050	9.8	<5.0**	2.3	430	7.88	120	71	<1.0	240	4.15	3.49	-0.0550	-0.305	7.94	8.19
	07-13-21	55000	3200	67000	5900	100	100	77	8.9	<0.010	<100	<0.050	<0.010	<0.050	0.086	8.9	4.0	0.71	670	8.00	190	100	<1.0	380	6.31	0.16	0.389	0.141	7.61	7.86
	12-16-21	36000	1800	35000	3400	63	49	57	8.2	<0.010	<100	0.27	0.016	0.29	0.24	16	3.4	6.7	400	7.95	100	62	<1.0	230	3.9	3.17	-0.104	-0.354	8.06	8.31
WB-1-SW	07-23-13	5750000	210000	323000	667000	83	**1500**	**11000**	2	<0.010	<1000	0.051	<0.010	0.051	0.2	9.6	<5	6	31000	7.65	3600	82	<1.0	19,000	330	0.43	0.178	-0.059	7.47	7.71
	12-22-14	12000	700	7500	1400	17	7.9	21	3.4	0.011	<100	0.14	<0.010	0.14	0.12	32	3.7	0.83	120	7.19	25	17	<1.0	65	1.1	2.33	-2.04	-2.29	9.23	9.48
	07-27-15	19000	860	12000	2200	28	10	32	3.6	0.023	<100	0.16	0.016	0.18	0.18	51	6.3	0.82	170	7.44	39	28	<1.0	98	1.68	0.00	-1.37	-1.62	8.82	9.07
	11/18/15[FD]	14000	760	9200	1600	23	8.3	26	3.9	0.012	<100	0.098	<0.010	0.098	<0.050	30	4.5	0.18	140	7.42	29	23	<1.0	77	1.36	6.25	-1.59	-1.84	9.01	9.26
	11-18-15	14000	760	9600	1600	23	8.3	24	3.9	0.012	<100	0.11	<0.010	0.11	<0.050	30	4.3	0.67	140	7.45	31	23	<1.0	77	1.32	3.13	-1.54	-1.79	8.99	9.24
	07-22-16	1600000	54000	79000	190000	62	**410**	**2900**	4.2	0.024	<100	0.22	0.021	0.24	0.084	37	16	2.2	8500	7.52	980	62	<1.0	5,300	92.8	2.21	-0.583	-0.823	8.11	8.35
	12/8/16[FD]	14000	770	9400	1700	22	8.5	24	3.7	0.03	<100	0.15	<0.010	0.15	0.13	26	3.7	1.1	140	7.29	30	22	<1.0	76	1.3	1.56	-1.71	-1.97	9.01	9.26
	12-8-16	14000	800	9700	1600	22	8.4	25	3.8	0.03	<100	0.15	<0.010	0.15	0.14	27	3.6	1.2	140	7.46	31	22	<1.0	77	1.33	3.1	-1.54	-1.79	9	9.25
	8-3-17	940000	35000	82000	110000	97	**230**	**1600**	5.2	<0.010	<100	<0.010	0.055	0.055	0.075	9	2.6	1.8	5900	7.73	660	96	<1.0	3,100	52	2.7	-0.088	-0.33	7.81	8.06
	12-18-17[FD]	11000	610	7400	1400	19	8.3	21	3.4	<0.010	<100	0.11	<0.010	0.11	<0.050	32	4.9	0.78	120	7.18	24	19	<1.0	66	1.16	7.91	-1.99	-2.24	9.17	9.42
	12-18-17	11000	590	7600	1400	19	8.0	21	3.4	<0.010	<100	0.11	<0.010	0.11	<0.050	30	4.8	0.75	110	7.28	25	19	<1.0	65	1.13	6.10	-1.88	-2.14	9.17	9.42
	07-25-18	220000	8500	33000	26000	63	71	**460**	4.0	<0.010	<100	0.16	0.013	0.17	0.051	21	4.3	1.3	1800	7.96	190	63	<1.0	870	15.8	7.17	-0.25	-0.497	8.21	8.46
	11-23-18	15000	820	7700	1600	17	6.5	26	3.0	<0.010	160	0.091	<0.010	0.091	<0.050	38	6.3	83	130	7.63	26	17	<1.0	75	1.21	4.35	-1.58	-1.83	9.21	9.47
	11-23-18 [FD]	15000	780	8000	1500	16	6.5	26	3.0	<0.010	<100	0.12	<0.010	0.12	0.41	39	6.2	50	130	7.29	26	16	<1.0	75	1.20	6.25	-1.93	-2.18	9.22	9.47
	07-29-19	33000	1500	16000	3900	35	14	67	4.0	<0.010	<100	<0.010	**0.091**	0.091	<0.050	43	5.3	0.79	300	7.55	55	35	<1.0	160	2.89	5.28	-1.09	-1.34	8.64	8.89
	07-29-19 [FD]	39000	1500	16000	4800	36	16	77	3.9	<0.010	<100	<0.010	**0.13**	0.13	<0.050	40	5.2	0.91	320	7.54	60	36	<1.0	180	3.23	4.70	-1.08	-1.33	8.62	8.87
	12-13-19	12000	500	6700	1300	16	6.6	23	3.2	<0.010	<100	0.1	<0.010	0.1	<0.050	33	3.9	1.3	110	7.22	22	16	<1.0	64	1.12	6.16	-2.08	-2.33	9.29	9.55
	12-13-19 [FD]	12000	490	6200	1200	16	7.5	24	3.2	<0.010	<100	0.098	<0.010	0.1	<0.050	31	3.9	1.1	110	7.13	21	16	<1.0	65	1.16	10.5	-2.19	-2.44	9.31	9.57
	07-21-20	1200000	47000	90000	150000	60	**330**	**2500**	4.3	<0.010	<100	0.086	<0.010	0.086	0.099	15	3.9	2	7700	7.59	860	60	<1.0	4,400	78.2	3.63	-0.451	-0.691	8.04	8.28
	12-01-20	13000	580	8100	1500	16	7.0	26	2.9	<0.010	<100	0.095	<0.010	0.095	<0.050	37	<5.0**	2.0	120	7.22	26	16	<1.0	69	1.20	4.35	-1.99	-2.24	9.21	9.46
	12-01-20[FD]	13000	580	8000	1500	18	7.5	26	3.2	<0.010	<100	0.098	<0.010	0.098	<0.050	38	5.4	5.1	130	7.29	26	18	<1.0	72	1.26	5.88	-1.89	-2.14	9.17	9.43
	07-13-21	100000	4000	17000	12000	34	32	**180**	3.7	<0.010	<100	0.095	<0.010	0.095	0.087	45	5.8	1.7	780	7.51	92	34	<1.0	370	6.46	0.23	-1.17	-1.42	8.69	8.93
	07-13-21[FD]	110000	4000	17000	13000	33	38	**180**	3.7	<0.010	<100	0.11	<0.010	0.11	0.064	41	5.9	1.4	760	7.57	94	33	<1.0	380	6.47	1.22	-1.13	-1.38	8.70	8.95
	2021-12-16	12000	480	6000	1100	16	6.7	20	5.5	<0.010	<100	0.081	<0.010	0.081	0.082	47	5.2	1.9	100	7.24	20	16	<1.0	62	1.02	3.55	-2.1	-2.35	9.34	9.59

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	NSE Tier 1 EQS Fresh Water [1]	5	9	5.0	1000	0.15	-	1500	0.09	8.9	1	2	300	1	430	0.026	73	25	1.0	0.25	21000	0.8	-	-	15	120	7
	CCME FWAL [2]	100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [10]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	See Note[9]
	Upstream Calculated 95% UCL	220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
	Pre-Construction/Baseline Calculated 95% UCL	-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
COB-6-SW	07-23-13	**65.7**	<1.0	1.0	66.6	*<1.0*	<2.0	66	<0.01	<1.0	<0.40	<2.0	61	<0.50	30.3	NM	<2.0	<2.0	<1.0	<0.10	645	<0.10	<2.0	<2.0	0.68	<2.0	<5
	12-22-14	**61**	<1.0	<1.0	22	*<1.0*	<2.0	<50	0.01	<1.0	<0.40	<2.0	170	<0.50	56	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	<2.0	0.22	<2.0	6.0
	07-27-15	**39**	<1.0	<1.0	29	*<1.0*	<2.0	52	<0.010	<1.0	<0.40	**2.2**	160	<0.50	23	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.34	<2.0	**7.4**
	11-18-15	**220**	<1.0	<1.0	21	*<1.0*	<2.0	<50	0.018	<1.0	<0.40	<2.0	**490**	**1.5**	79	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	4	0.22	<2.0	<5.0
	07-22-16	**46**	<1.0	1.0	26	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	180	<0.50	37	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.3	<2.0	<5.0
	12-8-16	**200**	<1.0	<1.0	21	*<1.0*	<2.0	<50	0.015	<1.0	<0.40	<2.0	**360**	1.0	110	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	3	0.23	<2.0	<5.0
	8-3-17	**42**	<1.0	1.3	38	*<1.0*	<2.0	59	0.011	<1.0	<0.40	<2.0	<50	<0.50	35	<0.013	<2.0	<2.0	<1.0	<0.10	500	<0.10	<2.0	<2.0	0.43	<2.0	<5.0
	12-18-17	**130**	<1.0	<1.0	20	*<1.0*	<2.0	<50	0.010	<1.0	<0.40	<2.0	260	<0.50	73	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	3.0	0.19	<2.0	<5.0
	07-25-18	**23**	<1.0	<1.0	35	*<1.0*	<2.0	62	<0.010	<1.0	<0.40	<2.0	140	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	350	<0.10	<2.0	<2.0	0.5	<2.0	<5.0
	11-23-18	**150**	<1.0	<1.0	20	*<1.0*	<2.0	<50	0.015	<1.0	<0.40	<2.0	**360**	0.87	130	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	4.8	0.22	<2.0	6.4
	07-29-19	**37**	<1.0	<1.0	25	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	1.2	130	<0.50	31	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.39	<2.0	<5.0
	12-13-19	**88**	<1.0	<1.0	19	*<1.0*	<2.0	<50	0.014	<1.0	<0.40	1.1	220	<0.50	88	<0.013	<2.0	<2.0	<0.5	<0.10	150	<0.10	<2.0	<2.0	0.24	<2.0	<5.0
	07-21-20	**32**	<1.0	<1.0	32	*<1.0*	<2.0	81	0.016	<1.0	<0.40	1.3	<50	<0.50	32	<0.013	<2.0	<2.0	<0.5	<0.10	430	<0.10	<2.0	<2.0	0.44	<2.0	<5.0
	12-01-20	**52**	<1.0	<1.0	21	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	1.1	120	<0.50	56	<0.013	<2.0	<2.0	<0.50	<0.10	180	<0.10	<2.0	<2.0	0.22	<2.0	<5.0
	07-13-21	**34**	<1.0	<1.0	29	*<1.0*	<2.0	93	<0.010	<1.0	<0.40	1.7	68	<0.50	32	<0.013	<2.0	<2.0	<0.50	<0.10	340	<0.10	<2.0	<2.0	0.45	<2.0	<5.0
	12-16-21	**160**	<1.0	<1.0	20	<0.10	<2.0	53	0.018	<1.0	<0.40	1.3	**370**	0.55	130	<0.013	<2.0	<2.0	<0.50	<0.10	150	<0.10	<2.0	3.8	0.26	<2.0	5.7
WB-1-SW	07-23-13	*<50*	*<10*	*<10*	280	*<10*	<20	**2470**	**0.6**	*<10*	*<4.0*	*<20*	**936**	*<5*	**1920**	NM	<20	<20	*<10*	*<1.0*	4660	*<1*	<20	<20	1.6	<20	*<50*
	12-22-14	**180**	<1.0	<1.0	15	*<1.0*	<2.0	<50	0.038	<1.0	<0.40	<2.0	270	0.71	95	<0.013	<2.0	<2.0	<1.0	<0.10	53	<0.10	<2.0	4.6	<0.10	<2.0	**10**
	07-27-15	**89**	<1.0	<1.0	18	*<1.0*	<2.0	<50	0.012	<1.0	<0.40	<2.0	**480**	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	100	<0.10	<2.0	<2.0	<0.10	<2.0	**7.9**
	11/18/15 [FD]	**63**	<1.0	<1.0	15	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	70	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	11-18-15	**63**	<1.0	<1.0	15	*<1.0*	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	43	<0.013	<2.0	<2.0	<1.0	<0.10	73	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	07-22-16	**87**	<1.0	<1.0	39	*<1.0*	<2.0	690	0.035	<1.0	<0.40	<2.0	**590**	0.56	160	<0.013	<2.0	<2.0	<1.0	<0.10	1300	<0.10	<2.0	<2.0	0.47	<2.0	**11**
	12/8/16 [FD]	**140**	<1.0	<1.0	15	*<1.0*	<2.0	<50	0.025	<1.0	<0.40	<2.0	220	<0.50	98	<0.013	<2.0	<2.0	<1.0	<0.10	59	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	12-8-16	**100**	<1.0	<1.0	16	*<1.0*	<2.0	<50	0.026	<1.0	<0.40	<2.0	220	<0.50	100	<0.013	<2.0	<2.0	<1.0	<0.10	61	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	8-3-17	**28**	<1.0	1.0	73	*<1.0*	<2.0	430	0.027	<1.0	<0.40	<2.0	**680**	<0.50	**450**	<0.013	<2.0	<2.0	<1.0	<0.10	940	<0.10	<2.0	<2.0	0.43	<2.0	<5.0
	12-18-17 [FD]	**110**	<1.0	<1.0	12	*<1.0*	<2.0	<50	0.027	<1.0	<0.40	<2.0	190	<0.50	62	<0.013	<2.0	<2.0	<1.0	<0.10	48	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	12-18-17	**110**	<1.0	<1.0	12	*<1.0*	<2.0	<50	0.022	<1.0	<0.40	<2.0	190	<0.50	63	<0.013	<2.0	<2.0	<1.0	<0.10	49	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	07-25-18	**120**	<1.0	<1.0	35	*<1.0*	<2.0	110	0.024	<1.0	<0.40	**4.7**	**330**	**1.8**	140	<0.013	<2.0	<2.0	<1.0	<0.1	320	<0.10	<2.0	2.7	0.18	<2.0	6.0
	11-23-18	**1800**	<1.0	4.3	37	*<1.0*	<2.0	<50	**0.14**	3.5	**1.2**	**9.7**	**3500**	**29**	210	**0.037**	<2.0	2.8	<1.0	**1.7**	50	<0.10	<2.0	25	0.17	6.8	**79**
	11-23-18 [FD]	**1200**	<1.0	3.9	40	*<1.0*	<2.0	<50	**0.15**	3.3	**1.2**	**9.2**	**3700**	**28**	200	**0.033**	<2.0	2.3	<1.0	**1.5**	50	<0.10	<2.0	23	0.15	5.2	**160**
	07-29-19	**69**	<1.0	<1.0	20	*<1.0*	<2.0	<50	0.020	<1.0	<0.40	0.94	290	<0.50	64	<0.013	<2.0	<2.0	<1.0	<0.10	120	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	07-29-19 [FD]	**71**	<1.0	<1.0	21	*<1.0*	<2.0	<50	0.021	<1.0	<0.40	0.89	**310**	<0.50	71	<0.013	<2.0	<2.0	<1.0	<0.10	120	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	12-13-19	**110**	<1.0	<1.0	12	*<1.0*	<2.0	<50	0.027	<1.0	<0.40	<0.50	210	<0.50	67	<0.013	<2.0	<2.0	<0.5	<0.10	39	<0.10	<2.0	<2.0	<0.10	<2.0	5.0
	12-13-19 [FD]	**110**	<1.0	<1.0	11	*<1.0*	<2.0	<50	0.029	<1.0	<0.40	<0.50	180	<0.50	61	<0.013	<2.0	<2.0	<0.5	<0.10	37	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	07-21-20	**55**	<1.0	<1.0	95	*<1.0*	<2.0	550	0.087	<1.0	<0.40	1.8	**420**	<0.50	**610**	<0.013	<2.0	<2.0	<0.5	<0.10	1200	<0.10	<2.0	<2.0	0.39	<2.0	6.9
	12-01-20	**110**	<1.0	<1.0	14	*<1.0*	<2.0	<50	0.027	<1.0	<0.40	0.71	**330**	<0.50	69	<0.013	<2.0	<2.0	<0.50	<0.10	57	<0.10	<2.0	2.4	<0.10	<2.0	**7.1**
	12-01-20 [FD]	**97**	<1.0	<1.0	14	*<1.0*	<2.0	<50	0.013	<1.0	<0.40	0.65	300	<0.50	65	<0.013	<2.0	<2.0	<0.50	<0.10	58	<0.10	<2.0	<2.0	<0.10	<2.0	*<5.0*
	07-13-21	**87**	<1.0	<1.0	20	*<1.0*	<2.0	53	0.022	<1.0	<0.40	1.2	**590**	0.74	68	<0.013	<2.0	<2.0	<0.50	<0.10	160	<0.10	<2.0	<2.0	<0.10	<2.0	6.9
	07-13-21 [FD]	**72**	<1.0	<1.0	21	*<1.0*	<2.0	52	0.024	<1.0	<0.40	1.1	**560**	0.65	65	<0.013	<2.0	<2.0	<0.50	<0.10	160	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	2021-12-16	**180**	<1.0	<1.0	10	<0.10	<2.0	<50	0.035	<1.0	<0.40	0.72	280	<0.50	83	<0.013	<2.0	<2.0	<0.50	<0.10	33	<0.10	<2.0	2.6	<0.10	<2.0	*<5.0*

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_ pH (@20C)	Sat_ pH (@4C)
Units		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**TCU**	**mg/L**	**NTU**	**µS/cm**	**pH**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**me/L**	**%**	**unitless**	**unitless**	**unitless**	**unitless**
NSE Tier 1 EQS Fresh Water [1]		-	-	-	-	-	128	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
CCME FWAL [2]		-	-	-	-	-	-	120	-	-	-	13	0.06	-	8.47 [3]	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NSE Tier 1 EQS Marine Water [1]		-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME MAL [2]		-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	-	-	-	7.0-8.7	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	2180	-	-	-	-	-	-	-	-	-	-	88	-	-	-	-	-	-	-	-	-	-	-	-
BP-1-SW	11-26-12	2500000	84000	130000	300000	68	650	4400	5.8	0.011	<100	0.17	0.02	0.19	0.091	14	<5	29	15000	7.8	1600	67	<1	8,190	140	1.16	-0.131	-0.37	7.93	8.17
	11/26/12 [FL]	2600000	98000	130000	330000	NM	NM	NM	6.7	NM	<100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	11/26/12 [F]	2400000	110000	150000	350000	64	660	4500	6.1	0.011	<100	0.16	0.02	0.18	0.13	14	<5	19	14000	7.8	1800	64	<1	8,230	143	0.07	-0.083	-0.321	7.88	8.12
	07-23-13	8480000	304000	343000	1000000	84	2000	14000	<0.5	<0.010	<1000	<0.05	<0.010	<0.05	<0.05	<5	<5	7.2	41000	8.07	5000	83	<1.0	26000	434	4.66	0.664	0.425	7.41	7.65
	12-22-14	1000000	38000	68000	120000	56	270	1900	5.5	0.012	<100	0.19	0.019	0.21	0.11	18	2.3	1.1	6300	8.42	680	54	1.3	3,500	60.8	1.58	0.248	0.007	8.17	8.41
	07-27-15	7100000	260000	300000	870000	88	1500	13000	1.1	0.018	<1000	0.11	0.011	0.12	0.05	6.8	<5.0	0.6	37000	7.83	4300	87	<1.0	23,000	393	0.97	0.369	0.131	7.46	7.7
	11-18-15	650000	27000	52000	71000	58	190	1200	5.4	0.015	<100	0.14	<0.010	0.14	0.064	25	3.3	1.0	4200	8.00	420	57	<1.0	2,200	38.8	1.80	-0.189	-0.432	8.19	8.44
	07-22-16	7500000	280000	300000	910000	92	1600	13000	1	0.026	<1000	0.092	0.01	0.1	0.088	8.3	<5.0	1.2	36000	7.99	4500	91	<1.0	24,000	411	1.77	0.559	0.321	7.43	7.67
	12-8-16	1200000	45000	70000	150000	52	290	2300	4.8	0.015	<100	0.21	<0.010	0.21	0.088	20	<5.0	2.1	7000	7.56	780	52	<1.0	4,100	72.9	3.02	-0.642	-0.883	8.2	8.44
	8-3-17	8400000	300000	340000	1000000	98	2000	13000	0.78	0.01	<1000	<0.010	0.057	0.057	0.13	<5.0	<5.0	1.5	40000	8.05	5000	97	1	25,000	405	7.68	0.698	0.46	7.35	7.59
	12-18-17	720000	28000	50000	85000	52	210	1300	5.4	0.011	<100	0.20	<0.010	0.20	0.098	21	3.5	1.6	4500	8.10	480	52	<1.0	2,400	42	0.51	-0.166	-0.409	8.26	8.51
	07-25-18	8300000	290000	330000	980000	98	1900	12000	0.81	0.022	<1000	0.051	0.012	0.063	0.076	9	2.4	1.1	39,000	8.14	4800	96	1.3	24,000	377	10.3	0.767	0.529	7.37	7.61
	11-23-18	860000	33,000	62000	98000	60	250	1600	5	<0.010	<100	0.16	0.011	0.17	0.075	24	3.9	1.8	5500	8.74	560	56	2.9	3,000	52.7	3.16	0.573	0.331	8.17	8.41
	07-29-19	6900000	250,000	280000	860000	94	1700	12000	0.69	<0.010	<1000	<0.010	<0.050	<0.050	0.060	8.7	2.6	0.96	36000	8.26	4200	92	1.6	22,000	382	1.23	0.788	0.55	7.47	7.71
	12-13-19	800000	30000	55000	92000	57	250	1600	5.2	<0.010	<100	0.16	0.016	0.18	0.068	16	3.5	2.6	5100	8.68	520	55	<1.0	2,900	51.3	5.67	0.452	0.21	8.23	8.47
	07-21-20	6700000	270000	310000	850000	92	2100	14000	0.71	<0.010	<1000	<0.050	<0.010	<0.050	0.09	8.1	2.1	0.84	39000	7.95	4300	91	<1.0	25,000	447	7.45	0.53	0.292	7.42	7.66
	12-01-20	7900000	280000	320000	960000	91	2100	15000	1.0	0.015	<1000	0.068	0.013	0.081	0.080	<5.0	1.7	0.74	39000	7.58	4700	91	<1.0	27,000	472	3.14	0.185	-0.0530	7.40	7.63
	07-13-21	6600000	250000	270000	800000	91	1900	12000	1.8	<0.010	<1000	0.053	<0.010	0.053	0.11	7.5	2.9	0.98	36000	7.82	4000	90	<1.0	21,000	367	0.910	0.317	0.0790	7.51	7.74
	12-16-21	860000	31000	58000	99000	52	260	1600	5.3	<0.010	<100	0.17	<0.010	0.17	0.082	29	4.3	3.2	5200	8.13	550	52	<1.0	3,000	52.5	3.320	-0.104	-0.3460	8.23	8.47
NARROWS	12-22-14	600000	24000	58000	74000	57	170	1100	5.6	0.013	<100	0.22	0.016	0.24	0.11	16	2	1	3900	8.56	450	55	1.9	2,100	36	0.1	0.403	0.16	8.15	8.4
	07-27-15	7200000	270000	300000	900000	91	1300	13000	1.2	<0.010	<1000	0.067	<0.010	0.067	0.067	7.4	<5.0	0.36	37000	7.96	4400	90	<1.0	23,000	383	3.36	0.502	0.265	7.45	7.69
	11-18-15	330000	15000	38000	36000	55	110	640	5.8	0.016	<100	0.15	<0.010	0.15	0.053	21	3.7	1.7	2400	7.86	240	55	<1.0	1,200	21.6	4.13	-0.398	-0.643	8.26	8.50
	07-22-16	7500000	270000	300000	900000	93	1400	12000	1.3	0.017	<1000	0.05	0.01	0.06	0.08	9.9	2.3	1.2	36000	7.97	4400	92	<1.0	23,000	378	5.2	0.533	0.295	7.44	7.68
	12-8-16	1000000	38000	72000	130000	61	270	1900	6.1	0.016	<100	0.21	<0.010	0.21	0.082	21	<5.0	1.2	6200	7.67	700	61	<1.0	3,500	60.8	0.65	-0.418	-0.66	8.09	8.33
	8-3-17	8300000	300000	340000	990000	97	2000	12000	1.1	0.016	<1000	<0.010	0.077	0.077	0.21	<5.0	<5.0	1.4	40000	7.8	4900	97	<1.0	24,000	392	8.83	0.45	0.213	7.36	7.59
	12-18-17	440000	18000	45000	53000	52	150	820	6.0	0.010	<100	0.21	<0.010	0.21	0.076	21	3.5	2.1	2900	7.82	330	52	<1.0	1,600	27	2.06	-0.428	-0.672	8.25	8.49
	07-25-18	6600000	240000	300000	780000	97	1700	11000	2.0	0.018	<1000	0.064	0.012	0.076	0.09	8.3	<5	0.73	34000	8.08	3900	96	1.1	20,000	334	5.38	0.641	0.404	7.44	7.68
	11-23-18	530000	21,000	50000	60000	58	180	1100	5.3	<0.010	<100	0.18	<0.010	0.18	0.076	28	4.1	1.7	3700	8.78	370	54	3.1	1,900	34.5	5.13	0.574	0.331	8.21	8.45
	07-29-19	6800000	250,000	280000	850000	93	1700	12000	1.3	<0.010	<1000	<0.010	<0.050	<0.050	0.088	7.8	<5.0 *	1.4	35000	7.88	4200	93	<1.0	22,000	376	1.51	0.415	0.177	7.47	7.70
	12-13-19	350000	14000	36000	43000	45	120	660	5.2	<0.010	<100	0.14	0.017	0.15	0.056	27	3.7	2.3	2300	8.13	270	45	<1.0	1,300	22.2	2.5	-0.246	-0.491	8.38	8.62
	07-21-20	6800000	270000	310000	880000	95	2100	14000	1.3	<0.010	<1000	<0.050	<0.010	<0.050	0.075	7.1	2.3	1.1	38000	7.91	4400	94	<1.0	25,000	443	6.12	0.503	0.265	7.41	7.64
	07-21-20 [FD]	6500000	260000	290000	840000	95	2100	14000	1.2	<0.010	<1000	<0.050	<0.010	<0.050	0.078	7.2	2.2	1.8	38000	7.93	4200	94	<1.0	24,000	435	7.67	0.493	0.256	7.43	7.67
	12-01-20	6300000	230000	260000	770000	86	1700	10000	1.6	0.012	<1000	0.085	0.013	0.098	0.074	5.6	3.7	0.59	35000	7.83	3800	86	<1.0	20,000	331	3.62	0.284	0.0470	7.55	7.79
	07-13-21	5700000	210000	240000	680000	95	1700	11000	2.4	<0.010	<1000	0.082	<0.010	0.082	0.13	8.4	2.8	0.81	35000	7.73	3400	95	<1.0	19,000	336	2.39	0.198	-0.0390	7.53	7.77
	12-16-21	580000	22000	63000	68000	76	250	910	7.8	<0.010	<100	0.17	<0.010	0.17	0.11	28	4.0	3.0	3600	7.85	440	76	<1.0	1,900	32.3	3.07	-0.119	-0.3630	7.97	8.21

TABLE B-2
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - FALL 2021
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS

Sample Location	Sample Date	Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Sr	Tl	Sn	Ti	U	V	Zn
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NSE Tier 1 EQS Fresh Water [1]		5	9	5.0	1000	0.15	-	1500	0.09	8.9	1	2	300	1	430	0.026	73	25	1.0	0.25	21000	0.8	-	-	15	120	7
CCME FWAL [2]		100 [5]	-	5	-	-	-	1500	0.09 [6]	1 [4]	-	2 [10]	300	1 [7]	-	0.026	73	25 [8]	1	0.25	-	0.8	-	-	15	-	See Note [9]
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	-	210	-	-	-	-	-	-
NSE Tier 1 EQS Marine Water [1]		-	250	12.5	500	100	-	1200	0.12	56	4	2	-	2	-	0.016	1000	8.3	2	1.5	-	0.3	-	-	8.5	5	10
CCME MAL [2]		-	-	12.5	-	-	-	-	0.12	1.5 [4]	-	-	-	-	-	0.016	-	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	-	-	-	-	0.9	-	190	-	70	0.189	-	-	-	-	7000	-	-	-	-	-	-
BP-1-SW	11-26-12	310	<1	6.3	47	<0.5	<2	1200	0.053	1	*<1*	<2	310	1.2	100	0.017	<4	<3	7	2.4	2300	*<0.8*	<20	5.5	0.98	<2	5.4
	11/26/12 [FL]	530	<1	6.4	53	<0.5	<2	1200	0.054	1.5	*<1*	<2	650	1.5	120	NM	<4	<3	6	1.8	2300	*<0.8*	<20	12	0.99	<2	6.9
	11/26/12 [F]	350	<1	6.2	49	<0.5	<2	1200	0.052	2	*<1*	<2	340	1.3	110	0.018	<4	<3	5.7	2	2300	*<0.8*	<20	6.6	0.97	<2	6.2
	07-23-13	168	<10	<10	41	<10	<20	3700	0.14	*<10*	*<4.0*	*<20*	1990	*<5.0*	109	<0.013	<20	*<20*	*<10*	<1.0	6130	*<1*	<20	<20	2.6	*<20*	*<50*
	12-22-14	110	<1.0	<1.0	19	<1.0	<2.0	480	0.028	<1.0	<0.40	<2.0	240	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	950	<0.10	<2.0	<2.0	0.41	<2.0	7.2
	07-27-15	86	<10	<10	19	<10	<20	2900	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	59	<0.013	<20	*<20*	*<10*	<1.0	5300	*<1.0*	<20	<20	2.1	*<20*	*<50*
	11-18-15	140	<1.0	<1.0	16	<1.0	<2.0	330	0.014	<1.0	<0.40	<2.0	410	<0.50	57	0.07	<2.0	<2.0	*<1.0*	<0.10	580	<0.10	<2.0	<2.0	0.29	<2.0	41
	07-22-16	63	<10	<10	23	<10	<20	3600	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	71	<0.013	<20	*<20*	*<10*	<1.0	5500	*<1.0*	<20	<20	2.4	*<20*	*<50*
	12-8-16	86	<1.0	<1.0	20	<1.0	<2.0	520	0.025	<1.0	<0.40	<2.0	280	<0.50	100	<0.013	<2.0	<2.0	<1.0	<0.10	1000	<0.10	<2.0	<2.0	0.48	<2.0	<5.0
	8-3-17	<50	<10	<10	25	<10	<20	3600	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<10*	<1.0	6100	*<1.0*	<20	<20	2.5	*<20*	*<50*
	12-18-17	95	<1.0	<1.0	17	<1.0	<2.0	340	0.020	<1.0	<0.40	<2.0	220	<0.50	60	<0.013	<2.0	<2.0	<1.0	<0.10	630	<0.10	<2.0	3.6	0.35	<2.0	<5.0
	07-25-18	58	<10	<10	23	<10	<20	3500	<0.10	*<10*	*<4.0*	*<20*	1000	*<5.0*	94	<0.013	<20	*<20*	*<10*	<1.0	5900	*<1.0*	<20	<20	2.5	*<20*	*<50*
	11-23-18	86	<1.0	<1.0	18	<1.0	<2.0	420	0.024	<1.0	<0.40	<2.0	240	<0.50	50	<0.013	<2.0	<2.0	<1.0	<0.10	730	<0.10	<2.0	<2.0	0.4	<2.0	<5.0
	07-29-19	<50	<10	<10	18	<10	<20	3100	<0.10	*<10*	*<4.0*	5.6	*<500*	*<5.0*	50	<0.013	<20	*<20*	*<10*	<1.0	5000	*<1.0*	<20	<20	2.4	*<20*	*<50*
	12-13-19	88	<1.0	<1.0	13	<1.0	<2.0	360	0.021	<1.0	<0.40	0.96	220	<0.50	51	<0.013	<2.0	<2.0	<0.5	<0.10	340	<0.10	<2.0	<2.0	0.35	<2.0	<5.0
	07-21-20	63	<1.0	<1.0	19	<1.0	<20	3200	0.11	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	44	<0.013	<20	*<20*	*<5.0*	<1.0	5500	*<1.0*	<20	<20	2.3	*<20*	*<50*
	12-01-20	<50	<10	<10	12	<10	<20	3600	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	22	0.015	<20	*<20*	*<5.0*	<1.0	5600	*<1.0*	<20	<20	2.5	*<20*	*<50*
	07-13-21	<50	<10	<10	23	<10	<20	2900	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	150	<0.013	<20	*<20*	*<5.0*	<1.0	4800	*<1.0*	<20	<20	2.0	*<20*	*<50*
	12-16-21	130	<1.0	<1.0	16	<0.10	<2.0	380	0.028	<1.0	<0.40	0.88	290	<0.50	71	<0.013	<2.0	<2.0	<0.50	<0.10	670	<0.10	<2.0	<2.0	0.4	<2.0	6.7
NARROWS	12-22-14	110	<1.0	<1.0	19	<1.0	<2.0	300	0.027	<1.0	<0.40	<2.0	250	<0.50	63	<0.013	<2.0	<2.0	<1.0	<0.10	610	<0.10	<2.0	2.4	0.32	<2.0	7.3
	07-27-15	140	<10	<10	21	<10	<20	3100	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	100	<0.013	<20	*<20*	*<10*	<1.0	5400	*<1.0*	<20	<20	2.2	*<20*	*<50*
	11-18-15	76	1.8	<1.0	15	<1.0	<2.0	180	0.012	<1.0	<0.40	<2.0	320	<0.50	45	<0.013	<2.0	<2.0	*<1.0*	<0.10	370	<0.10	<2.0	<2.0	0.22	<2.0	63
	07-22-16	51	<10	<10	28	<10	<20	3500	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<10*	<1.0	5400	*<1.0*	<20	<20	2.1	*<20*	*<50*
	12-8-16	75	<1.0	<1.0	20	<1.0	<2.0	460	0.029	<1.0	<0.40	<2.0	250	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	890	<0.10	<2.0	<2.0	0.58	<2.0	15
	8-3-17	<50	<10	<10	26	<10	<20	3600	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<10*	<1.0	6100	*<1.0*	<20	<20	2.4	*<20*	*<50*
	12-18-17	110	<1.0	<1.0	17	<1.0	<2.0	210	0.018	<1.0	<0.40	<2.0	280	<0.50	72	<0.013	<2.0	<2.0	<1.0	<0.10	450	<0.10	<2.0	3.6	0.27	<2.0	5.8
	07-25-18	56	<10	<10	29	<10	<20	2800	<0.10	*<10*	*<4.0*	*<20*	*<500*	*<5.0*	100	<0.013	<20	*<20*	*<10*	<1.0	5000	*<1.0*	<20	<20	2	*<20*	*<50*
	11-23-18	86	<1.0	<1.0	17	<1.0	<2.0	260	0.021	<1.0	<0.40	<2.0	220	<0.50	52	<0.013	<2.0	<2.0	<1.0	<0.10	500	<0.10	<2.0	<2.0	0.32	<2.0	8.8
	07-29-19	110	<10	<10	21	<10	<20	3000	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<10*	<1.0	5000	*<1.0*	<20	<20	2.0	*<20*	*<50*
	12-13-19	110	<1.0	<1.0	15	<1.0	<2.0	180	0.021	<1.0	<0.40	2.7	290	<0.50	65	<0.013	<2.0	<2.0	<0.5	<0.10	660	<0.10	<2.0	<2.0	0.22	<2.0	7.2
	07-21-20	66	<10	<10	24	<10	<20	3200	0.13	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	120	<0.013	<20	*<20*	*<5.0*	<1.0	5600	*<1.0*	<20	<20	2.5	*<20*	*<50*
	07-21-20 [FD]	67	<10	<10	20	<10	<20	3100	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	110	<0.013	<20	*<20*	*<5.0*	<1.0	5300	*<1.0*	<20	<20	2.2	*<20*	*<50*
	12-01-20	<50	<10	<10	15	<10	<20	2600	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	38	<0.013	<20	*<20*	*<5.0*	<1.0	4500	*<1.0*	<20	<20	1.9	*<20*	*<50*
	07-13-21	<50	<10	<10	23	<10	<20	2500	<0.10	*<10*	*<4.0*	*<5.0*	*<500*	*<5.0*	92	<0.013	<20	*<20*	*<5.0*	<1.0	4100	*<1.0*	<20	<20	1.8	*<20*	*<50*
	12-16-21	130	<1.0	<1.0	16	<0.10	<2.0	280	0.052	<1.0	<0.40	1.1	290	<0.50	70	<0.013	<2.0	<2.0	<0.50	<0.10	580	<0.10	<2.0	2.5	0.46	<2.0	53

NOTES:
FD - Field Duplicate
NM - Not Measured or not analyzed
mg/L - milligrams per liter
UCL - Upper Concentration Limit
- No applicable guideline criteria
* Elevated reporting limit due to sample matrix
** Elevated reporting limit due to turbidity

1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) September 2021.

2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) accessed online January 2022.

3 - Guideline value for NH3 is based on a pH value of 8 and a temperature of 10 C

4 - Guideline for chromium is based on CR6+

5 - Guideline value for aluminum based on a pH >6.5

6 - CCME FWAL guideline values for cadmium is based on a hardness value. At hardness ≥ 17 to ≤ 280 mg/L, the CWQG is calculated using this equation CWQG (µg/L) = $10^{(0.83[\ln(\text{hardness})]-2.46)}$ The CWQG for cadmium (i.e. long-term guideline) of 0.09 µg·L-1 is for waters of 50 mg CaCO3·L-1 hardness.

7 - CCME FWAL guideline value for lead is based on a hardness value. At hardness >60 to <180 mg/L the CWQG is calculated using this equation: CWQG (µg/L)= $e^{(1.273[\ln(\text{hardness})]+4.705)}$ If value is unknown, the guideline is 1µg/L

8 - CCME FWAL guideline value for nickle is based on a hardness value. At hardness > 60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = $e^{(0.76[\ln(\text{hardness})]+1.06)}$ If value is unknown, the guideline is 25µg/L.

9. - The long-term CWQG for zinc is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625). A DOC value of 0.3 was used.
The CWQG equation is valid between hardness 23.4 and 399 mg CaCO3·L−1, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L−1. DOC is not not part of the analytical package, therefore the most conservative value is used.

10 - CCME FWAL guideline values for copper are related to water hardness (as CaCO3). At hardness >82 to <180 mg/L the CWQG is calculated using this equation CWQG (ug/L) = 0.2 * $e^{(0.8545[\ln(\text{hardness})]-1.465)}$ If the hardness is unknown, the CWQG is 2 ug/L

Bold Concentration exceeds Tier I EQS for surface water (freshwater)
Underline Concentration exceeds Tier I EQS for surface water (marine)
Shading Concentration exceeds CCME FWAL
Shading Concentration exceeds CCME MAL
Double Underline Concentration exceeds Upstream Calculated 95% UCL
Dashed Border Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit
Red Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit
italics Laboratory detection limit is higher than guideline criteria
This summary is to be used in conjunction with, not as a replacement of, the Laboratory Certificates of Analysis

Appendix C

Laboratory Certificate

Site Location: NS LANDS SW PROGRAM
Your C.O.C. #: 856956-01-01, 856956-02-01

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2022/01/19
Report #: R6967796
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1AE942
Received: 2021/12/16, 14:38

Sample Matrix: Surface Water
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonate, Bicarbonate and Hydroxide (1)	11	N/A	2022/01/06	N/A	SM 23 4500-CO2 D
Alkalinity (1)	8	N/A	2022/01/10	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity (1)	2	N/A	2022/01/11	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity (1)	1	N/A	2022/01/08	ATL SOP 00013	EPA 310.2 R1974 m
Benzo(b/j)fluoranthene Sum (water) (1)	2	N/A	2022/01/05	N/A	Auto Calc.
Chloride (1)	8	N/A	2022/01/10	ATL SOP 00014	SM 23 4500-Cl- E m
Chloride (1)	2	N/A	2022/01/11	ATL SOP 00014	SM 23 4500-Cl- E m
Chloride (1)	1	N/A	2022/01/07	ATL SOP 00014	SM 23 4500-Cl- E m
Colour (1)	10	N/A	2022/01/10	ATL SOP 00020	SM 23 2120C m
Colour (1)	1	N/A	2022/01/07	ATL SOP 00020	SM 23 2120C m
Conductance - water (1)	11	N/A	2022/01/06	ATL SOP 00004	SM 23 2510B m
Hardness (calculated as CaCO3) (1)	1	N/A	2022/01/04	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3) (1)	1	N/A	2021/12/30	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3) (1)	9	N/A	2021/12/31	ATL SOP 00048	Auto Calc
Mercury - Total (CVAA,LL) (1)	11	2022/01/13	2022/01/14	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS (1)	1	2021/12/29	2021/12/29	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS (1)	9	2021/12/29	2021/12/30	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS (1)	1	2021/12/29	2021/12/31	ATL SOP 00058	EPA 6020B R2 m
Ion Balance (% Difference) (1)	10	N/A	2022/01/14	N/A	Auto Calc.
Ion Balance (% Difference) (1)	1	N/A	2022/01/17	N/A	Auto Calc.
Anion and Cation Sum (1)	11	N/A	2022/01/07	N/A	Auto Calc.
Nitrogen Ammonia - water (1)	11	N/A	2022/01/06	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite (1)	10	N/A	2022/01/10	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrate + Nitrite (1)	1	N/A	2022/01/07	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite (1)	10	N/A	2022/01/10	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrite (1)	1	N/A	2022/01/07	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N) (1)	10	N/A	2022/01/14	ATL SOP 00018	ASTM D3867-16
Nitrogen - Nitrate (as N) (1)	1	N/A	2022/01/17	ATL SOP 00018	ASTM D3867-16
PAH in Water by GC/MS (SIM) (1)	2	2021/12/21	2021/12/31	ATL SOP 00103	EPA 8270E R6 m
pH (1, 2)	11	N/A	2022/01/06	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho (1)	10	N/A	2022/01/10	ATL SOP 00021	SM 23 4500-P E m
Phosphorus - ortho (1)	1	N/A	2022/01/08	ATL SOP 00021	SM 23 4500-P E m

Site Location: NS LANDS SW PROGRAM
Your C.O.C. #: 856956-01-01, 856956-02-01

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2022/01/19
Report #: R6967796
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1AE942
Received: 2021/12/16, 14:38

Sample Matrix: Surface Water
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sat. pH and Langelier Index (@ 20C) (1)	10	N/A	2022/01/14	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C) (1)	1	N/A	2022/01/17	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	10	N/A	2022/01/14	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	1	N/A	2022/01/17	ATL SOP 00049	Auto Calc.
Reactive Silica (1)	10	N/A	2022/01/10	ATL SOP 00022	EPA 366.0 m
Reactive Silica (1)	1	N/A	2022/01/07	ATL SOP 00022	EPA 366.0 m
Sulphate (1)	8	N/A	2022/01/10	ATL SOP 00023	ASTM D516-16 m
Sulphate (1)	2	N/A	2022/01/11	ATL SOP 00023	ASTM D516-16 m
Sulphate (1)	1	N/A	2022/01/07	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc) (1)	10	N/A	2022/01/14	N/A	Auto Calc.
Total Dissolved Solids (TDS calc) (1)	1	N/A	2022/01/17	N/A	Auto Calc.
Organic carbon - Total (TOC) (1, 3)	11	N/A	2022/01/06	ATL SOP 00203	SM 23 5310B m
Turbidity (1)	11	N/A	2022/01/06	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Bureau Veritas Laboratories 465 George St., Unit G, Sydney, NS, B1P 1K5 Tel:902 567 1255 Toll Free: 888 535 7770 Fax: 902 539 6504 www.bvlabs.com

Site Location: NS LANDS SW PROGRAM
Your C.O.C. #: 856956-01-01, 856956-02-01

Attention: Nadine Wambolt

Dillon Consulting Limited
275 Charlotte St
Sydney, NS
CANADA B1P 1C6

Report Date: 2022/01/19
Report #: R6967796
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1AE942
Received: 2021/12/16, 14:38

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Bedford, 200 Bluewater Rd Suite 105, Bedford, NS, B4B 1G9
(2) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(3) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Natalie MacAskill, Key Account Specialist
Email: Natalie.MacAskill@bureauveritas.com
Phone# (902)567-1255 Ext:17
==========
This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C1AE942
Report Date: 2022/01/19

Dillon Consulting Limited
Site Location: NS LANDS SW PROGRAM
Sampler Initials: MS

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		RMI770		RMI771			RMI772		
Sampling Date		2021/12/16		2021/12/16			2021/12/16		
COC Number		856956-01-01		856956-01-01			856956-01-01		
	UNITS	CB-SW	RDL	NRC-1-SW	RDL	QC Batch	SRC-1-SW	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	2.63	N/A	2.06	N/A	7756157	6.34	N/A	7756157
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	55	1.0	25	1.0	7756151	96	1.0	7756151
Calculated TDS	mg/L	150	1.0	200	1.0	7756166	370	1.0	7756166
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0	7756151	<1.0	1.0	7756151
Cation Sum	me/L	2.52	N/A	4.73	N/A	7756157	6.12	N/A	7756157
Hardness (CaCO3)	mg/L	71	1.0	73	1.0	7756106	150	1.0	7756106
Ion Balance (% Difference)	%	2.14	N/A	39.3	N/A	7756155	1.77	N/A	7756155
Langelier Index (@ 20C)	N/A	-0.502		-1.66		7756162	0.132		7756162
Langelier Index (@ 4C)	N/A	-0.753		-1.91		7756164	-0.116		7756164
Nitrate (N)	mg/L	0.16	0.050	0.25	0.050	7756159	0.56	0.050	7756159
Saturation pH (@ 20C)	N/A	8.25		8.78		7756162	7.74		7756162
Saturation pH (@ 4C)	N/A	8.50		9.03		7756164	7.99		7756164
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	55	5.0	25	5.0	7772271	96 (1)	10	7772271
Dissolved Chloride (Cl-)	mg/L	37	1.0	43	1.0	7772294	110	5.0	7772294
Colour	TCU	38	5.0	8.5	5.0	7772297	29	5.0	7772297
Nitrate + Nitrite (N)	mg/L	0.16	0.050	0.25	0.050	7772300	0.58	0.050	7772300
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	7772302	0.017	0.010	7772302
Nitrogen (Ammonia Nitrogen)	mg/L	0.088	0.050	0.13	0.050	7767152	1.4	0.050	7767153
Total Organic Carbon (C)	mg/L	5.5	0.50	30 (2)	5.0	7767339	6.2	0.50	7767337
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	7772299	<0.010	0.010	7772299
pH	pH	7.75		7.12		7767136	7.87		7767136
Reactive Silica (SiO2)	mg/L	6.3	0.50	5.4	0.50	7772296	8.7	0.50	7772296
Dissolved Sulphate (SO4)	mg/L	22	2.0	15	2.0	7772295	65	2.0	7772295
Turbidity	NTU	5.5	0.10	>1000	1.0	7767193	9.9	0.10	7767193
Conductivity	uS/cm	270	1.0	220	1.0	7767135	670	1.0	7767135

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.
(2) Elevated reporting limit due to turbidity.

Bureau Veritas Laboratories 465 George St., Unit G, Sydney, NS, B1P 1K5 Tel:902 567 1255 Toll Free: 888 535 7770 Fax: 902 539 6504 www.bvlabs.com

Bureau Veritas Job #: C1AE942
Report Date: 2022/01/19

Dillon Consulting Limited
Site Location: NS LANDS SW PROGRAM
Sampler Initials: MS

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		RMI773			RMI774		RMI775	RMI776		
Sampling Date		2021/12/16			2021/12/16		2021/12/16	2021/12/16		
COC Number		856956-01-01			856956-01-01		856956-01-01	856956-01-01		
	UNITS	COB-A-SW	RDL	QC Batch	COB-B-SW	RDL	COB-4-SW	COB-6-SW	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	5.40	N/A	7756157	6.63	N/A	2.95	3.90	N/A	7756157
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	96	1.0	7756151	94	1.0	49	62	1.0	7756151
Calculated TDS	mg/L	340	1.0	7756166	410	1.0	180	230	1.0	7756166
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	7756151	<1.0	1.0	<1.0	<1.0	1.0	7756151
Cation Sum	me/L	5.58	N/A	7756157	6.39	N/A	2.91	3.66	N/A	7756157
Hardness (CaCO3)	mg/L	230	1.0	7756106	260	1.0	80	100	1.0	7756106
Ion Balance (% Difference)	%	1.64	N/A	7756155	1.84	N/A	0.680	3.17	N/A	7756155
Langelier Index (@ 20C)	N/A	0.367		7756162	0.229		-0.525	-0.104		7756162
Langelier Index (@ 4C)	N/A	0.118		7756164	-0.0190		-0.775	-0.354		7756164
Nitrate (N)	mg/L	0.25	0.050	7756159	0.40	0.050	0.21	0.27	0.050	7756159
Saturation pH (@ 20C)	N/A	7.57		7756162	7.54		8.26	8.06		7756162
Saturation pH (@ 4C)	N/A	7.82		7756164	7.79		8.51	8.31		7756164
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	97 (1)	10	7772271	95	5.0	49	63	5.0	7772271
Dissolved Chloride (Cl-)	mg/L	31	1.0	7772294	36	1.0	40	57	1.0	7772294
Colour	TCU	<5.0	5.0	7772297	<5.0	5.0	11	16	5.0	7772297
Nitrate + Nitrite (N)	mg/L	0.25	0.050	7772300	0.40	0.050	0.21	0.29	0.050	7772300
Nitrite (N)	mg/L	<0.010	0.010	7772302	<0.010	0.010	<0.010	0.016	0.010	7772302
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	7767152	0.071	0.050	0.10	0.24	0.050	7767153
Total Organic Carbon (C)	mg/L	2.2	0.50	7767337	2.3	0.50	4.4	3.4	0.50	7767337
Orthophosphate (P)	mg/L	<0.010	0.010	7772299	0.039	0.010	<0.010	<0.010	0.010	7772299
pH	pH	7.94		7767136	7.77		7.73	7.95		7767136
Reactive Silica (SiO2)	mg/L	14	0.50	7772296	13	0.50	7.4	8.2	0.50	7772296
Dissolved Sulphate (SO4)	mg/L	120	10	7772295	180	10	40	49	2.0	7772295
Turbidity	NTU	0.68	0.10	7767193	0.45	0.10	54	6.7	0.10	7767193
Conductivity	uS/cm	550	1.0	7767135	630	1.0	300	400	1.0	7767135

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

Bureau Veritas Laboratories 465 George St., Unit G, Sydney, NS, B1P 1K5 Tel:902 567 1255 Toll Free: 888 535 7770 Fax: 902 539 6504 www.bvlabs.com

Bureau Veritas Job #: C1AE942
Report Date: 2022/01/19

Dillon Consulting Limited
Site Location: NS LANDS SW PROGRAM
Sampler Initials: MS

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		RMI777			RMI778			RMI779		
Sampling Date		2021/12/16			2021/12/16			2021/12/16		
COC Number		856956-01-01			856956-01-01			856956-01-01		
	UNITS	WB-1-SW	RDL	QC Batch	NARROWS	RDL	QC Batch	BP-1-SW	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	1.02	N/A	7756157	32.3	N/A	7756157	52.5	N/A	7756157
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	16	1.0	7756151	76	1.0	7756151	52	1.0	7756151
Calculated TDS	mg/L	62	1.0	7756166	1900	1.0	7756166	3000	1.0	7756166
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	7756151	<1.0	1.0	7756151	<1.0	1.0	7756151
Cation Sum	me/L	0.950	N/A	7756157	34.4	N/A	7756157	49.1	N/A	7756157
Hardness (CaCO3)	mg/L	20	1.0	7756106	440	1.0	7756106	550	1.0	7756106
Ion Balance (% Difference)	%	3.55	N/A	7756155	3.07	N/A	7756155	3.32	N/A	7756155
Langelier Index (@ 20C)	N/A	-2.10		7756162	-0.119		7756162	-0.104		7756162
Langelier Index (@ 4C)	N/A	-2.35		7756164	-0.363		7756164	-0.346		7756164
Nitrate (N)	mg/L	0.081	0.050	7756159	0.17	0.050	7756159	0.17	0.050	7756159
Saturation pH (@ 20C)	N/A	9.34		7756162	7.97		7756162	8.23		7756162
Saturation pH (@ 4C)	N/A	9.59		7756164	8.21		7756164	8.47		7756164
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	16	5.0	7772274	76	5.0	7770072	52	5.0	7772274
Dissolved Chloride (Cl-)	mg/L	20	1.0	7772303	910	10	7771605	1600	50	7772303
Colour	TCU	47	5.0	7772310	28	5.0	7771608	29	5.0	7772310
Nitrate + Nitrite (N)	mg/L	0.081	0.050	7772313	0.17	0.050	7771610	0.17	0.050	7772313
Nitrite (N)	mg/L	<0.010	0.010	7772315	<0.010	0.010	7771611	<0.010	0.010	7772315
Nitrogen (Ammonia Nitrogen)	mg/L	0.082	0.050	7767153	0.11	0.050	7767152	0.082	0.050	7767149
Total Organic Carbon (C)	mg/L	5.2	0.50	7767143	4.0	0.50	7767337	4.3	0.50	7767337
Orthophosphate (P)	mg/L	<0.010	0.010	7772311	<0.010	0.010	7771609	<0.010	0.010	7772311
pH	pH	7.24		7767136	7.85		7767136	8.13		7767136
Reactive Silica (SiO2)	mg/L	5.5	0.50	7772308	7.8	0.50	7771607	5.3	0.50	7772308
Dissolved Sulphate (SO4)	mg/L	6.7	2.0	7772306	250	10	7771606	260	10	7772306
Turbidity	NTU	1.9	0.10	7767193	3.0	0.10	7767193	3.2	0.10	7767193
Conductivity	uS/cm	100	1.0	7767135	3600	1.0	7767135	5200	1.0	7767135

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Bureau Veritas Job #: C1AE942
Report Date: 2022/01/19

Dillon Consulting Limited
Site Location: NS LANDS SW PROGRAM
Sampler Initials: MS

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		RMI780		
Sampling Date		2021/12/16		
COC Number		856956-02-01		
	UNITS	**FD-17**	**RDL**	**QC Batch**
Calculated Parameters				
Anion Sum	me/L	2.68	N/A	7756157
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	56	1.0	7756151
Calculated TDS	mg/L	160	1.0	7756166
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	7756151
Cation Sum	me/L	2.54	N/A	7756157
Hardness (CaCO3)	mg/L	73	1.0	7756106
Ion Balance (% Difference)	%	2.68	N/A	7756155
Langelier Index (@ 20C)	N/A	-0.394		7756162
Langelier Index (@ 4C)	N/A	-0.644		7756164
Nitrate (N)	mg/L	0.16	0.050	7756159
Saturation pH (@ 20C)	N/A	8.23		7756162
Saturation pH (@ 4C)	N/A	8.48		7756164
Inorganics				
Total Alkalinity (Total as CaCO3)	mg/L	56	5.0	7772274
Dissolved Chloride (Cl-)	mg/L	38	1.0	7772303
Colour	TCU	38	5.0	7772310
Nitrate + Nitrite (N)	mg/L	0.16	0.050	7772313
Nitrite (N)	mg/L	<0.010	0.010	7772315
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	7767152
Total Organic Carbon (C)	mg/L	5.3	0.50	7767337
Orthophosphate (P)	mg/L	<0.010	0.010	7772311
pH	pH	7.84		7767136
Reactive Silica (SiO2)	mg/L	6.5	0.50	7772308
Dissolved Sulphate (SO4)	mg/L	22	2.0	7772306
Turbidity	NTU	4.2	0.10	7767193
Conductivity	uS/cm	270	1.0	7767135

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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MERCURY BY COLD VAPOUR AA (SURFACE WATER)

Bureau Veritas ID		RMI770	RMI771	RMI772	RMI773	RMI774	RMI775		
Sampling Date		2021/12/16	2021/12/16	2021/12/16	2021/12/16	2021/12/16	2021/12/16		
COC Number		856956-01-01	856956-01-01	856956-01-01	856956-01-01	856956-01-01	856956-01-01		
	UNITS	CB-SW	NRC-1-SW	SRC-1-SW	COB-A-SW	COB-B-SW	COB-4-SW	RDL	QC Batch
Metals									
Total Mercury (Hg)	ug/L	<0.013	0.18	<0.013	<0.013	<0.013	<0.013	0.013	7779210

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		RMI776	RMI777	RMI778	RMI779	RMI780		
Sampling Date		2021/12/16	2021/12/16	2021/12/16	2021/12/16	2021/12/16		
COC Number		856956-01-01	856956-01-01	856956-01-01	856956-01-01	856956-02-01		
	UNITS	COB-6-SW	WB-1-SW	NARROWS	BP-1-SW	FD-17	RDL	QC Batch
Metals								
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	7779210

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ICP/MS (SURFACE WATER)

Bureau Veritas ID		RMI770		RMI771			RMI772		RMI773		
Sampling Date		2021/12/16		2021/12/16			2021/12/16		2021/12/16		
COC Number		856956-01-01		856956-01-01			856956-01-01		856956-01-01		
	UNITS	CB-SW	RDL	NRC-1-SW	RDL	QC Batch	SRC-1-SW	QC Batch	COB-A-SW	RDL	QC Batch
Metals											
Total Aluminum (Al)	ug/L	110	5.0	41000	50	7757965	220	7757267	7.1	5.0	7765095
Total Antimony (Sb)	ug/L	<1.0	1.0	<10	10	7757965	<1.0	7757267	<1.0	1.0	7757965
Total Arsenic (As)	ug/L	<1.0	1.0	50	10	7757965	1.4	7757267	<1.0	1.0	7757965
Total Barium (Ba)	ug/L	11	1.0	290	10	7757965	18	7757267	13	1.0	7757965
Total Beryllium (Be)	ug/L	<0.10	0.10	2.4	1.0	7757965	<0.10	7757267	<0.10	0.10	7757965
Total Bismuth (Bi)	ug/L	<2.0	2.0	<20	20	7757965	<2.0	7757267	<2.0	2.0	7757965
Total Boron (B)	ug/L	<50	50	<500	500	7757965	200	7757267	57	50	7757965
Total Cadmium (Cd)	ug/L	0.014	0.010	1.4	0.10	7757965	0.033	7757267	<0.010	0.010	7757965
Total Calcium (Ca)	ug/L	24000	100	16000	1000	7757965	53000	7757267	75000	100	7757965
Total Chromium (Cr)	ug/L	<1.0	1.0	40	10	7757965	1.1	7757267	<1.0	1.0	7757965
Total Cobalt (Co)	ug/L	<0.40	0.40	35	4.0	7757965	<0.40	7757267	<0.40	0.40	7757965
Total Copper (Cu)	ug/L	1.3	0.50	54	5.0	7757965	2.6	7757267	<0.50	0.50	7757965
Total Iron (Fe)	ug/L	300	50	55000	500	7757965	680	7757267	53	50	7757965
Total Lead (Pb)	ug/L	<0.50	0.50	98	5.0	7757965	0.83	7757267	<0.50	0.50	7757965
Total Magnesium (Mg)	ug/L	2800	100	7800	1000	7757965	5600	7757267	9500	100	7757965
Total Manganese (Mn)	ug/L	200	2.0	10000	20	7757965	170	7757267	63	2.0	7757965
Total Molybdenum (Mo)	ug/L	<2.0	2.0	<20	20	7757965	<2.0	7757267	<2.0	2.0	7757965
Total Nickel (Ni)	ug/L	<2.0	2.0	52	20	7757965	<2.0	7757267	<2.0	2.0	7757965
Total Phosphorus (P)	ug/L	<100	100	1600	1000	7757965	<100	7757267	<100	100	7757965
Total Potassium (K)	ug/L	1100	100	5100	1000	7757965	3900	7757267	2400	100	7757965
Total Selenium (Se)	ug/L	<0.50	0.50	<5.0	5.0	7757965	<0.50	7757267	<0.50	0.50	7757965
Total Silver (Ag)	ug/L	<0.10	0.10	<1.0	1.0	7757965	<0.10	7757267	<0.10	0.10	7757965
Total Sodium (Na)	ug/L	24000	100	27000	1000	7757965	65000	7757267	22000	100	7757965
Total Strontium (Sr)	ug/L	62	2.0	73	20	7757965	170	7757267	210	2.0	7757965
Total Thallium (Tl)	ug/L	<0.10	0.10	<1.0	1.0	7757965	<0.10	7757267	<0.10	0.10	7757965
Total Tin (Sn)	ug/L	<2.0	2.0	<20	20	7757965	<2.0	7757267	<2.0	2.0	7757965
Total Titanium (Ti)	ug/L	2.8	2.0	810	20	7757965	5.9	7757267	<2.0	2.0	7757965
Total Uranium (U)	ug/L	0.14	0.10	1.7	1.0	7757965	0.48	7757267	0.32	0.10	7757965
Total Vanadium (V)	ug/L	<2.0	2.0	67	20	7757965	<2.0	7757267	<2.0	2.0	7757965
Total Zinc (Zn)	ug/L	<5.0	5.0	360	50	7757965	7.3	7757267	<5.0	5.0	7757965

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ICP/MS (SURFACE WATER)

Bureau Veritas ID		RMI774		RMI775		RMI776		RMI777		
Sampling Date		2021/12/16		2021/12/16		2021/12/16		2021/12/16		
COC Number		856956-01-01		856956-01-01		856956-01-01		856956-01-01		
	UNITS	COB-B-SW	QC Batch	COB-4-SW	QC Batch	COB-6-SW	QC Batch	WB-1-SW	RDL	QC Batch
Metals										
Total Aluminum (Al)	ug/L	6.8	7765095	1900	7757965	160	7757977	180	5.0	7757965
Total Antimony (Sb)	ug/L	<1.0	7757965	<1.0	7757965	<1.0	7757977	<1.0	1.0	7757965
Total Arsenic (As)	ug/L	<1.0	7757965	2.6	7757965	<1.0	7757977	<1.0	1.0	7757965
Total Barium (Ba)	ug/L	17	7757965	29	7757965	20	7757977	10	1.0	7757965
Total Beryllium (Be)	ug/L	<0.10	7757965	0.10	7757965	<0.10	7757977	<0.10	0.10	7757965
Total Bismuth (Bi)	ug/L	<2.0	7757965	<2.0	7757965	<2.0	7757977	<2.0	2.0	7757965
Total Boron (B)	ug/L	78	7757965	<50	7757965	53	7757977	<50	50	7757965
Total Cadmium (Cd)	ug/L	<0.010	7757965	0.080	7757965	0.018	7757977	0.035	0.010	7757965
Total Calcium (Ca)	ug/L	87000	7757965	27000	7757965	35000	7757977	6000	100	7757965
Total Chromium (Cr)	ug/L	<1.0	7757965	2.0	7757965	<1.0	7757977	<1.0	1.0	7757965
Total Cobalt (Co)	ug/L	<0.40	7757965	1.7	7757965	<0.40	7757977	<0.40	0.40	7757965
Total Copper (Cu)	ug/L	0.53	7757965	3.0	7757965	1.3	7757977	0.72	0.50	7757965
Total Iron (Fe)	ug/L	91	7757965	2700	7757965	370	7757977	280	50	7757965
Total Lead (Pb)	ug/L	<0.50	7757965	4.5	7757965	0.55	7757977	<0.50	0.50	7757965
Total Magnesium (Mg)	ug/L	9800	7757965	3000	7757965	3400	7757977	1100	100	7757965
Total Manganese (Mn)	ug/L	400	7757965	530	7757965	130	7757977	83	2.0	7757965
Total Molybdenum (Mo)	ug/L	<2.0	7757965	<2.0	7757965	<2.0	7757977	<2.0	2.0	7757965
Total Nickel (Ni)	ug/L	<2.0	7757965	2.8	7757965	<2.0	7757977	<2.0	2.0	7757965
Total Phosphorus (P)	ug/L	<100	7757965	<100	7757965	<100	7757977	<100	100	7757965
Total Potassium (K)	ug/L	2700	7757965	1400	7757965	1800	7757977	480	100	7757965
Total Selenium (Se)	ug/L	<0.50	7757965	<0.50	7757965	<0.50	7757977	<0.50	0.50	7757965
Total Silver (Ag)	ug/L	<0.10	7757965	<0.10	7757965	<0.10	7757977	<0.10	0.10	7757965
Total Sodium (Na)	ug/L	27000	7757965	27000	7757965	36000	7757977	12000	100	7757965
Total Strontium (Sr)	ug/L	220	7757965	100	7757965	150	7757977	33	2.0	7757965
Total Thallium (Tl)	ug/L	<0.10	7757965	<0.10	7757965	<0.10	7757977	<0.10	0.10	7757965
Total Tin (Sn)	ug/L	<2.0	7757965	<2.0	7757965	<2.0	7757977	<2.0	2.0	7757965
Total Titanium (Ti)	ug/L	<2.0	7757965	35	7757965	3.8	7757977	2.6	2.0	7757965
Total Uranium (U)	ug/L	0.39	7757965	0.29	7757965	0.26	7757977	<0.10	0.10	7757965
Total Vanadium (V)	ug/L	<2.0	7757965	3.2	7757965	<2.0	7757977	<2.0	2.0	7757965
Total Zinc (Zn)	ug/L	<5.0	7757965	21	7757965	5.7	7757977	<5.0	5.0	7757965

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ICP/MS (SURFACE WATER)

Bureau Veritas ID		RMI778		RMI779		RMI780		
Sampling Date		2021/12/16		2021/12/16		2021/12/16		
COC Number		856956-01-01		856956-01-01		856956-02-01		
	UNITS	NARROWS	QC Batch	BP-1-SW	QC Batch	FD-17	RDL	QC Batch
Metals								
Total Aluminum (Al)	ug/L	130	7757977	130	7757965	110	5.0	7757267
Total Antimony (Sb)	ug/L	<1.0	7757977	<1.0	7757965	<1.0	1.0	7757267
Total Arsenic (As)	ug/L	<1.0	7757977	<1.0	7757965	<1.0	1.0	7757267
Total Barium (Ba)	ug/L	16	7757977	16	7757965	11	1.0	7757267
Total Beryllium (Be)	ug/L	<0.10	7757977	<0.10	7757965	<0.10	0.10	7757267
Total Bismuth (Bi)	ug/L	<2.0	7757977	<2.0	7757965	<2.0	2.0	7757267
Total Boron (B)	ug/L	280	7757977	380	7757965	<50	50	7757267
Total Cadmium (Cd)	ug/L	0.052	7757977	0.028	7757965	0.012	0.010	7757267
Total Calcium (Ca)	ug/L	63000	7757977	58000	7757965	25000	100	7757267
Total Chromium (Cr)	ug/L	<1.0	7757977	<1.0	7757965	<1.0	1.0	7757267
Total Cobalt (Co)	ug/L	<0.40	7757977	<0.40	7757965	<0.40	0.40	7757267
Total Copper (Cu)	ug/L	1.1	7757977	0.88	7757965	1.3	0.50	7757267
Total Iron (Fe)	ug/L	290	7757977	290	7757965	330	50	7757267
Total Lead (Pb)	ug/L	<0.50	7757977	<0.50	7757965	<0.50	0.50	7757267
Total Magnesium (Mg)	ug/L	68000	7757977	99000	7757965	2800	100	7757267
Total Manganese (Mn)	ug/L	70	7757977	71	7757965	200	2.0	7757267
Total Molybdenum (Mo)	ug/L	<2.0	7757977	<2.0	7757965	<2.0	2.0	7757267
Total Nickel (Ni)	ug/L	<2.0	7757977	<2.0	7757965	<2.0	2.0	7757267
Total Phosphorus (P)	ug/L	<100	7757977	<100	7757965	<100	100	7757267
Total Potassium (K)	ug/L	22000	7757977	31000	7757965	1100	100	7757267
Total Selenium (Se)	ug/L	<0.50	7757977	<0.50	7757965	<0.50	0.50	7757267
Total Silver (Ag)	ug/L	<0.10	7757977	<0.10	7757965	<0.10	0.10	7757267
Total Sodium (Na)	ug/L	580000	7757977	860000	7757965	24000	100	7757267
Total Strontium (Sr)	ug/L	580	7757977	670	7757965	63	2.0	7757267
Total Thallium (Tl)	ug/L	<0.10	7757977	<0.10	7757965	<0.10	0.10	7757267
Total Tin (Sn)	ug/L	<2.0	7757977	<2.0	7757965	<2.0	2.0	7757267
Total Titanium (Ti)	ug/L	2.5	7757977	<2.0	7757965	2.6	2.0	7757267
Total Uranium (U)	ug/L	0.46	7757977	0.38	7757965	0.14	0.10	7757267
Total Vanadium (V)	ug/L	<2.0	7757977	<2.0	7757965	<2.0	2.0	7757267
Total Zinc (Zn)	ug/L	53	7757977	6.7	7757965	5.1	5.0	7757267

RDL = Reportable Detection Limit
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SEMI-VOLATILE ORGANICS BY GC-MS (SURFACE WATER)

Bureau Veritas ID		RMI775	RMI776		
Sampling Date		2021/12/16	2021/12/16		
COC Number		856956-01-01	856956-01-01		
	UNITS	COB-4-SW	COB-6-SW	RDL	QC Batch
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	ug/L	<0.050	0.062	0.050	7757785
2-Methylnaphthalene	ug/L	<0.050	<0.050	0.050	7757785
Acenaphthene	ug/L	0.022	0.11	0.010	7757785
Acenaphthylene	ug/L	<0.010	0.010	0.010	7757785
Anthracene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(a)anthracene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(a)pyrene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(b/j)fluoranthene	ug/L	<0.020	<0.020	0.020	7756200
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	0.010	7757785
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	0.010	7757785
Chrysene	ug/L	<0.010	<0.010	0.010	7757785
Dibenzo(a,h)anthracene	ug/L	<0.010	<0.010	0.010	7757785
Fluoranthene	ug/L	0.017	0.016	0.010	7757785
Fluorene	ug/L	0.012	0.051	0.010	7757785
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	0.010	7757785
Naphthalene	ug/L	<0.20	<0.20	0.20	7757785
Perylene	ug/L	<0.010	<0.010	0.010	7757785
Phenanthrene	ug/L	0.017	0.021	0.010	7757785
Pyrene	ug/L	0.014	0.012	0.010	7757785
Surrogate Recovery (%)					
D10-Anthracene	%	84	52		7757785
D14-Terphenyl	%	86	93		7757785
D8-Acenaphthylene	%	87	50		7757785

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QC Batch = Quality Control Batch

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GENERAL COMMENTS

Sample RMI771 [NRC-1-SW] : Elevated reporting limits for trace metals due to sample matrix.
Poor RCAp Ion Balance due to sample matrix. Excess cations due to presence of turbidity.

Sample RMI774 [COB-B-SW] : ortho-Phosphate > Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.
Sample RMI773, Metals Water Total MS: Test repeated.
Sample RMI774, Metals Water Total MS: Test repeated.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7757267	MLB	Matrix Spike	Total Aluminum (Al)	2021/12/29		97	%	80 - 120
			Total Antimony (Sb)	2021/12/29		99	%	80 - 120
			Total Arsenic (As)	2021/12/29		95	%	80 - 120
			Total Barium (Ba)	2021/12/29		94	%	80 - 120
			Total Beryllium (Be)	2021/12/29		94	%	80 - 120
			Total Bismuth (Bi)	2021/12/29		96	%	80 - 120
			Total Boron (B)	2021/12/29		92	%	80 - 120
			Total Cadmium (Cd)	2021/12/29		97	%	80 - 120
			Total Calcium (Ca)	2021/12/29		NC	%	80 - 120
			Total Chromium (Cr)	2021/12/29		99	%	80 - 120
			Total Cobalt (Co)	2021/12/29		99	%	80 - 120
			Total Copper (Cu)	2021/12/29		NC	%	80 - 120
			Total Iron (Fe)	2021/12/29		98	%	80 - 120
			Total Lead (Pb)	2021/12/29		98	%	80 - 120
			Total Magnesium (Mg)	2021/12/29		NC	%	80 - 120
			Total Manganese (Mn)	2021/12/29		NC	%	80 - 120
			Total Molybdenum (Mo)	2021/12/29		100	%	80 - 120
			Total Nickel (Ni)	2021/12/29		NC	%	80 - 120
			Total Phosphorus (P)	2021/12/29		100	%	80 - 120
			Total Potassium (K)	2021/12/29		98	%	80 - 120
			Total Selenium (Se)	2021/12/29		97	%	80 - 120
			Total Silver (Ag)	2021/12/29		97	%	80 - 120
			Total Sodium (Na)	2021/12/29		97	%	80 - 120
			Total Strontium (Sr)	2021/12/29		NC	%	80 - 120
			Total Thallium (Tl)	2021/12/29		96	%	80 - 120
			Total Tin (Sn)	2021/12/29		98	%	80 - 120
			Total Titanium (Ti)	2021/12/29		102	%	80 - 120
			Total Uranium (U)	2021/12/29		103	%	80 - 120
			Total Vanadium (V)	2021/12/29		101	%	80 - 120
			Total Zinc (Zn)	2021/12/29		NC	%	80 - 120
7757267	MLB	Spiked Blank	Total Aluminum (Al)	2021/12/29		99	%	80 - 120
			Total Antimony (Sb)	2021/12/29		96	%	80 - 120
			Total Arsenic (As)	2021/12/29		93	%	80 - 120
			Total Barium (Ba)	2021/12/29		94	%	80 - 120
			Total Beryllium (Be)	2021/12/29		92	%	80 - 120
			Total Bismuth (Bi)	2021/12/29		97	%	80 - 120
			Total Boron (B)	2021/12/29		91	%	80 - 120
			Total Cadmium (Cd)	2021/12/29		97	%	80 - 120
			Total Calcium (Ca)	2021/12/29		99	%	80 - 120
			Total Chromium (Cr)	2021/12/29		98	%	80 - 120
			Total Cobalt (Co)	2021/12/29		100	%	80 - 120
			Total Copper (Cu)	2021/12/29		100	%	80 - 120
			Total Iron (Fe)	2021/12/29		98	%	80 - 120
			Total Lead (Pb)	2021/12/29		99	%	80 - 120
			Total Magnesium (Mg)	2021/12/29		100	%	80 - 120
			Total Manganese (Mn)	2021/12/29		98	%	80 - 120
			Total Molybdenum (Mo)	2021/12/29		97	%	80 - 120
			Total Nickel (Ni)	2021/12/29		100	%	80 - 120
			Total Phosphorus (P)	2021/12/29		100	%	80 - 120
			Total Potassium (K)	2021/12/29		98	%	80 - 120
			Total Selenium (Se)	2021/12/29		96	%	80 - 120
			Total Silver (Ag)	2021/12/29		97	%	80 - 120
			Total Sodium (Na)	2021/12/29		98	%	80 - 120
			Total Strontium (Sr)	2021/12/29		95	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Thallium (Tl)	2021/12/29		97	%	80 - 120
			Total Tin (Sn)	2021/12/29		98	%	80 - 120
			Total Titanium (Ti)	2021/12/29		101	%	80 - 120
			Total Uranium (U)	2021/12/29		102	%	80 - 120
			Total Vanadium (V)	2021/12/29		99	%	80 - 120
			Total Zinc (Zn)	2021/12/29		99	%	80 - 120
7757267	MLB	Method Blank	Total Aluminum (Al)	2021/12/29	<5.0		ug/L	
			Total Antimony (Sb)	2021/12/29	<1.0		ug/L	
			Total Arsenic (As)	2021/12/29	<1.0		ug/L	
			Total Barium (Ba)	2021/12/29	<1.0		ug/L	
			Total Beryllium (Be)	2021/12/29	<0.10		ug/L	
			Total Bismuth (Bi)	2021/12/29	<2.0		ug/L	
			Total Boron (B)	2021/12/29	<50		ug/L	
			Total Cadmium (Cd)	2021/12/29	<0.010		ug/L	
			Total Calcium (Ca)	2021/12/29	<100		ug/L	
			Total Chromium (Cr)	2021/12/29	<1.0		ug/L	
			Total Cobalt (Co)	2021/12/29	<0.40		ug/L	
			Total Copper (Cu)	2021/12/29	<0.50		ug/L	
			Total Iron (Fe)	2021/12/29	<50		ug/L	
			Total Lead (Pb)	2021/12/29	<0.50		ug/L	
			Total Magnesium (Mg)	2021/12/29	<100		ug/L	
			Total Manganese (Mn)	2021/12/29	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/12/29	<2.0		ug/L	
			Total Nickel (Ni)	2021/12/29	<2.0		ug/L	
			Total Phosphorus (P)	2021/12/29	<100		ug/L	
			Total Potassium (K)	2021/12/29	<100		ug/L	
			Total Selenium (Se)	2021/12/29	<0.50		ug/L	
			Total Silver (Ag)	2021/12/29	<0.10		ug/L	
			Total Sodium (Na)	2021/12/29	<100		ug/L	
			Total Strontium (Sr)	2021/12/29	<2.0		ug/L	
			Total Thallium (Tl)	2021/12/29	<0.10		ug/L	
			Total Tin (Sn)	2021/12/29	<2.0		ug/L	
			Total Titanium (Ti)	2021/12/29	<2.0		ug/L	
			Total Uranium (U)	2021/12/29	<0.10		ug/L	
			Total Vanadium (V)	2021/12/29	<2.0		ug/L	
			Total Zinc (Zn)	2021/12/29	<5.0		ug/L	
7757267	MLB	RPD	Total Aluminum (Al)	2021/12/30	6.4		%	20
			Total Antimony (Sb)	2021/12/30	NC		%	20
			Total Arsenic (As)	2021/12/30	3.6		%	20
			Total Barium (Ba)	2021/12/30	NC		%	20
			Total Beryllium (Be)	2021/12/30	NC		%	20
			Total Bismuth (Bi)	2021/12/30	NC		%	20
			Total Boron (B)	2021/12/30	NC		%	20
			Total Cadmium (Cd)	2021/12/30	NC		%	20
			Total Calcium (Ca)	2021/12/30	2.1		%	20
			Total Chromium (Cr)	2021/12/30	NC		%	20
			Total Cobalt (Co)	2021/12/30	NC		%	20
			Total Copper (Cu)	2021/12/30	4.6		%	20
			Total Iron (Fe)	2021/12/30	3.7		%	20
			Total Lead (Pb)	2021/12/30	1.7		%	20
			Total Magnesium (Mg)	2021/12/30	NC		%	20
			Total Manganese (Mn)	2021/12/30	2.1		%	20
			Total Molybdenum (Mo)	2021/12/30	NC		%	20
			Total Nickel (Ni)	2021/12/30	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Phosphorus (P)	2021/12/30	NC		%	20
			Total Potassium (K)	2021/12/30	2.6		%	20
			Total Selenium (Se)	2021/12/30	NC		%	20
			Total Silver (Ag)	2021/12/30	NC		%	20
			Total Sodium (Na)	2021/12/30	0.38		%	20
			Total Strontium (Sr)	2021/12/30	NC		%	20
			Total Thallium (Tl)	2021/12/30	NC		%	20
			Total Tin (Sn)	2021/12/30	NC		%	20
			Total Titanium (Ti)	2021/12/30	NC		%	20
			Total Uranium (U)	2021/12/30	NC		%	20
			Total Vanadium (V)	2021/12/30	NC		%	20
			Total Zinc (Zn)	2021/12/30	NC (1)		%	20
7757785	LGE	Matrix Spike	D10-Anthracene	2021/12/31		103	%	50 - 130
			D14-Terphenyl	2021/12/31		102	%	50 - 130
			D8-Acenaphthylene	2021/12/31		98	%	50 - 130
			1-Methylnaphthalene	2021/12/31		99	%	50 - 130
			2-Methylnaphthalene	2021/12/31		92	%	50 - 130
			Acenaphthene	2021/12/31		91	%	50 - 130
			Acenaphthylene	2021/12/31		99	%	50 - 130
			Anthracene	2021/12/31		91	%	50 - 130
			Benzo(a)anthracene	2021/12/31		85	%	50 - 130
			Benzo(a)pyrene	2021/12/31		87	%	50 - 130
			Benzo(b)fluoranthene	2021/12/31		89	%	50 - 130
			Benzo(g,h,i)perylene	2021/12/31		81	%	50 - 130
			Benzo(j)fluoranthene	2021/12/31		95	%	50 - 130
			Benzo(k)fluoranthene	2021/12/31		90	%	50 - 130
			Chrysene	2021/12/31		93	%	50 - 130
			Dibenzo(a,h)anthracene	2021/12/31		82	%	50 - 130
			Fluoranthene	2021/12/31		91	%	50 - 130
			Fluorene	2021/12/31		97	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/12/31		80	%	50 - 130
			Naphthalene	2021/12/31		93	%	50 - 130
			Perylene	2021/12/31		93	%	50 - 130
			Phenanthrene	2021/12/31		97	%	50 - 130
			Pyrene	2021/12/31		95	%	50 - 130
7757785	LGE	Spiked Blank	D10-Anthracene	2021/12/31		104	%	50 - 130
			D14-Terphenyl	2021/12/31		102	%	50 - 130
			D8-Acenaphthylene	2021/12/31		99	%	50 - 130
			1-Methylnaphthalene	2021/12/31		108	%	50 - 130
			2-Methylnaphthalene	2021/12/31		101	%	50 - 130
			Acenaphthene	2021/12/31		99	%	50 - 130
			Acenaphthylene	2021/12/31		102	%	50 - 130
			Anthracene	2021/12/31		94	%	50 - 130
			Benzo(a)anthracene	2021/12/31		86	%	50 - 130
			Benzo(a)pyrene	2021/12/31		95	%	50 - 130
			Benzo(b)fluoranthene	2021/12/31		92	%	50 - 130
			Benzo(g,h,i)perylene	2021/12/31		91	%	50 - 130
			Benzo(j)fluoranthene	2021/12/31		98	%	50 - 130
			Benzo(k)fluoranthene	2021/12/31		93	%	50 - 130
			Chrysene	2021/12/31		97	%	50 - 130
			Dibenzo(a,h)anthracene	2021/12/31		85	%	50 - 130
			Fluoranthene	2021/12/31		93	%	50 - 130
			Fluorene	2021/12/31		101	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/12/31		88	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2021/12/31		100	%	50 - 130
			Perylene	2021/12/31		98	%	50 - 130
			Phenanthrene	2021/12/31		106	%	50 - 130
			Pyrene	2021/12/31		96	%	50 - 130
7757785	LGE	Method Blank	D10-Anthracene	2021/12/31		95	%	50 - 130
			D14-Terphenyl	2021/12/31		97	%	50 - 130
			D8-Acenaphthylene	2021/12/31		94	%	50 - 130
			1-Methylnaphthalene	2021/12/31	<0.050		ug/L	
			2-Methylnaphthalene	2021/12/31	<0.050		ug/L	
			Acenaphthene	2021/12/31	<0.010		ug/L	
			Acenaphthylene	2021/12/31	<0.010		ug/L	
			Anthracene	2021/12/31	<0.010		ug/L	
			Benzo(a)anthracene	2021/12/31	<0.010		ug/L	
			Benzo(a)pyrene	2021/12/31	<0.010		ug/L	
			Benzo(b)fluoranthene	2021/12/31	<0.010		ug/L	
			Benzo(g,h,i)perylene	2021/12/31	<0.010		ug/L	
			Benzo(j)fluoranthene	2021/12/31	<0.010		ug/L	
			Benzo(k)fluoranthene	2021/12/31	<0.010		ug/L	
			Chrysene	2021/12/31	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2021/12/31	<0.010		ug/L	
			Fluoranthene	2021/12/31	<0.010		ug/L	
			Fluorene	2021/12/31	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2021/12/31	<0.010		ug/L	
			Naphthalene	2021/12/31	<0.20		ug/L	
			Perylene	2021/12/31	<0.010		ug/L	
			Phenanthrene	2021/12/31	<0.010		ug/L	
			Pyrene	2021/12/31	<0.010		ug/L	
7757785	LGE	RPD [RMI776-05]	1-Methylnaphthalene	2021/12/31	8.8		%	40
			2-Methylnaphthalene	2021/12/31	NC		%	40
			Acenaphthene	2021/12/31	10		%	40
			Acenaphthylene	2021/12/31	1.0		%	40
			Anthracene	2021/12/31	NC		%	40
			Benzo(a)anthracene	2021/12/31	NC		%	40
			Benzo(a)pyrene	2021/12/31	NC		%	40
			Benzo(b)fluoranthene	2021/12/31	NC		%	40
			Benzo(g,h,i)perylene	2021/12/31	NC		%	40
			Benzo(j)fluoranthene	2021/12/31	NC		%	40
			Benzo(k)fluoranthene	2021/12/31	NC		%	40
			Chrysene	2021/12/31	NC		%	40
			Dibenzo(a,h)anthracene	2021/12/31	NC		%	40
			Fluoranthene	2021/12/31	9.9		%	40
			Fluorene	2021/12/31	11		%	40
			Indeno(1,2,3-cd)pyrene	2021/12/31	NC		%	40
			Naphthalene	2021/12/31	NC		%	40
			Perylene	2021/12/31	NC		%	40
			Phenanthrene	2021/12/31	0		%	40
			Pyrene	2021/12/31	10		%	40
7757965	BAN	Matrix Spike [RMI774-02]	Total Aluminum (Al)	2021/12/30		99	%	80 - 120
			Total Antimony (Sb)	2021/12/30		101	%	80 - 120
			Total Arsenic (As)	2021/12/30		94	%	80 - 120
			Total Barium (Ba)	2021/12/30		92	%	80 - 120
			Total Beryllium (Be)	2021/12/30		97	%	80 - 120
			Total Bismuth (Bi)	2021/12/30		98	%	80 - 120
			Total Boron (B)	2021/12/30		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Cadmium (Cd)	2021/12/30		96	%	80 - 120
			Total Calcium (Ca)	2021/12/30		NC	%	80 - 120
			Total Chromium (Cr)	2021/12/30		98	%	80 - 120
			Total Cobalt (Co)	2021/12/30		98	%	80 - 120
			Total Copper (Cu)	2021/12/30		98	%	80 - 120
			Total Iron (Fe)	2021/12/30		98	%	80 - 120
			Total Lead (Pb)	2021/12/30		98	%	80 - 120
			Total Magnesium (Mg)	2021/12/30		97	%	80 - 120
			Total Manganese (Mn)	2021/12/30		NC	%	80 - 120
			Total Molybdenum (Mo)	2021/12/30		101	%	80 - 120
			Total Nickel (Ni)	2021/12/30		97	%	80 - 120
			Total Phosphorus (P)	2021/12/30		104	%	80 - 120
			Total Potassium (K)	2021/12/30		98	%	80 - 120
			Total Selenium (Se)	2021/12/30		98	%	80 - 120
			Total Silver (Ag)	2021/12/30		97	%	80 - 120
			Total Sodium (Na)	2021/12/30		NC	%	80 - 120
			Total Strontium (Sr)	2021/12/30		NC	%	80 - 120
			Total Thallium (Tl)	2021/12/30		98	%	80 - 120
			Total Tin (Sn)	2021/12/30		99	%	80 - 120
			Total Titanium (Ti)	2021/12/30		101	%	80 - 120
			Total Uranium (U)	2021/12/30		103	%	80 - 120
			Total Vanadium (V)	2021/12/30		101	%	80 - 120
			Total Zinc (Zn)	2021/12/30		96	%	80 - 120
7757965	BAN	Spiked Blank	Total Aluminum (Al)	2021/12/30		105	%	80 - 120
			Total Antimony (Sb)	2021/12/30		97	%	80 - 120
			Total Arsenic (As)	2021/12/30		94	%	80 - 120
			Total Barium (Ba)	2021/12/30		94	%	80 - 120
			Total Beryllium (Be)	2021/12/30		99	%	80 - 120
			Total Bismuth (Bi)	2021/12/30		99	%	80 - 120
			Total Boron (B)	2021/12/30		102	%	80 - 120
			Total Cadmium (Cd)	2021/12/30		98	%	80 - 120
			Total Calcium (Ca)	2021/12/30		99	%	80 - 120
			Total Chromium (Cr)	2021/12/30		101	%	80 - 120
			Total Cobalt (Co)	2021/12/30		101	%	80 - 120
			Total Copper (Cu)	2021/12/30		101	%	80 - 120
			Total Iron (Fe)	2021/12/30		101	%	80 - 120
			Total Lead (Pb)	2021/12/30		99	%	80 - 120
			Total Magnesium (Mg)	2021/12/30		103	%	80 - 120
			Total Manganese (Mn)	2021/12/30		100	%	80 - 120
			Total Molybdenum (Mo)	2021/12/30		101	%	80 - 120
			Total Nickel (Ni)	2021/12/30		102	%	80 - 120
			Total Phosphorus (P)	2021/12/30		104	%	80 - 120
			Total Potassium (K)	2021/12/30		99	%	80 - 120
			Total Selenium (Se)	2021/12/30		101	%	80 - 120
			Total Silver (Ag)	2021/12/30		99	%	80 - 120
			Total Sodium (Na)	2021/12/30		103	%	80 - 120
			Total Strontium (Sr)	2021/12/30		97	%	80 - 120
			Total Thallium (Tl)	2021/12/30		99	%	80 - 120
			Total Tin (Sn)	2021/12/30		101	%	80 - 120
			Total Titanium (Ti)	2021/12/30		102	%	80 - 120
			Total Uranium (U)	2021/12/30		102	%	80 - 120
			Total Vanadium (V)	2021/12/30		103	%	80 - 120
			Total Zinc (Zn)	2021/12/30		99	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7757965	BAN	Method Blank	Total Aluminum (Al)	2021/12/30	9.7, RDL=5.0 (2)		ug/L	
			Total Antimony (Sb)	2021/12/30	<1.0		ug/L	
			Total Arsenic (As)	2021/12/30	<1.0		ug/L	
			Total Barium (Ba)	2021/12/30	<1.0		ug/L	
			Total Beryllium (Be)	2021/12/30	<0.10		ug/L	
			Total Bismuth (Bi)	2021/12/30	<2.0		ug/L	
			Total Boron (B)	2021/12/30	<50		ug/L	
			Total Cadmium (Cd)	2021/12/30	<0.010		ug/L	
			Total Calcium (Ca)	2021/12/30	<100		ug/L	
			Total Chromium (Cr)	2021/12/30	<1.0		ug/L	
			Total Cobalt (Co)	2021/12/30	<0.40		ug/L	
			Total Copper (Cu)	2021/12/30	<0.50		ug/L	
			Total Iron (Fe)	2021/12/30	<50		ug/L	
			Total Lead (Pb)	2021/12/30	<0.50		ug/L	
			Total Magnesium (Mg)	2021/12/30	<100		ug/L	
			Total Manganese (Mn)	2021/12/30	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/12/30	<2.0		ug/L	
			Total Nickel (Ni)	2021/12/30	<2.0		ug/L	
			Total Phosphorus (P)	2021/12/30	<100		ug/L	
			Total Potassium (K)	2021/12/30	<100		ug/L	
			Total Selenium (Se)	2021/12/30	<0.50		ug/L	
			Total Silver (Ag)	2021/12/30	<0.10		ug/L	
			Total Sodium (Na)	2021/12/30	<100		ug/L	
			Total Strontium (Sr)	2021/12/30	<2.0		ug/L	
			Total Thallium (Tl)	2021/12/30	<0.10		ug/L	
			Total Tin (Sn)	2021/12/30	<2.0		ug/L	
			Total Titanium (Ti)	2021/12/30	<2.0		ug/L	
			Total Uranium (U)	2021/12/30	<0.10		ug/L	
			Total Vanadium (V)	2021/12/30	<2.0		ug/L	
			Total Zinc (Zn)	2021/12/30	<5.0		ug/L	
7757965	BAN	RPD [RMI773-02]	Total Antimony (Sb)	2021/12/30	NC		%	20
			Total Arsenic (As)	2021/12/30	NC		%	20
			Total Barium (Ba)	2021/12/30	1.1		%	20
			Total Beryllium (Be)	2021/12/30	NC		%	20
			Total Bismuth (Bi)	2021/12/30	NC		%	20
			Total Boron (B)	2021/12/30	5.8		%	20
			Total Cadmium (Cd)	2021/12/30	NC		%	20
			Total Calcium (Ca)	2021/12/30	2.3		%	20
			Total Chromium (Cr)	2021/12/30	NC		%	20
			Total Cobalt (Co)	2021/12/30	NC		%	20
			Total Copper (Cu)	2021/12/30	NC		%	20
			Total Iron (Fe)	2021/12/30	1.7		%	20
			Total Lead (Pb)	2021/12/30	NC		%	20
			Total Magnesium (Mg)	2021/12/30	2.9		%	20
			Total Manganese (Mn)	2021/12/30	2.8		%	20
			Total Molybdenum (Mo)	2021/12/30	NC		%	20
			Total Nickel (Ni)	2021/12/30	NC		%	20
			Total Phosphorus (P)	2021/12/30	NC		%	20
			Total Potassium (K)	2021/12/30	0.75		%	20
			Total Selenium (Se)	2021/12/30	NC		%	20
			Total Silver (Ag)	2021/12/30	NC		%	20
			Total Sodium (Na)	2021/12/30	2.8		%	20
			Total Strontium (Sr)	2021/12/30	3.5		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Thallium (Tl)	2021/12/30	NC		%	20
			Total Tin (Sn)	2021/12/30	NC		%	20
			Total Titanium (Ti)	2021/12/30	NC		%	20
			Total Uranium (U)	2021/12/30	0.035		%	20
			Total Vanadium (V)	2021/12/30	NC		%	20
			Total Zinc (Zn)	2021/12/30	NC		%	20
7757977	BAN	Matrix Spike	Total Aluminum (Al)	2021/12/30		108	%	80 - 120
			Total Antimony (Sb)	2021/12/30		103	%	80 - 120
			Total Arsenic (As)	2021/12/30		99	%	80 - 120
			Total Barium (Ba)	2021/12/30		99	%	80 - 120
			Total Beryllium (Be)	2021/12/30		101	%	80 - 120
			Total Bismuth (Bi)	2021/12/30		102	%	80 - 120
			Total Boron (B)	2021/12/30		103	%	80 - 120
			Total Cadmium (Cd)	2021/12/30		99	%	80 - 120
			Total Calcium (Ca)	2021/12/30		102	%	80 - 120
			Total Chromium (Cr)	2021/12/30		103	%	80 - 120
			Total Cobalt (Co)	2021/12/30		104	%	80 - 120
			Total Copper (Cu)	2021/12/30		103	%	80 - 120
			Total Iron (Fe)	2021/12/30		104	%	80 - 120
			Total Lead (Pb)	2021/12/30		103	%	80 - 120
			Total Magnesium (Mg)	2021/12/30		109	%	80 - 120
			Total Manganese (Mn)	2021/12/30		107	%	80 - 120
			Total Molybdenum (Mo)	2021/12/30		106	%	80 - 120
			Total Nickel (Ni)	2021/12/30		104	%	80 - 120
			Total Phosphorus (P)	2021/12/30		109	%	80 - 120
			Total Potassium (K)	2021/12/30		105	%	80 - 120
			Total Selenium (Se)	2021/12/30		102	%	80 - 120
			Total Silver (Ag)	2021/12/30		101	%	80 - 120
			Total Sodium (Na)	2021/12/30		105	%	80 - 120
			Total Strontium (Sr)	2021/12/30		101	%	80 - 120
			Total Thallium (Tl)	2021/12/30		103	%	80 - 120
			Total Tin (Sn)	2021/12/30		104	%	80 - 120
			Total Titanium (Ti)	2021/12/30		98	%	80 - 120
			Total Uranium (U)	2021/12/30		107	%	80 - 120
			Total Vanadium (V)	2021/12/30		106	%	80 - 120
			Total Zinc (Zn)	2021/12/30		101	%	80 - 120
7757977	BAN	Spiked Blank	Total Aluminum (Al)	2021/12/30		98	%	80 - 120
			Total Antimony (Sb)	2021/12/30		96	%	80 - 120
			Total Arsenic (As)	2021/12/30		91	%	80 - 120
			Total Barium (Ba)	2021/12/30		93	%	80 - 120
			Total Beryllium (Be)	2021/12/30		94	%	80 - 120
			Total Bismuth (Bi)	2021/12/30		97	%	80 - 120
			Total Boron (B)	2021/12/30		95	%	80 - 120
			Total Cadmium (Cd)	2021/12/30		93	%	80 - 120
			Total Calcium (Ca)	2021/12/30		97	%	80 - 120
			Total Chromium (Cr)	2021/12/30		94	%	80 - 120
			Total Cobalt (Co)	2021/12/30		95	%	80 - 120
			Total Copper (Cu)	2021/12/30		95	%	80 - 120
			Total Iron (Fe)	2021/12/30		96	%	80 - 120
			Total Lead (Pb)	2021/12/30		98	%	80 - 120
			Total Magnesium (Mg)	2021/12/30		101	%	80 - 120
			Total Manganese (Mn)	2021/12/30		97	%	80 - 120
			Total Molybdenum (Mo)	2021/12/30		98	%	80 - 120
			Total Nickel (Ni)	2021/12/30		96	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Phosphorus (P)	2021/12/30		100	%	80 - 120
			Total Potassium (K)	2021/12/30		96	%	80 - 120
			Total Selenium (Se)	2021/12/30		95	%	80 - 120
			Total Silver (Ag)	2021/12/30		96	%	80 - 120
			Total Sodium (Na)	2021/12/30		97	%	80 - 120
			Total Strontium (Sr)	2021/12/30		95	%	80 - 120
			Total Thallium (Tl)	2021/12/30		98	%	80 - 120
			Total Tin (Sn)	2021/12/30		98	%	80 - 120
			Total Titanium (Ti)	2021/12/30		98	%	80 - 120
			Total Uranium (U)	2021/12/30		101	%	80 - 120
			Total Vanadium (V)	2021/12/30		98	%	80 - 120
			Total Zinc (Zn)	2021/12/30		94	%	80 - 120
7757977	BAN	Method Blank	Total Aluminum (Al)	2021/12/30	<5.0		ug/L	
			Total Antimony (Sb)	2021/12/30	<1.0		ug/L	
			Total Arsenic (As)	2021/12/30	<1.0		ug/L	
			Total Barium (Ba)	2021/12/30	<1.0		ug/L	
			Total Beryllium (Be)	2021/12/30	<0.10		ug/L	
			Total Bismuth (Bi)	2021/12/30	<2.0		ug/L	
			Total Boron (B)	2021/12/30	<50		ug/L	
			Total Cadmium (Cd)	2021/12/30	<0.010		ug/L	
			Total Calcium (Ca)	2021/12/30	<100		ug/L	
			Total Chromium (Cr)	2021/12/30	<1.0		ug/L	
			Total Cobalt (Co)	2021/12/30	<0.40		ug/L	
			Total Copper (Cu)	2021/12/30	<0.50		ug/L	
			Total Iron (Fe)	2021/12/30	<50		ug/L	
			Total Lead (Pb)	2021/12/30	<0.50		ug/L	
			Total Magnesium (Mg)	2021/12/30	<100		ug/L	
			Total Manganese (Mn)	2021/12/30	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/12/30	<2.0		ug/L	
			Total Nickel (Ni)	2021/12/30	<2.0		ug/L	
			Total Phosphorus (P)	2021/12/30	<100		ug/L	
			Total Potassium (K)	2021/12/30	<100		ug/L	
			Total Selenium (Se)	2021/12/30	<0.50		ug/L	
			Total Silver (Ag)	2021/12/30	<0.10		ug/L	
			Total Sodium (Na)	2021/12/30	<100		ug/L	
			Total Strontium (Sr)	2021/12/30	<2.0		ug/L	
			Total Thallium (Tl)	2021/12/30	<0.10		ug/L	
			Total Tin (Sn)	2021/12/30	<2.0		ug/L	
			Total Titanium (Ti)	2021/12/30	<2.0		ug/L	
			Total Uranium (U)	2021/12/30	<0.10		ug/L	
			Total Vanadium (V)	2021/12/30	<2.0		ug/L	
			Total Zinc (Zn)	2021/12/30	<5.0		ug/L	
7757977	BAN	RPD	Total Aluminum (Al)	2021/12/30	12		%	20
			Total Antimony (Sb)	2021/12/30	NC		%	20
			Total Arsenic (As)	2021/12/30	NC		%	20
			Total Barium (Ba)	2021/12/30	1.5		%	20
			Total Beryllium (Be)	2021/12/30	NC		%	20
			Total Bismuth (Bi)	2021/12/30	NC		%	20
			Total Boron (B)	2021/12/30	NC		%	20
			Total Cadmium (Cd)	2021/12/30	4.0		%	20
			Total Calcium (Ca)	2021/12/30	0.84		%	20
			Total Chromium (Cr)	2021/12/30	NC		%	20
			Total Cobalt (Co)	2021/12/30	NC		%	20
			Total Copper (Cu)	2021/12/30	2.9		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Iron (Fe)	2021/12/30	NC		%	20
			Total Lead (Pb)	2021/12/30	NC		%	20
			Total Magnesium (Mg)	2021/12/30	1.0		%	20
			Total Manganese (Mn)	2021/12/30	NC		%	20
			Total Molybdenum (Mo)	2021/12/30	NC		%	20
			Total Nickel (Ni)	2021/12/30	NC		%	20
			Total Phosphorus (P)	2021/12/30	NC		%	20
			Total Potassium (K)	2021/12/30	1.5		%	20
			Total Selenium (Se)	2021/12/30	NC		%	20
			Total Silver (Ag)	2021/12/30	NC		%	20
			Total Sodium (Na)	2021/12/30	2.4		%	20
			Total Strontium (Sr)	2021/12/30	1.4		%	20
			Total Thallium (Tl)	2021/12/30	NC		%	20
			Total Tin (Sn)	2021/12/30	NC		%	20
			Total Titanium (Ti)	2021/12/30	NC		%	20
			Total Uranium (U)	2021/12/30	1.4		%	20
			Total Vanadium (V)	2021/12/30	NC		%	20
			Total Zinc (Zn)	2021/12/30	2.6		%	20
7765095	BAN	Matrix Spike	Total Aluminum (Al)	2022/01/05		101	%	80 - 120
7765095	BAN	Spiked Blank	Total Aluminum (Al)	2022/01/05		101	%	80 - 120
7765095	BAN	Method Blank	Total Aluminum (Al)	2022/01/05	<5.0		ug/L	
7767135	SHW	Spiked Blank	Conductivity	2022/01/06		101	%	80 - 120
7767135	SHW	Method Blank	Conductivity	2022/01/06	1.1, RDL=1.0		uS/cm	
7767135	SHW	RPD [RMI770-01]	Conductivity	2022/01/06	1.9		%	10
7767136	SHW	Spiked Blank	pH	2022/01/06		100	%	97 - 103
7767136	SHW	RPD [RMI770-01]	pH	2022/01/06	0.78		%	N/A
7767143	NGI	Matrix Spike	Total Organic Carbon (C)	2022/01/06		96	%	85 - 115
7767143	NGI	Spiked Blank	Total Organic Carbon (C)	2022/01/06		101	%	80 - 120
7767143	NGI	Method Blank	Total Organic Carbon (C)	2022/01/06	<0.50		mg/L	
7767143	NGI	RPD	Total Organic Carbon (C)	2022/01/06	0.89		%	15
7767149	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2022/01/06		NC	%	80 - 120
7767149	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06		112	%	80 - 120
7767149	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06	<0.050		mg/L	
7767149	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2022/01/06	0.58		%	20
7767152	MCN	Matrix Spike [RMI778-03]	Nitrogen (Ammonia Nitrogen)	2022/01/06		106	%	80 - 120
7767152	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06		110	%	80 - 120
7767152	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06	<0.050		mg/L	
7767152	MCN	RPD [RMI778-03]	Nitrogen (Ammonia Nitrogen)	2022/01/06	9.3		%	20
7767153	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2022/01/06		89	%	80 - 120
7767153	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06		111	%	80 - 120
7767153	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2022/01/06	<0.050		mg/L	
7767153	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2022/01/06	NC		%	20
7767193	SHW	QC Standard	Turbidity	2022/01/06		103	%	80 - 120
7767193	SHW	Spiked Blank	Turbidity	2022/01/06		104	%	80 - 120
7767193	SHW	Method Blank	Turbidity	2022/01/06	<0.10		NTU	
7767193	SHW	RPD	Turbidity	2022/01/06	NC		%	20
7767337	NGI	Matrix Spike	Total Organic Carbon (C)	2022/01/06		97	%	85 - 115
7767337	NGI	Spiked Blank	Total Organic Carbon (C)	2022/01/06		98	%	80 - 120
7767337	NGI	Method Blank	Total Organic Carbon (C)	2022/01/06	<0.50		mg/L	
7767337	NGI	RPD	Total Organic Carbon (C)	2022/01/06	1.9		%	15
7767339	NGI	Matrix Spike	Total Organic Carbon (C)	2022/01/06		98	%	85 - 115
7767339	NGI	Spiked Blank	Total Organic Carbon (C)	2022/01/06		101	%	80 - 120
7767339	NGI	Method Blank	Total Organic Carbon (C)	2022/01/06	<0.50		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7767339	NGI	RPD	Total Organic Carbon (C)	2022/01/06	2.3		%	15
7770072	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2022/01/08		98	%	80 - 120
7770072	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2022/01/08		103	%	80 - 120
7770072	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2022/01/08	<5.0		mg/L	
7770072	MCN	RPD	Total Alkalinity (Total as CaCO3)	2022/01/08	NC		%	20
7771605	MCN	Matrix Spike	Dissolved Chloride (Cl-)	2022/01/07		90	%	80 - 120
7771605	MCN	Spiked Blank	Dissolved Chloride (Cl-)	2022/01/07		88	%	80 - 120
7771605	MCN	Method Blank	Dissolved Chloride (Cl-)	2022/01/07	<1.0		mg/L	
7771605	MCN	RPD	Dissolved Chloride (Cl-)	2022/01/07	NC		%	20
7771606	MCN	Matrix Spike	Dissolved Sulphate (SO4)	2022/01/07		107	%	80 - 120
7771606	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2022/01/07		103	%	80 - 120
7771606	MCN	Method Blank	Dissolved Sulphate (SO4)	2022/01/07	<2.0		mg/L	
7771606	MCN	RPD	Dissolved Sulphate (SO4)	2022/01/07	NC		%	20
7771607	MCN	Matrix Spike	Reactive Silica (SiO2)	2022/01/07		88	%	80 - 120
7771607	MCN	Spiked Blank	Reactive Silica (SiO2)	2022/01/07		90	%	80 - 120
7771607	MCN	Method Blank	Reactive Silica (SiO2)	2022/01/07	<0.50		mg/L	
7771607	MCN	RPD	Reactive Silica (SiO2)	2022/01/07	NC		%	20
7771608	MCN	Spiked Blank	Colour	2022/01/07		98	%	80 - 120
7771608	MCN	Method Blank	Colour	2022/01/07	<5.0		TCU	
7771608	MCN	RPD	Colour	2022/01/07	NC		%	20
7771609	MCN	Matrix Spike	Orthophosphate (P)	2022/01/08		99	%	80 - 120
7771609	MCN	Spiked Blank	Orthophosphate (P)	2022/01/08		99	%	80 - 120
7771609	MCN	Method Blank	Orthophosphate (P)	2022/01/08	<0.010		mg/L	
7771609	MCN	RPD	Orthophosphate (P)	2022/01/08	NC		%	20
7771610	MCN	Matrix Spike	Nitrate + Nitrite (N)	2022/01/07		94	%	80 - 120
7771610	MCN	Spiked Blank	Nitrate + Nitrite (N)	2022/01/07		94	%	80 - 120
7771610	MCN	Method Blank	Nitrate + Nitrite (N)	2022/01/07	<0.050		mg/L	
7771610	MCN	RPD	Nitrate + Nitrite (N)	2022/01/07	NC		%	20
7771611	MCN	Matrix Spike	Nitrite (N)	2022/01/07		97	%	80 - 120
7771611	MCN	Spiked Blank	Nitrite (N)	2022/01/07		99	%	80 - 120
7771611	MCN	Method Blank	Nitrite (N)	2022/01/07	<0.010		mg/L	
7771611	MCN	RPD	Nitrite (N)	2022/01/07	NC		%	20
7772271	EMT	Matrix Spike	Total Alkalinity (Total as CaCO3)	2022/01/10		NC	%	80 - 120
7772271	EMT	Spiked Blank	Total Alkalinity (Total as CaCO3)	2022/01/11		105	%	80 - 120
7772271	EMT	Method Blank	Total Alkalinity (Total as CaCO3)	2022/01/10	<5.0		mg/L	
7772271	EMT	RPD	Total Alkalinity (Total as CaCO3)	2022/01/10	2.0		%	20
7772274	EMT	Matrix Spike	Total Alkalinity (Total as CaCO3)	2022/01/11		NC	%	80 - 120
7772274	EMT	Spiked Blank	Total Alkalinity (Total as CaCO3)	2022/01/11		103	%	80 - 120
7772274	EMT	Method Blank	Total Alkalinity (Total as CaCO3)	2022/01/10	<5.0		mg/L	
7772274	EMT	RPD	Total Alkalinity (Total as CaCO3)	2022/01/11	0.69		%	20
7772294	EMT	Matrix Spike	Dissolved Chloride (Cl-)	2022/01/11		NC	%	80 - 120
7772294	EMT	Spiked Blank	Dissolved Chloride (Cl-)	2022/01/11		96	%	80 - 120
7772294	EMT	Method Blank	Dissolved Chloride (Cl-)	2022/01/11	<1.0		mg/L	
7772294	EMT	RPD	Dissolved Chloride (Cl-)	2022/01/11	11		%	20
7772295	EMT	Matrix Spike	Dissolved Sulphate (SO4)	2022/01/11		NC	%	80 - 120
7772295	EMT	Spiked Blank	Dissolved Sulphate (SO4)	2022/01/11		102	%	80 - 120
7772295	EMT	Method Blank	Dissolved Sulphate (SO4)	2022/01/10	<2.0		mg/L	
7772295	EMT	RPD	Dissolved Sulphate (SO4)	2022/01/11	2.0		%	20
7772296	EMT	Matrix Spike	Reactive Silica (SiO2)	2022/01/10		92	%	80 - 120
7772296	EMT	Spiked Blank	Reactive Silica (SiO2)	2022/01/11		95	%	80 - 120
7772296	EMT	Method Blank	Reactive Silica (SiO2)	2022/01/10	<0.50		mg/L	
7772296	EMT	RPD	Reactive Silica (SiO2)	2022/01/10	NC		%	20
7772297	EMT	Spiked Blank	Colour	2022/01/10		99	%	80 - 120
7772297	EMT	Method Blank	Colour	2022/01/10	<5.0		TCU	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7772297	EMT	RPD	Colour	2022/01/10	NC		%	20
7772299	EMT	Matrix Spike	Orthophosphate (P)	2022/01/10		93	%	80 - 120
7772299	EMT	Spiked Blank	Orthophosphate (P)	2022/01/10		100	%	80 - 120
7772299	EMT	Method Blank	Orthophosphate (P)	2022/01/10	<0.010		mg/L	
7772299	EMT	RPD	Orthophosphate (P)	2022/01/10	NC		%	20
7772300	EMT	Matrix Spike	Nitrate + Nitrite (N)	2022/01/10		88	%	80 - 120
7772300	EMT	Spiked Blank	Nitrate + Nitrite (N)	2022/01/10		97	%	80 - 120
7772300	EMT	Method Blank	Nitrate + Nitrite (N)	2022/01/10	<0.050		mg/L	
7772300	EMT	RPD	Nitrate + Nitrite (N)	2022/01/10	2.0		%	20
7772302	EMT	Matrix Spike	Nitrite (N)	2022/01/10		91	%	80 - 120
7772302	EMT	Spiked Blank	Nitrite (N)	2022/01/10		100	%	80 - 120
7772302	EMT	Method Blank	Nitrite (N)	2022/01/10	<0.010		mg/L	
7772302	EMT	RPD	Nitrite (N)	2022/01/10	3.2		%	20
7772303	EMT	Matrix Spike	Dissolved Chloride (Cl-)	2022/01/10		96	%	80 - 120
7772303	EMT	Spiked Blank	Dissolved Chloride (Cl-)	2022/01/11		94	%	80 - 120
7772303	EMT	Method Blank	Dissolved Chloride (Cl-)	2022/01/11	<1.0		mg/L	
7772303	EMT	RPD	Dissolved Chloride (Cl-)	2022/01/10	0.046		%	20
7772306	EMT	Matrix Spike	Dissolved Sulphate (SO4)	2022/01/10		99	%	80 - 120
7772306	EMT	Spiked Blank	Dissolved Sulphate (SO4)	2022/01/11		98	%	80 - 120
7772306	EMT	Method Blank	Dissolved Sulphate (SO4)	2022/01/10	<2.0		mg/L	
7772306	EMT	RPD	Dissolved Sulphate (SO4)	2022/01/10	1.9		%	20
7772308	EMT	Matrix Spike	Reactive Silica (SiO2)	2022/01/10		NC	%	80 - 120
7772308	EMT	Spiked Blank	Reactive Silica (SiO2)	2022/01/11		99	%	80 - 120
7772308	EMT	Method Blank	Reactive Silica (SiO2)	2022/01/10	<0.50		mg/L	
7772308	EMT	RPD	Reactive Silica (SiO2)	2022/01/10	0.75		%	20
7772310	EMT	Spiked Blank	Colour	2022/01/10		98	%	80 - 120
7772310	EMT	Method Blank	Colour	2022/01/10	<5.0		TCU	
7772310	EMT	RPD	Colour	2022/01/10	NC		%	20
7772311	EMT	Matrix Spike	Orthophosphate (P)	2022/01/10		90	%	80 - 120
7772311	EMT	Spiked Blank	Orthophosphate (P)	2022/01/10		94	%	80 - 120
7772311	EMT	Method Blank	Orthophosphate (P)	2022/01/10	<0.010		mg/L	
7772311	EMT	RPD	Orthophosphate (P)	2022/01/10	NC		%	20
7772313	EMT	Matrix Spike	Nitrate + Nitrite (N)	2022/01/10		84	%	80 - 120
7772313	EMT	Spiked Blank	Nitrate + Nitrite (N)	2022/01/10		98	%	80 - 120
7772313	EMT	Method Blank	Nitrate + Nitrite (N)	2022/01/10	<0.050		mg/L	
7772313	EMT	RPD	Nitrate + Nitrite (N)	2022/01/10	NC		%	20
7772315	EMT	Matrix Spike	Nitrite (N)	2022/01/10		99	%	80 - 120
7772315	EMT	Spiked Blank	Nitrite (N)	2022/01/10		96	%	80 - 120
7772315	EMT	Method Blank	Nitrite (N)	2022/01/10	<0.010		mg/L	
7772315	EMT	RPD	Nitrite (N)	2022/01/10	NC		%	20
7779210	FJO	Matrix Spike [RMI771-05]	Total Mercury (Hg)	2022/01/14		88	%	80 - 120
7779210	FJO	Spiked Blank	Total Mercury (Hg)	2022/01/14		102	%	80 - 120
7779210	FJO	Method Blank	Total Mercury (Hg)	2022/01/14	<0.013		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7779210	FJO	RPD [RMI770-05]	Total Mercury (Hg)	2022/01/14	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Elevated reporting limit due to sample matrix.

(2) Low level lab contamination.

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Bureau Veritas Job #: C1AE942
Report Date: 2022/01/19

Dillon Consulting Limited
Site Location: NS LANDS SW PROGRAM
Sampler Initials: MS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Colleen Acker, B.Sc, Scientific Service Specialist

Rosemarie MacDonald, Scientific Specialist (Organics)

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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Appendix D

Mann-Kendall Tables

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	
	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000005	0.000011	0.000005	0.000017	0.000005	0.000015	0.000014	0.000026	0.000011	0.000014	
	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	16-Dec-21	
Row 1: Compare to Event 1:		1	0	1	0	1	1	1	1	1	7
Row 2: Compare to Event 2:			-1	1	-1	1	1	1	0	1	3
Row 3: Compare to Event 3:				1	0	1	1	1	1	1	6
Row 4: Compare to Event 4:					-1	-1	-1	1	-1	-1	-4
Row 5: Compare to Event 5:						1	1	1	1	1	5
Row 6: Compare to Event 6:							-1	1	-1	-1	-2
Row 7: Compare to Event 7:								1	-1	0	0
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **14**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							X
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.13	0.32	0.14	0.16	0.11	0.34	0.13	0.077	0.078	0.062	
	22-Dec-14	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	16-Dec-21	
Row 1: Compare to Event 1:		1	1	1	-1	1	0	-1	-1	-1	0
Row 2: Compare to Event 2:			-1	-1	-1	1	-1	-1	-1	-1	-6
Row 3: Compare to Event 3:				1	-1	1	-1	-1	-1	-1	-3
Row 4: Compare to Event 4:					-1	1	-1	-1	-1	-1	-4
Row 5: Compare to Event 5:						1	1	-1	-1	-1	-1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-22**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							X
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	16	24	10	23	12	24	32	35	28	22	
	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	16-Dec-21	
Row 1: Compare to Event 1:		1	-1	1	-1	1	1	1	1	1	5
Row 2: Compare to Event 2:			-1	-1	-1	0	1	1	1	-1	-1
Row 3: Compare to Event 3:				1	1	1	1	1	1	1	7
Row 4: Compare to Event 4:					-1	1	1	1	1	-1	2
Row 5: Compare to Event 5:						1	1	1	1	1	5
Row 6: Compare to Event 6:							1	1	1	-1	2
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **16**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							X
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
X	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: CB-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.009	0.0061	0.0025	0.0025	0.0025	0.0025	0.0055	0.012	0.0065	0.0025	
	27-Jul-15	18-Nov-15	22-Jul-16	8-Dec-16	3-Aug-17	18-Dec-17	23-Nov-18	13-Dec-19	1-Dec-20	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	1	-1	-1	-7
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	1	1	-1	-4
Row 3: Compare to Event 3:				0	0	0	1	1	1	0	3
Row 4: Compare to Event 4:					0	0	1	1	1	0	3
Row 5: Compare to Event 5:						0	1	1	1	0	3
Row 6: Compare to Event 6:							1	1	1	0	3
Row 7: Compare to Event 7:								1	1	-1	1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-1**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	NRC-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.25	
	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	1	1
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	1	1
Row 3: Compare to Event 3:				0	0	0	0	0	0	1	1
Row 4: Compare to Event 4:					0	0	0	0	0	1	1
Row 5: Compare to Event 5:						0	0	0	0	1	1
Row 6: Compare to Event 6:							0	0	0	1	1
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **9**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							X
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000025	0.000016	0.000012	0.000015	0.000018	0.00002	0.000011	0.000011	0.000005	0.0014	
	8-Dec-16	18-Dec-17	07-25-18	11-23-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	1	-7
Row 2: Compare to Event 2:			-1	-1	1	1	-1	-1	-1	1	-2
Row 3: Compare to Event 3:				1	1	1	-1	-1	-1	1	1
Row 4: Compare to Event 4:					1	1	-1	-1	-1	1	0
Row 5: Compare to Event 5:						1	-1	-1	-1	1	-1
Row 6: Compare to Event 6:							-1	-1	-1	1	-2
Row 7: Compare to Event 7:								0	-1	1	0
Row 8: Compare to Event 8:									-1	1	0
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-10**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							X
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.034	0.031	0.06	0.035	0.055	0.034	0.06	0.047	0.11	0.073	
	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	1	1	1	0	1	1	1	1	6
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	-1	-1	0	-1	1	1	-2
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	1	-1	1	1	1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	1	1	1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **23**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							X
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
X	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	NRC-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	16	21	12	17	15	18	11	27	18	15	
	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		1	-1	1	-1	1	-1	1	1	-1	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	1	-1	-1	-6
Row 3: Compare to Event 3:				1	1	1	-1	1	1	1	5
Row 4: Compare to Event 4:					-1	1	-1	1	1	-1	0
Row 5: Compare to Event 5:						1	-1	1	1	0	2
Row 6: Compare to Event 6:							-1	1	0	-1	-1
Row 7: Compare to Event 7:								1	1	1	3
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: NRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.0067	0.0025	0.0051	0.0025	0.0025	0.36	
	22-Jul-16	8-Dec-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	1	0	1	0	0	1	3
Row 2: Compare to Event 2:			0	0	1	0	1	0	0	1	3
Row 3: Compare to Event 3:				0	1	0	1	0	0	1	3
Row 4: Compare to Event 4:					1	0	1	0	0	1	3
Row 5: Compare to Event 5:						-1	-1	-1	-1	1	-3
Row 6: Compare to Event 6:							1	0	0	1	2
Row 7: Compare to Event 7:								-1	-1	1	-1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **12**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							X
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.054	0.13	0.05	0.12	0.074	0.074	0.21	0.025	0.2	0.2	
	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		1	-1	1	1	1	1	-1	1	1	5
Row 2: Compare to Event 2:			-1	-1	-1	-1	1	-1	1	1	-2
Row 3: Compare to Event 3:				1	1	1	1	-1	1	1	5
Row 4: Compare to Event 4:					-1	-1	1	-1	1	1	0
Row 5: Compare to Event 5:						0	1	-1	1	1	2
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **11**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							X
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000039	0.000005	0.000017	0.00026	0.000027	0.000034	0.000019	0.000017	0.000005	0.000033	
	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	13-Jul-21	
Row 1: Compare to Event 1:		-1	-1	1	-1	-1	-1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	1	1	1	1	1	0	1	7
Row 3: Compare to Event 3:				1	1	1	1	0	-1	1	4
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						1	-1	-1	-1	1	-1
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								-1	-1	1	-1
Row 8: Compare to Event 8:									-1	1	0
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.14	0.19	0.35	0.18	0.13	0.13	0.2	0.15	0.16	0.17	
	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		1	1	1	-1	-1	1	1	1	1	5
Row 2: Compare to Event 2:			1	-1	-1	-1	1	-1	-1	-1	-4
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					-1	-1	1	-1	-1	-1	-4
Row 5: Compare to Event 5:						0	1	1	1	1	4
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	SRC-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	42	54	290	43	46	47	98	43	86	65	
	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		1	1	1	1	1	1	1	1	1	9
Row 2: Compare to Event 2:			1	-1	-1	-1	1	-1	1	1	0
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	0	1	1	5
Row 5: Compare to Event 5:						1	1	-1	1	1	3
Row 6: Compare to Event 6:							1	-1	1	1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **10**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							X
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: SRC-1-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0057	0.0025	0.0062	0.047	0.0062	0.0073	0.0025	0.0025	0.0025	0.0073	
	8-Dec-16	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	1	1	1	1	-1	-1	-1	1	1
Row 2: Compare to Event 2:			1	1	1	1	0	0	0	1	5
Row 3: Compare to Event 3:				1	0	1	-1	-1	-1	1	0
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						1	-1	-1	-1	1	-1
Row 6: Compare to Event 6:							-1	-1	-1	0	-3
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-1**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.415	0.025	0.025	0.085	0.058	0.025	0.053	0.057	0.057		
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	16-Dec-21		
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	0	-8
Row 2: Compare to Event 2:			0	1	1	0	1	1	1	0	5
Row 3: Compare to Event 3:				1	1	0	1	1	1	0	5
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	0	-5
Row 5: Compare to Event 5:						-1	-1	-1	-1	0	-4
Row 6: Compare to Event 6:							1	1	1	0	3
Row 7: Compare to Event 7:								1	1	0	2
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2						X	
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-A-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000015	0.000005	0.000005	0.000005	0.000058	0.000005	0.000005	0.000005	0.000005		
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	16-Dec-21		
Row 1: Compare to Event 1:		-1	-1	-1	1	-1	-1	-1	-1	0	-6
Row 2: Compare to Event 2:			0	0	1	0	0	0	0	0	1
Row 3: Compare to Event 3:				0	1	0	0	0	0	0	1
Row 4: Compare to Event 4:					1	0	0	0	0	0	1
Row 5: Compare to Event 5:						-1	-1	-1	-1	0	-4
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7						X	
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.671	0.26	0.26	0.25	0.27	0.21	0.24	0.25	0.21		
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	16-Dec-21		
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	0	-8
Row 2: Compare to Event 2:			0	-1	1	-1	-1	-1	-1	0	-4
Row 3: Compare to Event 3:				-1	1	-1	-1	-1	-1	0	-4
Row 4: Compare to Event 4:					1	-1	-1	0	-1	0	-2
Row 5: Compare to Event 5:						-1	-1	-1	-1	0	-4
Row 6: Compare to Event 6:							1	1	0	0	2
Row 7: Compare to Event 7:								1	-1	0	0
Row 8: Compare to Event 8:									-1	0	-1
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-21**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21						X	
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	740	160	170	150	100	110	100	120	120		
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	16-Dec-21		
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	0	-8
Row 2: Compare to Event 2:			1	-1	-1	-1	-1	-1	-1	0	-5
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	0	-6
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	0	-5
Row 5: Compare to Event 5:						1	0	1	1	0	3
Row 6: Compare to Event 6:							-1	1	1	0	1
Row 7: Compare to Event 7:								1	1	0	2
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-18**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18						X	
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
X	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-A-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.014	0.0025	0.0025	0.0025	0.0025		
	23-Jul-13	22-Dec-14	18-Nov-15	8-Dec-16	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	16-Dec-21		
Row 1: Compare to Event 1:		0	0	0	1	0	0	0	0	0	1
Row 2: Compare to Event 2:			0	0	1	0	0	0	0	0	1
Row 3: Compare to Event 3:				0	1	0	0	0	0	0	1
Row 4: Compare to Event 4:					1	0	0	0	0	0	1
Row 5: Compare to Event 5:						-1	-1	-1	-1	0	-4
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0						X	
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.025	0.54	0.025	0.025	0.067	0.066	0.052	0.078			
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21			
Row 1: Compare to Event 1:		1	0	0	1	1	1	1	0	0	5
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	0	0	-6
Row 3: Compare to Event 3:				0	1	1	1	1	0	0	4
Row 4: Compare to Event 4:					1	1	1	1	0	0	4
Row 5: Compare to Event 5:						-1	-1	1	0	0	-1
Row 6: Compare to Event 6:							-1	1	0	0	0
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7					X		
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000005	0.000027	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005			
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21			
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	0	0	1
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	0	0	-6
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-5**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5					X		
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: COB-B-SW										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.25	0.48	0.19	0.2	0.2	0.24	0.22	0.22			
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21			
Row 1: Compare to Event 1:		1	-1	-1	-1	-1	-1	-1	0	0	-5
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	0	0	-6
Row 3: Compare to Event 3:				1	1	1	1	1	0	0	5
Row 4: Compare to Event 4:					0	1	1	1	0	0	3
Row 5: Compare to Event 5:						1	1	1	0	0	3
Row 6: Compare to Event 6:							-1	-1	0	0	-2
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-2**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2					X		
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	190	440	120	110	120	140	150	180			
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21			
Row 1: Compare to Event 1:		1	-1	-1	-1	-1	-1	-1	0	0	-5
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	0	0	-6
Row 3: Compare to Event 3:				-1	0	1	1	1	0	0	2
Row 4: Compare to Event 4:					1	1	1	1	0	0	4
Row 5: Compare to Event 5:						1	1	1	0	0	3
Row 6: Compare to Event 6:							1	1	0	0	2
Row 7: Compare to Event 7:								1	0	0	1
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **1**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1					X		
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-B-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025			
	18-Nov-15	8-Dec-16	18-Dec-17	23-Nov-18	13-Dec-19	21-Jul-20	1-Dec-20	16-Dec-21			
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart							
S	**Total No. of Sampling Events**						
Value	4	5	6	7	8	9	10
0					X		
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results		
X	No Trend Indicated, Plume Not Diminishing or Expanding	
X	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000014	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	1	1
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	1	1
Row 3: Compare to Event 3:				0	0	0	0	0	0	1	1
Row 4: Compare to Event 4:					0	0	0	0	0	1	1
Row 5: Compare to Event 5:						0	0	0	0	1	1
Row 6: Compare to Event 6:							0	0	0	1	1
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **9**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							X
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.063	0.025	0.057	0.025	0.025	0.025	0.054	0.025	0.66	0.025	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	1	-1	-7
Row 2: Compare to Event 2:			1	0	0	0	1	0	1	0	3
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	1	-1	-5
Row 4: Compare to Event 4:					0	0	1	0	1	0	2
Row 5: Compare to Event 5:						0	1	0	1	0	2
Row 6: Compare to Event 6:							1	0	1	0	2
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000011	0.00001	0.000005	0.000014	0.000005	0.000015	0.000005	0.000005	0.000005	0.00008	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	1	-1	1	-1	-1	-1	1	-3
Row 2: Compare to Event 2:			-1	1	-1	1	-1	-1	-1	1	-2
Row 3: Compare to Event 3:				1	0	1	0	0	0	1	3
Row 4: Compare to Event 4:					-1	1	-1	-1	-1	1	-2
Row 5: Compare to Event 5:						1	0	0	0	1	2
Row 6: Compare to Event 6:							-1	-1	-1	1	-2
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-1**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.45	0.11	0.43	0.13	0.23	0.11	0.34	0.17	0.27	0.1	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	1	1	0	1	1	1	-1	5
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	-1	1	1	1	-1	2
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	1	1	-1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-12**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							X
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	110	42	100	41	69	43	99	57	91	40	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	-1	1	1	1	1	1	-1	4
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	1	1	1	1	-1	4
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	1	1	-1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-11**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							X
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-4-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0051	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0058	0.021	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		1	0	0	0	0	0	0	1	1	3
Row 2: Compare to Event 2:			-1	-1	-1	-1	-1	-1	1	1	-4
Row 3: Compare to Event 3:				0	0	0	0	0	1	1	2
Row 4: Compare to Event 4:					0	0	0	0	1	1	2
Row 5: Compare to Event 5:						0	0	0	1	1	2
Row 6: Compare to Event 6:							0	0	1	1	2
Row 7: Compare to Event 7:								0	1	1	2
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **12**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							X
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Anthracene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Pyrene	0.000017	0.000012	0.000005	0.00001	0.000005	0.000015	0.000005	0.000005	0.000005	0.000012	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			-1	-1	-1	1	-1	-1	-1	0	-5
Row 3: Compare to Event 3:				1	0	1	0	0	0	1	3
Row 4: Compare to Event 4:					-1	1	-1	-1	-1	1	-2
Row 5: Compare to Event 5:						1	0	0	0	1	2
Row 6: Compare to Event 6:							-1	-1	-1	-1	-4
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-12**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							X
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Benzo(a)pyrene	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	0	0	0	0	0	0	0	0
Row 2: Compare to Event 2:			0	0	0	0	0	0	0	0	0
Row 3: Compare to Event 3:				0	0	0	0	0	0	0	0
Row 4: Compare to Event 4:					0	0	0	0	0	0	0
Row 5: Compare to Event 5:						0	0	0	0	0	0
Row 6: Compare to Event 6:							0	0	0	0	0
Row 7: Compare to Event 7:								0	0	0	0
Row 8: Compare to Event 8:									0	0	0
Row 9: Compare to Event 9:										0	0

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **0**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							X
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.059	0.025	0.062	0.025	0.025	0.025	0.081	0.025	0.093	0.053	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	1	-1	-1	-1	1	-1	1	-1	-3
Row 2: Compare to Event 2:			1	0	0	0	1	0	1	1	4
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	1	-1	-3
Row 4: Compare to Event 4:					0	0	1	0	1	1	3
Row 5: Compare to Event 5:						0	1	0	1	1	3
Row 6: Compare to Event 6:							1	0	1	1	3
Row 7: Compare to Event 7:								-1	1	-1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000011	0.00001	0.000005	0.000015	0.000005	0.000014	0.000016	0.000005	0.000005	0.000018	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	1	-1	1	1	-1	-1	1	-1
Row 2: Compare to Event 2:			-1	1	-1	1	1	-1	-1	1	0
Row 3: Compare to Event 3:				1	0	1	1	0	0	1	4
Row 4: Compare to Event 4:					-1	-1	1	-1	-1	1	-2
Row 5: Compare to Event 5:						1	1	0	0	1	3
Row 6: Compare to Event 6:							1	-1	-1	1	0
Row 7: Compare to Event 7:								-1	-1	1	-1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							X
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.5	0.16	0.35	0.14	0.3	0.15	0.43	0.18	0.34	0.15	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	-1	1	-1	1	1	1	-1	2
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	-1	-1	-5
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	1	1	0	3
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-8**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							X
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	0.11	0.048	0.095	0.045	0.076	0.049	0.11	0.054	0.1	49	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	0	-1	-1	1	-6
Row 2: Compare to Event 2:			1	-1	1	1	1	1	1	1	6
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	1	1	-1
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	1	-1	1	1	1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	1	-1
Row 8: Compare to Event 8:									1	1	2
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **12**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							X
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	COB-6-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.0025	0.0064	0.0025	0.0025	0.0025	0.0025	0.0025	0.0057	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	0	1	0	0	0	0	0	1	2
Row 2: Compare to Event 2:			0	1	0	0	0	0	0	1	2
Row 3: Compare to Event 3:				1	0	0	0	0	0	1	2
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						0	0	0	0	1	1
Row 6: Compare to Event 6:							0	0	0	1	1
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							X
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	0.43	0.025	0.11	0.025	0.025	0.025	0.55	0.025	0.053	0.025	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	0	0	0	1	0	1	0	3
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	-1	-1	-5
Row 4: Compare to Event 4:					0	0	1	0	1	0	2
Row 5: Compare to Event 5:						0	1	0	1	0	2
Row 6: Compare to Event 6:							1	0	1	0	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.000027	0.000027	0.000024	0.00015	0.000021	0.000027	0.000087	0.000027	0.000024	0.000035	
	3-Aug-16	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-09	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	-1	1	-1	0	1	0	-1	1	0
Row 2: Compare to Event 2:			-1	1	-1	0	1	0	-1	1	0
Row 3: Compare to Event 3:				1	-1	1	1	1	0	1	4
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						1	1	1	1	1	5
Row 6: Compare to Event 6:							1	0	-1	1	1
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									-1	1	0
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **2**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							X
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	0.94	0.049	0.32	0.05	0.12	0.039	1.2	0.058	0.16	0.033	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	1	1	-1	1	1	1	-1	4
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	-1	-1	-5
Row 4: Compare to Event 4:					1	-1	1	1	1	-1	2
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	1	1	-1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-9**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							X
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	230	8.3	71	6.5	16	7.5	330	7.5	38	6.7	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	-1	1	-1	1	-1	1	-1	0
Row 3: Compare to Event 3:				-1	-1	-1	1	-1	-1	-1	-5
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	1	-1	1	-1	-1
Row 6: Compare to Event 6:							1	0	1	-1	1
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									1	-1	0
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-10**

Confidence Level Chart

S	Total No. of Sampling Events						
Value	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							X
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	WB-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.0025	0.0025	0.006	0.16	0.0025	0.005	0.0069	0.0025	0.0069	0.0025	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		0	1	1	0	1	1	0	1	0	5
Row 2: Compare to Event 2:			1	1	0	1	1	0	1	0	5
Row 3: Compare to Event 3:				1	-1	-1	1	-1	1	-1	-1
Row 4: Compare to Event 4:					-1	-1	-1	-1	-1	-1	-6
Row 5: Compare to Event 5:						1	1	0	1	0	3
Row 6: Compare to Event 6:							1	-1	1	-1	0
Row 7: Compare to Event 7:								-1	0	-1	-2
Row 8: Compare to Event 8:									1	0	1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
		CV<=1	Plume is Stable
	X	CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	3.6	0.34	3.5	0.42	3.1	0.36	3.2	3.6	2.9	0.38	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	0	-1	-1	-8
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	-1	-1	-1	1	-1	-1	-5
Row 4: Compare to Event 4:					1	-1	1	1	1	-1	2
Row 5: Compare to Event 5:						-1	1	1	-1	-1	-1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-4**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							X
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.00005	0.00002	0.00005	0.000024	0.00005	0.000021	0.00011	0.00005	0.00005	0.000028	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	1	0	0	-1	-3
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	0	-1	1	0	0	-1	-2
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	1	0	0	-1	-1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									0	-1	-1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **5**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							X
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
X		CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	6.1	0.63	5.9	0.73	5	0.34	5.5	5.6	4.8	0.67	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	1	1	-1	1	1	1	1	6
Row 3: Compare to Event 3:				-1	-1	-1	-1	-1	-1	-1	-7
Row 4: Compare to Event 4:					1	-1	1	1	1	-1	2
Row 5: Compare to Event 5:						-1	1	1	-1	-1	-1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								1	-1	-1	-1
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-9**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							X
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW									
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	2000	210	1900	250	1700	250	2100	2100	1900	260	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	1	1	-1	-1	-5
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	-1	-1	1	1	0	-1	-2
Row 4: Compare to Event 4:					1	0	1	1	1	1	5
Row 5: Compare to Event 5:						-1	1	1	1	-1	1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								0	-1	-1	-2
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO:	BP-1-SW								
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.025	0.0025	0.025	0.0025	0.025	0.0025	0.025	0.025	0.025	0.0067	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	0	0	-1	-4
Row 2: Compare to Event 2:			1	0	1	0	1	1	1	1	6
Row 3: Compare to Event 3:				-1	0	-1	0	0	0	-1	-3
Row 4: Compare to Event 4:					1	0	1	1	1	1	5
Row 5: Compare to Event 5:						-1	0	0	0	-1	-2
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								0	0	-1	-1
Row 8: Compare to Event 8:									0	-1	-1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **3**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							X
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Boron	3.6	0.21	2.8	0.26	3	0.18	3.2	2.6	2.5	0.28	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	1	1	-1	1	1	1	1	6
Row 3: Compare to Event 3:				-1	1	-1	1	-1	-1	-1	-3
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	1	-1	-1	-1	-3
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-7**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							X
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Cadmium	0.00005	0.000018	0.00005	0.000021	0.00005	0.000021	0.00013	0.00005	0.00005	0.000052	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	1	0	0	1	-1
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	0	-1	1	0	0	1	0
Row 4: Compare to Event 4:					1	0	1	1	1	1	5
Row 5: Compare to Event 5:						-1	1	0	0	1	1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **16**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							X
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
X	S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Strontium	6.1	0.45	5	0.5	5	0.66	5.6	4.5	4.1	0.58	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	-1	-1	-1	-1	-9
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	0	-1	1	-1	-1	-1	-4
Row 4: Compare to Event 4:					1	1	1	1	1	1	6
Row 5: Compare to Event 5:						-1	1	-1	-1	-1	-3
Row 6: Compare to Event 6:							1	1	1	-1	2
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									-1	-1	-2
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **-6**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							X
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Sulphate	2000	150	1700	180	1700	120	2100	1700	1700	250	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	-1	-1	-1	-1	1	-1	-1	-1	-7
Row 2: Compare to Event 2:			1	1	1	-1	1	1	1	1	6
Row 3: Compare to Event 3:				-1	0	-1	1	0	0	-1	-2
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	1	0	0	-1	-1
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								-1	-1	-1	-3
Row 8: Compare to Event 8:									0	-1	-1
Row 9: Compare to Event 9:										-1	-1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = -1

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							X
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

X	No Trend Indicated, Plume Not Diminishing or Expanding		
	X	CV<=1	Plume is Stable
		CV>1	Plume is Fluctuating
	Trend Is Present (≥90% Confidence)		
		S < 0	Diminishing Plume
		S > 0	Expanding Plume

MANN-KENDALL PLUME STABILITY ANALYSIS

LTMM Surface Water Monitoring
NS Lands
Sydney, Nova Scotia

MANN-KENDALL ANALYSIS OF PLUME	MONITORING WELL NO: Narrows										
	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10	Sum Rows
Zinc	0.025	0.0058	0.025	0.0088	0.025	0.0072	0.025	0.025	0.025	0.053	
	3-Aug-17	18-Dec-17	25-Jul-18	23-Nov-18	29-Jul-19	13-Dec-19	21-Jul-20	1-Dec-20	13-Jul-21	16-Dec-21	
Row 1: Compare to Event 1:		-1	0	-1	0	-1	0	0	0	1	-2
Row 2: Compare to Event 2:			1	1	1	1	1	1	1	1	8
Row 3: Compare to Event 3:				-1	0	-1	0	0	0	1	-1
Row 4: Compare to Event 4:					1	-1	1	1	1	1	4
Row 5: Compare to Event 5:						-1	0	0	0	1	0
Row 6: Compare to Event 6:							1	1	1	1	4
Row 7: Compare to Event 7:								0	0	1	1
Row 8: Compare to Event 8:									0	1	1
Row 9: Compare to Event 9:										1	1

1/2 detection limit used for analytical results having no concentrations detected; historical data assumed EQL of 0.001 mg/L

Mann-Kendall (S) Statistic = **16**

Confidence Level Chart

S Value	Total No. of Sampling Events						
	4	5	6	7	8	9	10
0							
± 1							
± 2							
± 3							
± 4							
± 5							
± 6							
± 7							
±8							
± 9							
± 10							
± 11							
± 12							
± 13							
± 14							
± 15							
± 16							X
± 17							
± 18							
± 19							
± 20							
± 21							
± 22							
± 23							
± 24	Not Physically possible						
± 25							
± 26							
± 27							
± 28							
± 29							
± 30							
± 31							
± 32							
± 33							
± 34							
± 35							
± 36							
± 37							
± 38							
± 39							
± 40							
± 41							
± 42							
± 43							
± 44							
± 45							

Unshaded area indicates no trend
stable trend (if CV=<1)
fluctuating (if CV>1)

Shaded area indicates
Expanding trend if S>0
Declining trend if S<0

Stability Evaulation Results

	No Trend Indicated, Plume Not Diminishing or Expanding	
	CV<=1	Plume is Stable
	CV>1	Plume is Fluctuating
X	Trend Is Present (≥90% Confidence)	
	S < 0	Diminishing Plume
X	S > 0	Expanding Plume