



Appendix B.5

Final - Surface Water Quality Baseline Report,
Golder Associates



REPORT

Fifteen Mile Stream Gold Project
Surface Water Quality Baseline

Submitted to:

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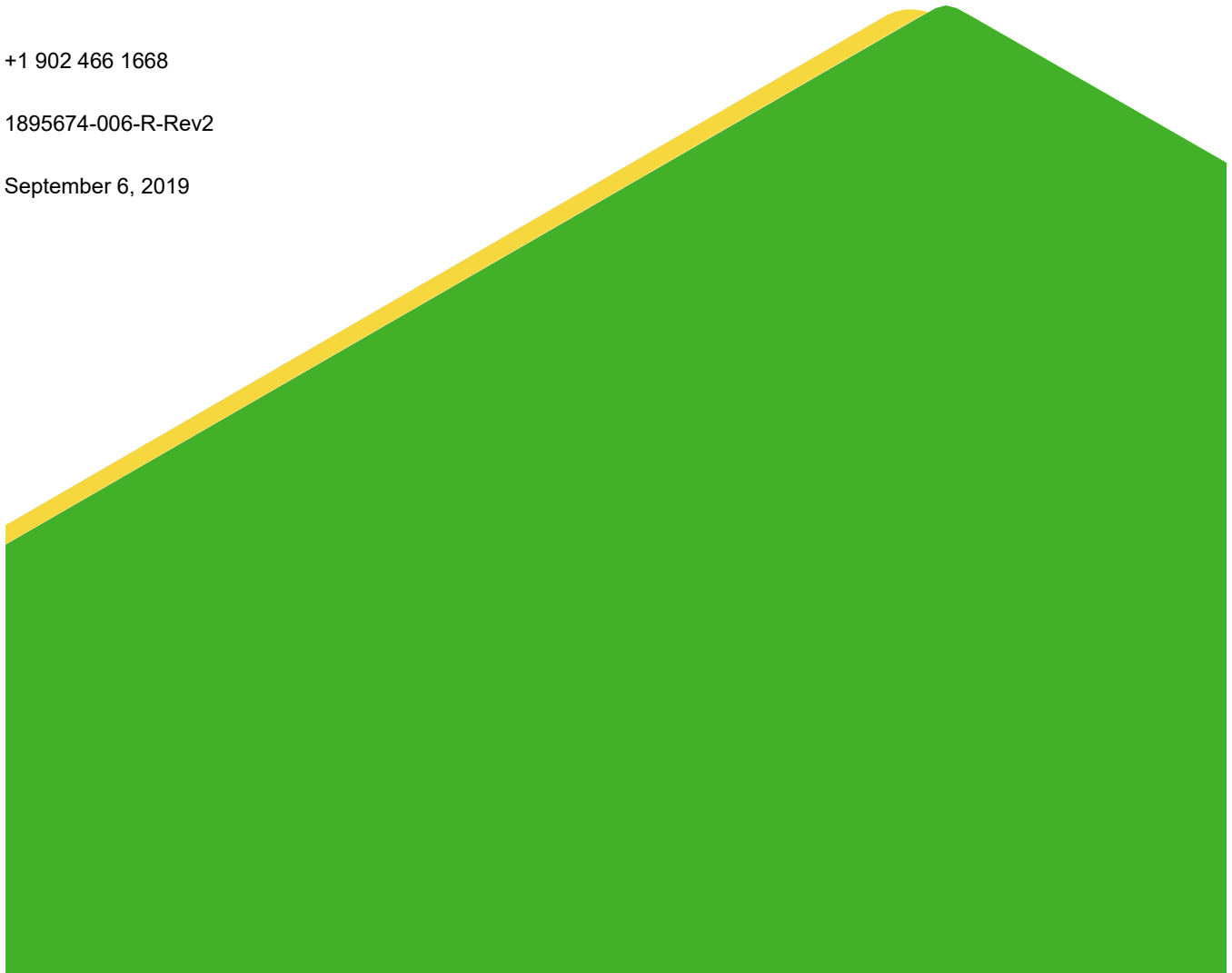
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Distribution List

1 PDF Copy - Atlantic Mining NS Corp

1 PDF Copy - Golder Associates Ltd.

Executive Summary

Atlantic Mining NS Corp (AMNS), a wholly owned subsidiary of St. Barbara Ltd., is planning to develop the Fifteen Mile Stream Gold Project (the Project) located approximately 115 km east of Halifax, in Halifax County, in the province of Nova Scotia. A surface water quality baseline study was undertaken to support the Environmental Impact Statement (EIS) process.

The objective of the surface water quality baseline study is to establish the surface water quality conditions within the Project study area and receiving environment, prior to development. The quality of surface water bodies within and upstream of the Project study area were considered to record pre-Project water qualities, and the quality of surface water bodies situated downstream of the Project were considered to permit assessment and monitoring of potential Project related effects on the aquatic environment.

The surface water quality baseline monitoring program was initiated in July 2017 by McCallum Environmental. The current baseline surface water quality program comprises a total of 15 stations (14 watercourse monitoring locations and one lake profile location in Anti-Dam Flowage). Samples are collected quarterly (March, June, September, and December) to represent a range of hydrologic and environmental influences, including the late fall low flow period, late winter/early spring transition, and typical ice-free spring and summer flows. Field duplicate, field blank, and trip blank samples have been collected in addition to the analytical laboratory's internal quality assurance program.

Baseline surface water quality monitoring results are compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG), Water Quality Guidelines for the Protection of Aquatic Life, and the Nova Scotia Environmental Quality Standards (NSEQS) for Surface Water (Table 3).

The baseline water quality at the 14 watercourse stations can be generally characterized as having acidic to sub-neutral pH typically below the CEQG. Concentrations of total aluminum were greater than the CEQG in all samples, and concentrations of total iron were greater than the CEQG in 18% of samples; exceedances of CEQG for these parameters appear to be a naturally occurring condition within the vicinity of the Fifteen Mile Stream study area. Concentrations of total arsenic were greater than the CEQG in 25% of samples. All samples collected at SW-4 had arsenic concentrations greater than the CEQG; this may be related to historical mining activities and wastes which predate the Project. Concentrations greater than the CEQG or NSEQS were noted for the following additional parameters at watercourse stations: total copper (2% of samples), dissolved zinc (10% of samples), total mercury (2% of samples), total lead (<1% of samples), and total manganese (<1% of samples).

The baseline water quality at the Ant-Dam Flowage lake profile station can be generally characterized as having acidic to sub-neutral pH below the CEQG and concentrations greater than the CEQG or NSEQS in at least one sample for the following parameters: total aluminum, total arsenic, and total iron. Metals concentrations are similar between the shallow and deep profile station samples, and no consistent differences over time have been identified.

A review of available QA/QC data from the laboratory and through evaluation of field duplicates and field blanks indicates analytical results to date to be of acceptable quality.

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1.0 INTRODUCTION

Atlantic Mining NS Corp (AMNS), a wholly owned subsidiary of St. Barbara Ltd., is planning to develop the Fifteen Mile Stream Gold Project (the Project) located approximately 115 km east of Halifax, in Halifax County, in the province of Nova Scotia (Figure 1).

This factual report presents the results of the surface water quality baseline study, with the objective of supporting the Environmental Impact Statement (EIS) process.

1.1 Overview of the Fifteen Mile Stream Project

AMNS is planning to construct, operate, and eventually reclaim a new open pit gold mine within the Fifteen Mile Stream study area, which is defined by the red boundary noted on Figure 1. The quality of surface water bodies within and upstream of the Project study area were considered to record pre-Project water qualities, and the quality of surface water bodies situated downstream of the Project were considered to permit assessment and monitoring of potential Project related effects on the aquatic environment. The proposed site infrastructure layout is also presented in Figure 1, which may be refined as a result of ongoing consultation and engineering studies. The key Project components are expected to consist of:

- Open pit
- Tailings Management Facility
- Ore Stockpile
- Waste Rock Stockpile
- Till Stockpile
- Plant Site

These facilities will be supported by other infrastructure, as required, during the construction, operations, and closure of the Project.

2.0 OBJECTIVES

The objective of the surface water quality baseline study is to establish the surface water quality conditions within the Project study area and receiving environment, prior to development. In the context of this report, the term “baseline” is used to describe the existing conditions at reported surface water quality stations, as encountered during the time period of the surface water quality study.

The scope of work for the surface water quality baseline study is summarized as follows:

- 1) Compilation of surface water quality data and comparison to relevant water quality criteria for screening purposes only, to identify constituents of interest under baseline conditions.
- 2) Analysis and interpretation of surface water quality data to characterize the baseline conditions.

3.0 METHODOLOGY

3.1 Surface Water Quality Monitoring

Surface water quality baseline monitoring has been completed at numerous stations in the surface water environment, within or adjacent to the Project study area (Figure 2). Baseline water quality stations were selected with the objective of recording upstream, midstream, and downstream surface water quality in relation to the proposed mine infrastructure within local lakes, reservoirs, rivers, and streams.

Samples are collected quarterly (March, June, September, December) to represent a range of hydrologic and environmental influences, including the late fall low flow period, late winter/early spring transition, and typical ice-free spring and summer flows. The surface water samples are collected, shipped, and submitted under chain-of-custody to Maxxam Analytics, in Bedford, Nova Scotia, for analysis. Samples are submitted immediately after sample collection (i.e., same day) in order to meet the minimum hold times for laboratory analysis. The complete standard operating procedure for the Fifteen Mile Stream surface water monitoring program is presented in McCallum (2019).

The surface water quality program was initiated in July 2017. The baseline program originally entailed eight surface water stations (SW-1 to SW-8) that focused on analysis of routine general chemistry, total metals, and total mercury. The program expanded in the following quarter to include five supplementary stations (SW-9 to SW-13). In April 2018 routine analysis expanded to include dissolved mercury.

The monitoring program was revised in September 2018 to include supplementary monitoring stations (SW-14 and SW-16), a water column profile at the existing SW-13 location, and a more comprehensive list of analytical parameters.

The current baseline surface water quality program comprises a total of 15 stations. Fourteen of these locations monitor the surface water quality per quarter. One station (SW-13) encompasses a water quality profile with the objective of targeting deeper water in the Anti-Dam Flowage (reservoir) by obtaining field parameters at 1-meter intervals from surface to bottom depth and two water quality samples: one near lakebed (SW13-D) and one near-surface (SW13-S). Details on the surface water quality station locations are summarized in Table 1.

Table 1: Surface Water Quality Baseline Stations

Station	Waterbody Name	Station Description	UTM Northing (NAD83 Zone 20N)	UTM Easting (NAD83 Zone 20N)
East River/Sheet Harbour Watershed				
SW-1	Unnamed stream	Stream flows through the FMS Study Area before it converges with Fifteen Mile Stream.	4999553	537062
SW-2	Seloam Lake (outlet)	Seloam Lake is a headwater lake, upstream of the FMS Study Area, and one of the two options to receive the discharge of treated effluent.	5000001	538363
SW-3	Unnamed pond	Pond is within the FMS Study Area and the footprint of the proposed TMF.	4998181	539486
SW-4	Unnamed stream	Stream flows through the FMS Study Area and the proposed open pit footprint.	4998675	537353
SW-5	Seloam Brook	Brook flows through the northwest corner of the FMS Study Area and converges with surface water flows from the majority of the FMS Study Area.	4998993	535917
SW-6	Anti Dam Flowage (outlet)	Anti Dam Flowage Reservoir is downstream of the FMS Study Area and one of the two options to receive the discharge of treated effluent.	4994294	539624
SW-7	Unnamed stream	Small stream converges with Fifteen Mile Stream downstream of the FMS Study Area.	4998109	535437
SW-8	Fifteen Mile Stream	Reference station located to the northwest (upstream) of the FMS Study Area.	5000430	535081
SW-9	Seventeen Mile Stream	Reference station located to the northwest (upstream) of the FMS Study Area.	5002178	534552
SW-10	Grassy Lake	Reference station located to the northwest (upstream) of the FMS Study Area.	5003448	535003
SW-12	East Lake	Small lake located in the southeast corner of the FMS Study Area and downgradient of the proposed TMF footprint.	4997710	540507
SW-13	Anti-Dam Flowage (profile)	Anti Dam Flowage is downstream of the FMS Study Area and one of the two options to receive the discharge of treated effluent.	4994730	540241
SW-14	Fifteen Mile Stream	Stream is located west of the FMS Study Area and downstream of SW-5 and SW-7.	4998025	535409
SW-16	Seloam Brook	Station located NW of proposed site facilities.	4998633	536851
Moser River Watershed				
SW-11	Moser Lake	Reference lake located to east of the FMS Study Area and within a separate watershed (not expected to be influenced by the Project).	4999679	540996

3.2 Laboratory Analysis and QA/QC

Water samples are analysed by Maxxam Analytics for the parameters presented in Appendix A and Appendix B, excluding field measurements. Laboratory certificates are presented in Appendix C and include laboratory quality assurance reports for samples collected in 2017; laboratory quality assurance reports for samples collected in 2018 are not available. Laboratory quality assurance reporting identifies data with respect to the following thresholds:

- Matrix spike values within range of 80 to 120%
- Spiked blank values within range of 80 to 120%
- Method blank values less than twice the method detection limit
- Relative percent difference (RPD) values less than 20%

Of the seventy-five sample results in the baseline water quality study with laboratory quality assurance reports, all laboratory reported quality assurance data met the criteria described above.

QA/QC procedures are in place for sampling, shipment, and laboratory analyses (lab certificates). The QA/QC procedure has been increased by the addition of field duplicate and field blank samples in September 2018, and trip blanks in March 2019. Field duplicate and field blank samples are presented in Appendix B and evaluated with respect to the RPD and method blank criteria described above, respectively; with key results summarized as follows:

- RPD between a duplicate sample and the corresponding normal sample exceeded 20% for a single parameter in each duplicate sample in September (turbidity) and December (dissolved manganese) 2018. The two duplicate samples and their corresponding normal samples collected in March 2019 contained RPD values greater than 20% for one to two parameters in each sample (TDS in both samples and methylmercury at SW1). The two duplicate samples and their corresponding normal samples collected in June 2019 contained RPD values greater than 20% for one to three parameters in each sample (TDS, dissolved aluminum, dissolved manganese, and methylmercury).
- A total of eight field blank samples were submitted, and nine parameter results were reported at concentrations greater than twice the method detection limit. Three of the results were reported for dissolved sodium, while no other parameter exceeded field blank criteria more than once. Each field blank reported between zero to three, results in excess of the field blank criteria. All field blank results greater than twice the method detection limit were less than ten times the method detection limit, with the exception of dissolved organic carbon in March 2019 field blank #2.
- A total of six trip blank samples were submitted, and three parameter results (turbidity, conductivity, and total aluminum) were reported at concentrations greater than twice the method detection limit. Two of these results occurred in March 2019 trip blank #1, while the other result occurred in June 2019 trip blank #2. Dissolved metals were not analysed in the trip blanks. All trip blank results greater than twice the method detection limit were less than ten times the method detection limit.
- All other QA/QC values met evaluation criteria.

In summary, review of available QA/QC data from the laboratory and through evaluation of field duplicates and field blanks indicates analytical results to date to be of acceptable quality. The existing QA/QC program is based on preliminary data collection and will be enhanced with additional sampling events.

4.0 RESULTS

4.1 Comparison Criteria

The results of the baseline surface water quality study are compared to the following criteria, applicable to the Project location for freshwater, non-potable purposes:

- Canadian Council of Ministers of the Environment (CCME 1999, updated in 2018). Canadian Environmental Quality Guidelines (CEQG), Water Quality Guidelines for the Protection of Aquatic Life.
- Nova Scotia Environmental Quality Standards for Surface Water, Table 3 (2013).

For parameters where the criteria are dependent on pH and hardness, guidelines were calculated as per the method outlined by CCME (2018).

The complete analyte list and comparison criteria for surface water quality are provided in Appendix A.

It should be noted that these criteria are used in this baseline report for screening purposes only, to identify constituents which may require further evaluation and are not related to surface water quality effects or impact assessment.

4.2 Surface Water Quality

Section 4.2.1 and 4.2.2 summarize the surface water quality results available as of the end of July 2019. The current data set does not provide sufficient data points to statistically evaluate seasonal influences. Surface water quality monitoring is on-going and future updates may permit increased interpretation of seasonal influences.

4.2.1 Watercourse Stations

Surface water quality results for samples collected by McCallum Environmental in 2017 through 2019 are presented in Appendix A and summarized in Table 2. Certain general parameters, major ions, dissolved metals, and methylmercury have only been reported for four sampling events (September 2018 through June 2019).

Based on results reported as of July 2019, the surface water quality can be characterized as:

- Acidic to sub-neutral pH values, with approximately 95% of field pH and 96% of lab pH values not meeting the chronic CEQG (6.5 – 9.0). The lowest pH (3.2) was observed in laboratory measurements from the sample collected at SW-11 in October 2017. Acidic pH values are spatially well distributed across all stations and appear to be a naturally occurring condition of surface water within the vicinity of the Fifteen Mile Stream study area.

- All total aluminum concentrations were greater than chronic CEQG (pH dependant, 0.10 – 0.0050 mg/L) and NSEQS (0.0050 mg/L). The maximum concentration (0.38 mg/L) was observed at SW-12 in July 2018. Total aluminum concentrations are spatially well distributed across all stations and appear to be a naturally occurring condition of surface water within the vicinity of the Fifteen Mile Stream study area.
- Approximately 35% of total arsenic concentrations were greater than chronic CEQG (0.0050 mg/L) and NSEQS (0.0050 mg/L); the concentrations greater than the chronic CEQG and NSEQS occur at stations SW-4, SW-5, SW-6, SW-13, SW-14, and SW-16. 100% of samples at SW-4 exceed the total arsenic criteria. The maximum concentration (0.34 mg/L) was observed at SW-4 in September 2018. Golder understands that arsenic concentrations in surface water bodies may be related to historical mining activities and wastes which predate the Project.
- Approximately 2% of total copper concentrations were greater than chronic CEQG (0.002 mg/L). The maximum concentration (0.0089 mg/L) was observed at SW-1 in March 2019.
- Approximately 18% of total iron concentrations were greater than chronic CEQG (0.30 mg/L) and NSEQS (0.30 mg/L). The maximum concentration (4.8 mg/L) was observed at SW-4 in September 2018. Total iron values above guidelines are spatially well distributed both upstream and downstream of the Fifteen Mile Stream study area and appear to be a naturally occurring condition.
- Of the six instances in which dissolved zinc concentrations were greater than the chronic CEQG (0.0070 mg/L), four of these samples contained dissolved zinc concentrations greater than twice the reported value for total zinc (the total zinc result was below detection limit in all five instances). However, these dissolved values are reported at concentrations within three times the method detection limit, and this variability is within acceptable ranges. Including the suspect results, approximately 10% of dissolved zinc concentrations were greater than chronic CEQG (0.0070 mg/L). The maximum concentration (0.018 mg/L) was observed at SW-8 in March 2019.
- Approximately 2% of total mercury concentrations were greater than chronic CEQG (0.000026 mg/L); the concentrations greater than the chronic CEQG were observed at SW-4. The maximum concentration (0.000030 mg/L) was observed at SW-4 in July 2017.
- Values of total lead and total manganese were greater than applicable chronic CEQG or NSEQS criteria in a single sample (i.e., less than 1% of all samples analysed). Both values occurred in samples collected from SW-4 and were less than twice the applicable chronic CEQG or NSEQS criteria value.
- Concentrations of all other parameters analyzed were less than the CEQGs and NSEQS.

Table 2: Summary of Surface Water Quality Data Comparisons to Criteria

Parameter	Criteria (mg/L)		Number of Samples	Samples Values not Meeting Criteria		Location
	CEQG Chronic ¹	NSEQS ²		CEQG Chronic ¹	NSEQS ²	
Field pH	6.5 – 9.0	-	111	n=105 95%	-	All Stations
Lab pH	6.5 – 9.0	-	120	n=115 96%	-	All Stations
Total Aluminum	0.10 - 0.0050 ³	0.0050	120	n=120 100%	n=120 100%	All Stations
Total Arsenic	0.0050	0.0050	120	n=22 18%	n=22 18%	SW-4, SW-5, SW-6, SW-14
Total Copper	0.002 ³	0.002	120	n=2 2%	n=2 2%	SW-1, SW-4
Total Iron	0.30	0.30	120	n=42 35%	n=42 35%	SW-1, SW-4, SW-5, SW-6, SW-7, SW-8, SW-10, SW-11, SW-12, SW-13, SW-14
Total Lead	0.0010	0.0010	120	n=1 1%	n=1 1%	SW-4
Total Manganese	-	0.82	120	-	n=1 1%	SW-4
Dissolved Zinc	0.0070	-	61	n=6 ⁴ 10%	-	SW-1, SW-4, SW-8, SW-14
Total Mercury	0.000026	0.000026	120	n=2 2%	n=2 2%	SW-4

Notes:

1. Canadian Council of Ministers of the Environment (1999, updated in 2018). Canadian Environmental Quality Guidelines (CEQG) for the Protection of Aquatic Life.
2. Nova Scotia Environmental Quality Standards for Surface Water, Table 3 (2013).
3. Criteria varies with pH or hardness.
4. Four of six values are suspect, due to the dissolved zinc concentration reported at greater than 2x the total zinc concentration.

4.2.2 Lake Profile Stations

In September 2018, the SW-13 monitoring location was revised and became a water quality profile station (results prior to September 2018 are discussed in Section 4.2.1). Field parameters were taken at 1-meter intervals from surface to bottom depth and two samples obtained from the station location, one near lakebed sample (SW13-D) and one near-surface sample (SW13-S).

Both SW13-S and SW13-D are characterized by similar water quality for the four collection rounds. All samples are characterized by acidic to sub-neutral conditions, with all lab pH values below the chronic CCME guideline value (<6.5). Field pH collected at profile depths were all out of range of the chronic CCME guideline (<6.5). Total aluminum exceeded the chronic CCME guideline (0.0050 mg/L) in all samples. Total arsenic and total iron values exceeded the chronic CCME guideline values (0.0050 mg/L and 0.30 mg/L, respectively) in both SW-13S and SW-13D samples collected in September 2018. In general, metals concentrations are similar between SW-13S and SW-13D samples and no consistent differences over time have been identified.

Table 3 outlines the field parameters for the water quality profile, this table can be used in conjunction with the surface water quality results found in Appendix A.

Table 3: Water Quality Profile Field Parameter Summary for SW-13

Parameter	Unit	CEQG	NSEQS	Surface	1m	2m	3m	4m	5m	6m	7m	8m
September 2018												
Temperature	°C	-	-	17.56	17.54	17.36	16.26	15.98	-	-	-	-
pH	pH units	6.5 – 9.0	-	5.1	5.1	5.0	4.9	4.6	-	-	-	-
Conductivity	µS/cm	-	-	0.026	0.027	0.027	0.027	0.027	-	-	-	-
Total Dissolved Solids	g/L	-	-	0.017	0.017	0.017	0.018	0.018	-	-	-	-
Turbidity	NTU	-	-	12.2	12.7	14.0	14.5	14.8	-	-	-	-
Dissolved Oxygen	mg/L	-	-	9.10	8.52	8.62	7.90	7.57	-	-	-	-
December 2018												
Temperature	°C	-	-	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
pH	pH	6.5 – 9.0	-	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	5.1
Conductivity	µS/cm	-	-	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Turbidity	NTU	-	-	0.73	-	-	-	-	-	-	0.81	-
Dissolved Oxygen	mg/L	-	-	13.18	13.04	12.84	12.76	12.82	12.83	12.75	12.76	11.98
ORP	mV	-	-	329.4	328.1	327.2	323.8	321.8	323.7	324.3	324.7	317.8
March 2019												
Temperature	°C	-	-	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8	-
pH	pH units	6.5 – 9.0	-	5.2	5.0	4.9	4.9	5.0	5.0	5.0	5.0	-
Conductivity	µS/cm	-	-	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015	-
Turbidity	NTU	-	-	1.17	-	-	-	-	-	-	1.15	-
Dissolved Oxygen	mg/L	-	-	12.99	12.7	12.68	12.65	12.85	12.59	12.58	12.58	-
ORP	mV	-	-	192.8	212.7	218.7	221	221.9	224.3	225.4	225.6	-
June 2019												
Temperature	°C	-	-	13.8	13.7	13.7	13.4	12.2	11.8	11.6	11.5	-
pH	pH units	6.5 – 9.0	-	5.6	5.3	5.2	5.3	5.2	5.1	5.0	5.0	-
Conductivity	µS/cm	-	-	0.019	0.019	0.019	0.019	0.018	0.018	0.018	0.018	-
Turbidity	NTU	-	-	0.83	-	-	-	-	-	-	1.05	-
Dissolved Oxygen	mg/L	-	-	11.43	10.20	10.13	10.05	10.03	10.1	9.99	9.20	-
ORP	mV	-	-	212.0	217.8	221.0	218.8	218.6	229.9	232.5	234.2	-

5.0 REPORT LIMITATIONS

Golder Associates Ltd. (Golder) has not conducted the surface water quality field monitoring, and the scope of work conducted strictly lies within the interpretation and characterization of data obtained by the third-party consultants. Surface water quality monitoring is currently being undertaken by McCallum Environmental Limited (McCallum). Golder understands that McCallum has completed the surface water quality monitoring in a manner consistent with industry standards and a standard of work consistent with those expected from professional consulting services. Golder assumes no responsibility for the quality, reliability, and/or representativeness of the data presented in this report and has interpreted the data provided on the basis that it is reliable, and representative of the locations described by McCallum.

6.0 CLOSURE

We trust that this report meets your current requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

7.0 REFERENCES

McCallum, 2019. Current and Proposed Standard Operating Procedures (SOP). Surface Water (Quality and Quantity). Fifteen Mile Stream Project.

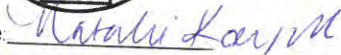
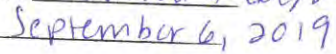
Signature Page

Golder Associates Ltd.



Bret Timmis, M.Sc.
Environmental Specialist



Signature: 
Date: 
Natalie Korczak, M.Sc., P.Geo.
Geochemist

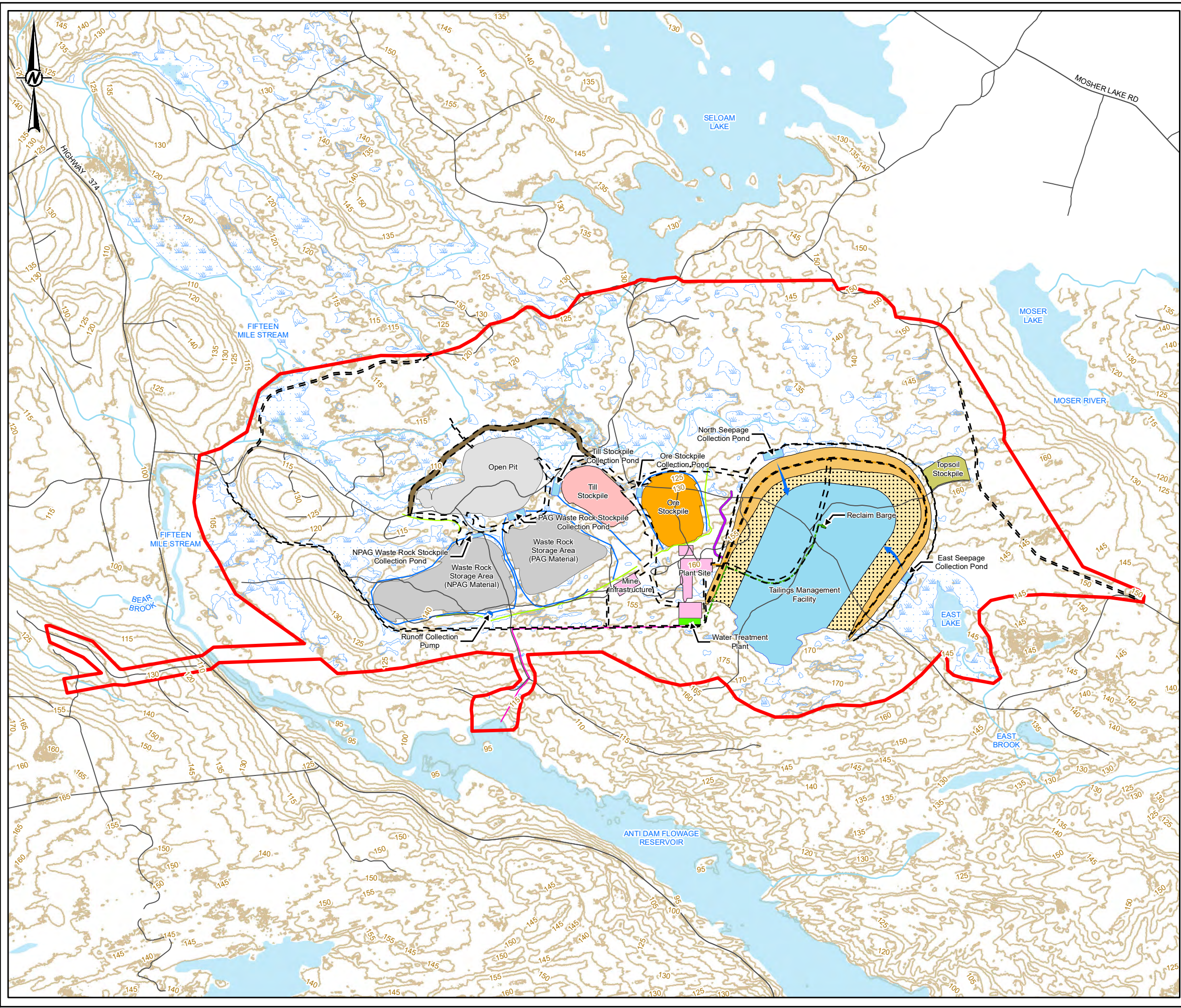


David Brown, M.Sc.
Principal

SD/BT/MG/DB/sb/mc/sm

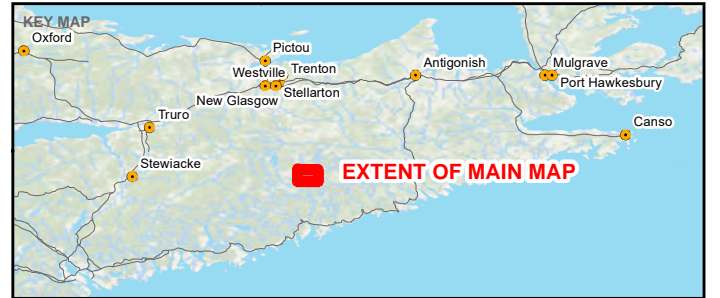
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- LEGEND**
- Fifteen Mile Stream Study Area
 - Existing Road
 - Topographic Contour (5m Interval)
 - - - Access Road
 - Watercourse
 - Wetland
 - Waterbody

- PROPOSED SITE INFRASTRUCTURE**
- Diversion Dam
 - Embankment
 - Laydown
 - Open Pit
 - Ore Stockpile
 - Plant Site
 - Pond; Collection Ponds
 - Reclaim Barge
 - Runoff Collection Sump
 - Spillway Outlet Channel
 - Tailings
 - Till Stockpile
 - Topsoil Stockpile
 - Waste Rock Storage Area
 - Water Treatment Plant
 - Tailings Pipeline
 - Collection Ditch
 - Reclaim Pipeline
 - Non-Contact Water Ditch
 - Water Treatment Pipeline



NOTE(S)
 1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
 1. MCCALLUM ENVIRONMENTAL LTD. EIS PROJECT AREA, (VER.190313, RECEIVED 2019-03-18).
 2. MCCALLUM ENVIRONMENTAL LTD. PROPOSED INFRASTRUCTURE, (VER.190620, RECEIVED 2019-06-28).

PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
 COORDINATE SYSTEM: UTM ZONE 20 VERTICAL DATUM: CGVD28

CLIENT
ATLANTIC MINING NS CORP

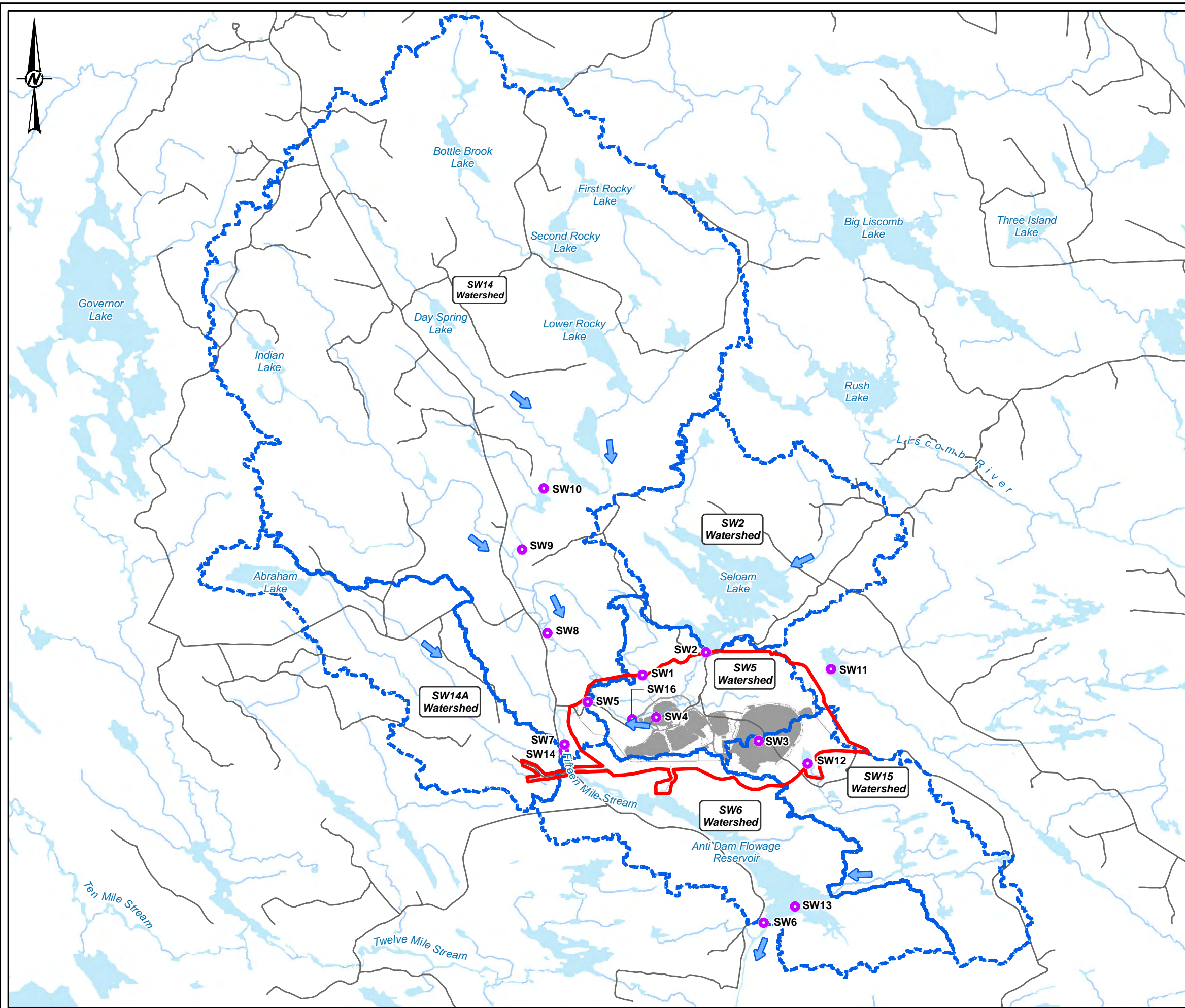
PROJECT
**HYDROLOGICAL BASELINE REPORT
 FIFTEEN MILE STREAM GOLD PROJECT**

TITLE
SITE MAP

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	DESIGNED	—
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	REVIEWED	SK
	APPROVED	SK

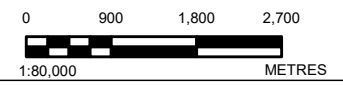
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LEGEND

- Surface Water Flow Direction
- Surface Water Quality Monitoring Stations
- Roads
- Watercourse
- Waterbody
- Watersheds
- Proposed Infrastructure
- Fifteen Mile Stream Study Area



NOTE(S)
 1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
 1. MCCALLUM ENVIRONMENTAL LTD. EIS PROJECT AREA, (VER.190313, RECEIVED 2019-03-18).
 2. MCCALLUM ENVIRONMENTAL LTD. PROPOSED INFRASTRUCTURE, (VER.190620, RECEIVED 2019-06-28).
 PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
 COORDINATE SYSTEM: UTM ZONE 20 VERTICAL DATUM: CGVD28

CLIENT
 ATLANTIC MINING NS CORP

PROJECT
 SURFACE WATER QUALITY BASELINE REPORT
 FIFTEEN MILE STREAM GOLD PROJECT

TITLE
SURFACE WATER QUALITY STATIONS

CONSULTANT	YYYY-MM-DD	2019-09-04
	DESIGNED	—
	PREPARED	RRD
	REVIEWED	NK
	APPROVED	SK

PROJECT NO. 1895674 CONTROL 0003 REV. 2 FIGURE 2

PATH:\A\CLIENT\ATLANTIC GOLD\FifteenMileStream_Coastal\1895674_0003_CH-0002.mxd PRINTED ON: 2019-09-04 AT: 9:45:46 PM
 IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

APPENDIX A

Surface Water Quality Results

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-1									SW-2								
				11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																					
Temperature	°C	-	-	20	15	1.1	1.6	11	14	3.5	0.0	7.9	24	18	1.8	4.8	17	19	1.5	4.2	12.9
pH	pH	6.5 - 9.0	-	4.9	5.3	7.1	5.6	4.0	4.3	4.9	4.9	5.1	5.4	5.8	7.4	5.5	4.4	4.9	5.3	5.2	5.4
Conductivity	µS/cm	-	-	0.0030	0.0020	0.015	0.028	0.018	0.032	0.016	0.011	0.016	0.0010	0.0010	0.011	0.024	0.098	0.020	0.013	0.013	0.015
Total Dissolved Solids	g/L	-	-	0.020	0.020	0.020	0.018	-	0.021	-	-	-	0.010	0.010	0.010	0.016	-	0.013	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	1.4	1.3	0.6	1.1	-	-	-	-	-	1.5	0.90	0.75	1.33
Dissolved Oxygen	mg/L	-	-	8.5	7.9	12	13	7.1	5.6	8.0	12.2	9.0	8.2	8.3	13	14	9.1	9.1	13	14	11
General Chemistry																					
Acidity	mg/L	-	-	-	-	-	-	-	-	6.8	8.6	11.0	-	-	-	-	-	-	<5	6.8	<5
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	5.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	5.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	3.5	4.7	3.7	3.4	2.9	5.0	3.2	2.2	3.1	2.2	2.2	2.8	3.0	2.7	2.6	2.8	2.6	2.3
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	34	30	20	44	-	-	-	-	-	12	<20	<20	<20
Dissolved Chloride (Cl ⁻)	mg/L	120	-	3.1	4.8	3.7	5.2	3.6	4.8	3.8	3.0	2.9	2.6	3.7	2.5	4.9	3.7	4.0	4.2	4.0	3.9
Colour	TCU	-	-	120	110	63	44	75	87	93	47	120	36	17	30	23	25	17	43	36	31
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	22	23	-	-	-	-	-	-	29	19	19
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	<0.05	<0.05	0.081	0.054	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (NO ₂ ⁻)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃ ⁻) ⁴	mg/L as N	3.0	-	<0.05	<0.05	0.081	0.054	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	<sup>5	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.054	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	13	11	5	14	-	-	-	-	-	4.1	6.2	5.5	5.2
Total Organic Carbon (C)	mg/L	-	-	11	14	7.7	6.3	8.3	13	12	5	13	4.3	4.1	5.1	4.7	4.9	4.2	6.1	5.4	5.3
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.01
pH	pH	6.5 - 9.0	-	5.6	5.8	4.9	5.3	6.0	5.9	5.8	6.1	5.3	6.1	5.3	6.0	5.6	6.2	6.4	5.9	6.0	6.3
Total Phosphorus	mg/L	-	-	-	-	-	-	-	-	0.025	<0.02	0.021	-	-	-	-	-	-	<0.02	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	2.4	6.1	4.6	3.0	3.1	7.4	3.2	2.6	3.2	1.2	0.78	2.2	2.0	0.56	0.59	1.7	1.6	1.1
Total Dissolved Solids ²	mg/L	-	-	10	16	13	13	14	18	11	9	10	7.0	8.0	8.0	11	8.0	8.0	10	9	8
Total Suspended Solids	mg/L	-	-	-	-	-	-	-	<2.5	<1.3	<1	2.6	-	-	-	-	-	2.0	1.8	<1	1.8
Dissolved Sulphate (SO ₄)	mg/L	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Turbidity	NTU	-	-	0.40	0.38	0.34	0.50	0.46	1.1	0.23	0.24	1.60	1.3	1.9	0.62	0.86	2.3	1.3	0.61	0.63	1.10
Conductivity	mS/cm	-	-	21	25	35	26	26	28	25	19	20	16	17	22	23	22	20	22	22	18



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-1									SW-2								
				Chronic	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19
Total Metals																					
Total Aluminum (Al)	mg/L	0.10 - 0.0050 ³	0.0050	0.30	0.33	0.20	0.20	0.17	0.23	0.24	0.13	0.30	0.13	0.14	0.13	0.14	0.12	0.069	0.15	0.16	0.14
Total Antimony (Sb)	mg/L	-	0.020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Arsenic (As)	mg/L	0.0050	0.0050	0.0034	0.0031	0.0016	0.0014	0.0024	0.0028	<0.001	<0.001	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Barium (Ba)	mg/L	-	1.0	0.0048	0.0061	0.0049	0.0066	0.0036	0.0056	0.0041	0.0023	0.0049	0.0032	0.0028	0.0031	0.0037	0.0035	0.0028	0.0033	0.0038	0.0032
Total Beryllium (Be)	mg/L	-	0.0053	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Bismuth (Bi)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron (B)	mg/L	1.5	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	mg/L	0.000040 ⁴	0.000018 ⁵	0.000016	0.000018	0.000017	0.000017	0.000015	0.000020	0.000014	0.000019	0.000023	0.000012	0.000012	<0.00001	0.000019	0.000012	0.000011	0.000014	0.000019	0.000016
Total Calcium (Ca)	mg/L	-	-	0.84	1.1	0.77	0.73	0.66	1.2	0.69	0.47	0.71	0.46	0.43	0.56	0.58	0.53	0.49	0.58	0.52	0.44
Total Chromium (Cr)	mg/L	0.0089 ⁵	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Total Cobalt (Co)	mg/L	-	0.010	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Total Copper (Cu)	mg/L	0.0020 ⁴	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0085	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005
Total Iron (Fe)	mg/L	0.30	0.30	0.33	0.38	0.17	0.17	0.18	0.30	0.17	0.10	0.35	0.14	0.23	0.14	0.10	0.097	0.16	0.15	0.15	0.11
Total Lead (Pb)	mg/L	0.0010 ⁴	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0065	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Magnesium (Mg)	mg/L	-	-	0.34	0.45	0.42	0.39	0.31	0.51	0.34	0.24	0.32	0.25	0.27	0.34	0.37	0.32	0.32	0.34	0.32	0.29
Total Manganese (Mn)	mg/L	-	0.82	0.052	0.056	0.057	0.035	0.035	0.11	0.031	0.032	0.044	0.046	0.098	0.029	0.036	0.047	0.024	0.037	0.051	0.038
Total Molybdenum (Mo)	mg/L	0.073	0.073	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Nickel (Ni)	mg/L	0.025 ⁴	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Phosphorus (P)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Potassium (K)	mg/L	-	-	0.22	0.32	0.41	0.47	0.25	0.34	0.21	0.28	0.25	0.23	0.23	0.29	0.30	0.28	0.24	0.28	0.25	0.25
Total Selenium (Se)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Silver (Ag)	mg/L	0.00025	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Sodium (Na)	mg/L	-	-	2.3	2.7	2.4	2.4	2.4	3.1	2.4	1.8	2.1	1.8	2.0	2.2	2.4	2.3	2.4	2.3	2.3	2.3
Total Strontium (Sr)	mg/L	-	21	0.0078	0.010	0.0078	0.0068	0.0067	0.011	0.0074	0.0046	0.0066	0.0052	0.0041	0.0058	0.0064	0.0059	0.0050	0.0062	0.0056	0.0051
Total Thallium (Tl)	mg/L	0.00080	0.00080	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium (Ti)	mg/L	-	-	0.0033	0.0040	0.0023	0.0028	0.0021	0.0038	0.0034	<0.002	0.0035	<0.002	0.0029	0.0023	<0.002	<0.002	<0.002	0.0064	<0.002	<0.002
Total Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Total Uranium (U)	mg/L	0.015	0.30	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium (V)	mg/L	-	0.0060	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Zinc (Zn)	mg/L	-	0.030	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0071	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Metals																					
Dissolved Aluminum (Al)	mg/L	-	-	-	-	-	-	-	0.22	0.24	0.13	0.28	-	-	-	-	-	0.045	0.15	0.14	0.12
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	-	0.0028	<0.001	<0.001	0.0015	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	-	0.0055	0.0041	0.0025	0.0042	-	-	-	-	-	0.0028	0.0037	0.0035	0.0035
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
Dissolved Cadmium (Cd)	mg/L	-	-	-	-	-	-	-	0.000030	0.000017	<0.00001	0.000015	-	-	-	-	-	0.000015	0.000018	0.000018	0.000018
Dissolved Calcium (Ca)	mg/L	-	-	-	-	-	-	-	1.2	0.74	0.51	0.67	-	-	-	-	-	0.49	0.58	0.54	0.47
Dissolved Chromium (Cr)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	0.001	<0.001	-	-	-	-	-	<0.001	0.0052	<0.001	<0.001
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	-	0.00045	<0.0004	<0.0004	<0.0004	-	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004
Dissolved Copper (Cu)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005	-	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L	-	-	-	-	-	-	-	0.29	0.48	0.09	0.24	-	-	-	-	-	<0.05	0.11	0.11	0.07
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L	-	-	-	-	-	-	-	0.50	0.45	0.23	0.32	-	-	-	-	-	0.32	0.36	0.32	0.28
Dissolved Manganese (Mn)	mg/L	-	-	-	-	-	-	-	0.12	0.056	0.028	0.027	-	-	-	-	-	0.021	0.036	0.050	0.038
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	-	<0.												

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-3								SW-4								
				11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																				
Temperature	°C	-	-	26	18	3.3	3.9	14	3.6	-	11.9	18	18	2.6	4.4	13	17	3.5	0.6	8.7
pH	pH	6.5 - 9.0	-	5.3	5.9	6.1	4.8	5.3	5.3	-	5.4	5.4	5.6	7.6	5.6	5.2	5.7	5.9	5.8	5.4
Conductivity	µS/cm	-	-	0.0020	0.0020	0.013	0.027	0.017	0.015	-	0.021	0.0060	0.0050	0.024	0.024	0.030	0.059	0.017	0.014	0.019
Total Dissolved Solids	g/L	-	-	0.010	0.010	0.010	0.020	-	-	-	-	0.040	0.030	0.030	0.023	-	0.039	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	1.5	-	0.5	-	-	-	-	11	3.1	1.2	0.8	-
Dissolved Oxygen	mg/L	-	-	9.1	8.7	9.6	9.7	8.5	7.8	-	8.9	6.1	7.1	13	11	6.5	4.2	9.9	12.1	9.0
General Chemistry																				
Acidity	mg/L	-	-	-	-	-	-	-	<5	-	<5	-	-	-	-	-	-	<5	10	8.8
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	<5	<5	-	<5	9.6	<5	7.4	5.4	12	22	<5	5.3	5.2
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	-	<1	9.6	<1	7.4	5.4	12	15	<1	5.3	5.2
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	2.4	2.4	2.9	3.1	2.9	1.5	-	2.3	9.0	14	9.8	7.2	10	16	6.4	5.6	5.9
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	<20	-	<20	-	-	-	-	-	38	<20	<20	27
Dissolved Chloride (Cl)	mg/L	120	-	2.1	3.3	3.7	5.0	3.7	2.8	-	4.1	3.3	4.7	3.8	5.6	3.7	4.3	3.5	3.5	2.7
Colour	TCU	-	-	7.9	15	<25	<25	9.8	<5	-	5.9	62	19	45	24	33	61	52	23	53
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	12	-	12	-	-	-	-	-	-	-	21	38
Dissolved Fluoride (F)	mg/L	0.12	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	0.054	0.065	0.081	0.10	<0.05	<0.05	0.058	0.059	0.072
Nitrite (NO ₂)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃) ⁴	mg/L as N	3.0	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	0.054	0.065	0.081	0.10	<0.05	0.097	0.058	0.059	0.072
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	0.055	0.054	0.12	<0.05	0.052	0.14	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	1.3	-	2.4	-	-	-	-	-	6.4	7.6	3.8	9.3
Total Organic Carbon (C)	mg/L	-	-	2.7	3.4	1.8	2.6	3.2	1.3	-	1.9	7.6	6.7	5.2	4.2	6.3	8.9	7.3	3.7	8.7
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	0.034	0.016	0.017	<0.01	0.022	0.029	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	6.0	5.9	5.7	6.0	6.1	6.4	-	6.2	6.6	4.3	6.2	6.4	6.6	7.0	5.9	6.4	5.9
Total Phosphorus	mg/L	-	-	-	-	-	-	-	0.024	-	<0.02	-	-	-	-	-	-	0.031	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	1.5	2.0	3.9	3.6	1.7	1.6	-	1.8	3.4	4.4	4.8	3.2	2.9	6.5	3.2	3.0	3.2
Total Dissolved Solids ⁴	mg/L	-	-	6.0	8.0	14	13	9.0	6.0	-	9.0	21	40	26	19	23	35	12	15	17
Total Suspended Solids	mg/L	-	-	-	-	-	-	-	<1.3	-	<1	-	-	-	-	-	18	1.8	<1	<1
Dissolved Sulphate (SO ₄)	mg/L	-	-	<2	<2	2.3	<2	<2	<2	-	<2	<2	19	3.5	<2	<2	<2	<2	<2	2.4
Turbidity	NTU	-	-	0.84	0.65	0.22	0.75	1.4	0.24	-	0.49	2.6	6.3	3.8	0.96	1.9	9.3	2.5	0.9	0.9
Conductivity	mS/cm	-	-	15	16	26	24	22	16	-	19	32	86	44	34	39	59	27	26	24



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-3								SW-4								
				Chronic	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19
Total Metals																				
Total Aluminum (Al)	mg/L	0.10 - 0.0050 ³	0.0050	0.047	0.071	0.058	0.049	0.042	0.084	-	0.032	0.19	0.18	0.18	0.14	0.12	0.26	0.26	0.13	0.28
Total Antimony (Sb)	mg/L	-	0.020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Arsenic (As)	mg/L	0.0050	0.0050	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	0.20	0.19	0.13	0.035	0.14	0.34	0.032	0.027	0.027
Total Barium (Ba)	mg/L	-	1.0	0.0052	0.0041	0.0048	0.0059	0.0055	0.0023	-	0.0045	0.0050	0.0062	0.0047	0.0027	0.0056	0.011	0.0033	0.0025	0.0028
Total Beryllium (Be)	mg/L	-	0.0053	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Bismuth (Bi)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron (B)	mg/L	1.5	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	mg/L	0.000040 ⁴	- ⁶	<0.00001	<0.00001	0.000013	0.000012	<0.00001	<0.00001	-	<0.00001	0.000014	0.000017	0.000020	0.000019	0.000011	0.000011	0.000011	0.000017	0.000019
Total Calcium (Ca)	mg/L	-	-	0.59	0.58	0.66	0.65	0.64	0.32	-	0.50	2.9	4.7	3.1	2.2	3.4	7.3	1.9	1.7	1.8
Total Chromium (Cr)	mg/L	0.0089 ⁵	-	<0.001	<0.001	0.0021	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001
Total Cobalt (Co)	mg/L	-	0.010	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	-	<0.0004	0.0018	0.0016	0.0012	0.00058	0.0011	0.0058	<0.0004	0.00046	<0.0004
Total Copper (Cu)	mg/L	0.0020 ⁴	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0039	0.0017
Total Iron (Fe)	mg/L	0.30	0.30	0.054	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	1.9	2.2	1.8	0.41	1.7	4.8	0.047	0.36	0.32
Total Lead (Pb)	mg/L	0.0010 ⁴	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.0005	0.00091	0.00089	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.0005	<0.0005
Total Magnesium (Mg)	mg/L	-	-	0.23	0.22	0.31	0.34	0.31	0.17	-	0.25	0.39	0.60	0.50	0.43	0.45	0.81	0.40	0.32	0.34
Total Manganese (Mn)	mg/L	-	0.82	0.014	0.018	0.016	0.0083	0.012	0.018	-	0.017	0.49	0.53	0.36	0.15	0.35	1.5	0.093	0.140	0.075
Total Molybdenum (Mo)	mg/L	0.073	0.073	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Nickel (Ni)	mg/L	0.025 ⁴	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Phosphorus (P)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Potassium (K)	mg/L	-	-	0.13	0.23	0.38	0.55	0.15	<0.1	-	0.13	0.37	0.62	0.40	0.39	0.44	0.69	0.23	0.29	0.26
Total Selenium (Se)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Silver (Ag)	mg/L	0.00025	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Sodium (Na)	mg/L	-	-	1.8	1.9	2.8	2.5	2.3	1.3	-	2.5	2.3	2.9	2.6	2.7	2.7	3.4	2.4	2.1	2.2
Total Strontium (Sr)	mg/L	-	21	0.0073	0.0064	0.0066	0.0073	0.0085	0.0029	-	0.0068	0.011	0.018	0.012	0.0084	0.012	0.023	0.0076	0.0064	0.0070
Total Thallium (Tl)	mg/L	0.00080	0.00080	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium (Ti)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	0.0042	0.0023	<0.002	<0.002	0.0090	<0.002	<0.002	<0.002
Total Tungsten (W)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Total Uranium (U)	mg/L	0.015	0.30	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium (V)	mg/L	-	0.0060	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Zinc (Zn)	mg/L	-	0.030	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	0.0082	<0.005	<0.005	<0.005
Total Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	<0.002	-	<0.002	-	-	-	-	-	-	<0.002	<0.002	<0.002
Dissolved Metals																				
Dissolved Aluminum (Al)	mg/L	-	-	-	-	-	-	-	0.066	-	0.032	-	-	-	-	-	0.060	0.23	0.11	0.26
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	0.079	0.019	0.018	0.021
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	-	0.0018	-	0.0044	-	-	-	-	-	0.0057	0.0026	0.0022	0.0026
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	<0.002	-	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	-	<0.05	-	<0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
Dissolved Cadmium (Cd)	mg/L	-	-	-	-	-	-	-	<0.00001	-	0.000012	-	-	-	-	-	0.000020	0.000019	0.000016	0.000015
Dissolved Calcium (Ca)	mg/L	-	-	-	-	-	-	-	0.26	-	0.50	-	-	-	-	-	5.4	1.9	1.6	1.8
Dissolved Chromium (Cr)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	-	<0.0004	-	<0.0004	-	-	-	-	-	0.0014	0.00042	<0.0004	<0.0004
Dissolved Copper (Cu)	mg/L	-	-	-	-	-	-	-	<0.002	-	<0.0005	-	-	-	-	-	<0.002	<0.002	0.00063	0.0012
Dissolved Iron (Fe)	mg/L	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	0.71	0.38	0.24	0.23
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	-	<0.0005	-	<0.0005	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L	-	-	-	-	-	-	-	0.15	-	0.24	-	-	-	-	-	0.66	0.42	0.33	0.34
Dissolved Manganese (Mn)	mg/L	-	-	-	-	-	-	-	0.016	-	0.020	-	-	-	-	-	0.55	0.097	0.110	0.071
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	-	<0.002	-	0.004	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	-	<0.002	-	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Phosphorus (P)	mg/L	-	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L	-	-	-	-	-	-	-	<0.1	-	0.15	-	-	-	-	-	0.62	0.23	0.29	0.24
Dissolved Selenium (Se)	mg/L	-	-	-	-	-	-	-	<0.001	-	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Silver (Ag)	mg/L	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium (Na)	mg/L	-	-	-	-	-	-	-	1.1	-	2.4	-	-	-	-	-	3.1</			

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-5									SW-6								
				11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																					
Temperature	°C	-	-	21	18	0.90	3.1	15	14	3.0	0.5	11.8	23	18	1.4	4.4	15	17	1.0	1.4	11.8
pH	pH	6.5 - 9.0	-	4.7	5.7	6.8	5.3	4.9	4.9	5.3	5.2	5.6	5.6	5.2	5.9	5.7	4.6	4.7	4.2	5.1	5.3
Conductivity	µS/cm	-	-	0.0010	0.0020	0.012	0.026	0.017	0.022	0.014	0.011	0.016	0.0030	0.0020	0.016	0.032	0.019	0.027	0.016	0.014	0.018
Total Dissolved Solids	g/L	-	-	0.010	0.010	0.010	0.016	-	0.017	-	-	-	0.020	0.020	0.020	0.021	-	0.017	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	0	3.3	1.0	1.0	-	-	-	-	-	9.4	0.92	1.80	0.83
Dissolved Oxygen	mg/L	-	-	8.5	8.0	13	14	9.2	9.8	12	16	10	8.0	8.1	14	14	9.7	9.0	14	16	12
General Chemistry																					
Acidity	mg/L	-	-	-	-	-	-	-	-	<5	<5	<5	-	-	-	-	-	-	5.8	5.2	<5
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	2.8	3.6	3.0	3.2	3.0	3.1	3.5	2.7	3.0	3.1	4.0	4.0	3.9	3.1	3.4	3.3	2.7	2.6
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	20	<20	<20	24	-	-	-	-	-	26	21	20	<20
Dissolved Chloride (Cl ⁻)	mg/L	120	-	3.0	4.2	3.4	5.1	3.4	4.2	4.4	3.5	3.0	3.8	5.0	4.8	6.7	4.0	5.4	4.9	4.8	4.4
Colour	TCU	-	-	74	44	41	32	36	29	60	43	54	87	61	83	32	63	59	81	47	50
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	22	12	24	-	-	-	-	-	-	21	36	25
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.063	<0.05
Nitrite (NO ₂ ⁻)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃ ⁻) ⁴	mg/L as N	3.0	-	0.058	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.063	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	4.0	7.4	5.4	8.3	-	-	-	-	-	6.0	9.3	6.0	7.3
Total Organic Carbon (C)	mg/L	-	-	6.1	6.0	6.1	5.0	5.7	4.8	-	5.3	7.6	7.5	9.8	10	5.3	7.5	7.4	9.5	5.9	7.4
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	0.013	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	5.9	5.4	5.2	5.6	6.1	6.2	5.9	6.5	5.9	5.9	5.3	5.9	5.8	6.2	6.3	5.6	6.5	6.0
Total Phosphorus	mg/L	-	-	-	-	-	-	-	-	0.022	<0.02	<0.02	-	-	-	-	-	-	0.024	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	1.6	2.1	2.7	1.9	<0.5	1.4	2.7	1.7	1.6	1.6	2.6	3.3	2.4	1.1	1.6	3.0	2.3	1.7
Total Dissolved Solids ²	mg/L	-	-	9.0	11	10	11	7.0	10	11	9	9	9.0	13	13	14	9.0	13	12	15	10
Total Suspended Solids	mg/L	-	-	-	-	-	-	-	1.8	<1.3	1	1.8	-	-	-	-	-	14	<1.3	1	1.6
Dissolved Sulphate (SO ₄)	mg/L	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	3.7	<2
Turbidity	NTU	-	-	0.97	3.7	0.54	0.49	1.3	0.82	3.1	0.6	1.3	0.68	2.9	0.95	0.70	1.6	7.0	0.84	1.30	0.76
Conductivity	mS/cm	-	-	17	20	22	24	22	21	23	20	18	21	26	30	32	28	25	27	26	21



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-5								SW-6									
				Chronic	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19
Total Metals																					
Total Aluminum (Al)	mg/L	0.10 - 0.0050 ³	0.0050	0.18	0.24	0.16	0.14	0.13	0.087	0.32	0.15	0.20	0.22	0.25	0.30	0.17	0.20	0.28	0.24	0.17	0.19
Total Antimony (Sb)	mg/L	-	0.020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Arsenic (As)	mg/L	0.0050	0.0050	0.037	0.049	0.0047	0.0034	0.025	0.077	0.013	0.004	0.014	0.0048	0.0045	0.0013	0.0011	0.0030	0.021	0.0014	<0.001	0.0019
Total Barium (Ba)	mg/L	-	1.0	0.0035	0.0037	0.0030	0.0034	0.0033	0.0024	0.0038	0.0029	0.0035	0.0042	0.0048	0.0062	0.0053	0.0046	0.0039	0.0049	0.0037	0.0040
Total Beryllium (Be)	mg/L	-	0.0053	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Bismuth (Bi)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron (B)	mg/L	1.5	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	mg/L	0.000040 ⁴	- ⁶	0.000013	<0.00001	0.000014	0.000014	<0.00001	0.000020	0.000012	0.000010	0.000016	0.000014	0.000011	0.000026	0.000022	0.000015	0.000014	0.000020	0.000017	0.000018
Total Calcium (Ca)	mg/L	-	-	0.67	0.86	0.63	0.69	0.67	0.66	0.81	0.56	0.69	0.72	0.89	0.87	0.83	0.68	0.75	0.73	0.59	0.57
Total Chromium (Cr)	mg/L	0.0089 ⁵	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt (Co)	mg/L	-	0.010	0.00045	0.00051	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Total Copper (Cu)	mg/L	0.0020 ⁴	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	0.00053	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005
Total Iron (Fe)	mg/L	0.30	0.30	0.59	0.89	0.18	0.13	0.34	0.61	0.36	0.17	0.28	0.33	0.58	0.31	0.15	0.25	1.3	0.28	0.17	0.19
Total Lead (Pb)	mg/L	0.0010 ⁴	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00075	<0.0005	<0.0005	<0.0005
Total Magnesium (Mg)	mg/L	-	-	0.28	0.35	0.34	0.36	0.32	0.35	0.36	0.31	0.31	0.31	0.42	0.45	0.44	0.33	0.37	0.35	0.29	0.29
Total Manganese (Mn)	mg/L	-	0.82	0.11	0.11	0.055	0.041	0.077	0.082	0.055	0.058	0.070	0.072	0.057	0.079	0.066	0.061	0.068	0.058	0.066	0.054
Total Molybdenum (Mo)	mg/L	0.073	0.073	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Nickel (Ni)	mg/L	0.025 ⁴	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Phosphorus (P)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Potassium (K)	mg/L	-	-	0.23	0.40	0.29	0.33	0.27	0.20	0.26	0.29	0.24	0.28	0.26	0.30	0.33	0.32	0.26	0.20	0.26	0.29
Total Selenium (Se)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Silver (Ag)	mg/L	0.00025	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Sodium (Na)	mg/L	-	-	1.9	2.2	2.3	2.4	2.3	2.6	2.3	2.1	2.1	2.4	3.1	2.7	3.4	2.7	3.4	2.7	2.8	2.8
Total Strontium (Sr)	mg/L	-	21	0.0063	0.0066	0.0056	0.0057	0.0061	0.0057	0.0064	0.0050	0.0057	0.0061	0.0078	0.0079	0.0065	0.0056	0.0061	0.0065	0.0047	0.0048
Total Thallium (Tl)	mg/L	0.00080	0.00080	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium (Ti)	mg/L	-	-	0.0020	0.0044	0.0022	<0.002	<0.002	<0.002	0.0042	<0.002	0.0023	<0.002	0.0052	0.0028	<0.002	0.0026	0.011	0.0023	0.0024	<0.002
Total Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Total Uranium (U)	mg/L	0.015	0.30	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium (V)	mg/L	-	0.0060	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Zinc (Zn)	mg/L	-	0.030	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Metals																					
Dissolved Aluminum (Al)	mg/L	-	-	-	-	-	-	-	0.058	0.45	0.13	0.19	-	-	-	-	-	0.095	0.23	0.14	0.17
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	-	0.057	0.0071	0.0030	0.0130	-	-	-	-	-	0.0076	0.0012	<0.001	0.0017
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	-	0.0022	0.0037	0.0027	0.0035	-	-	-	-	-	0.0030	0.0050	0.0038	0.0041
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
Dissolved Cadmium (Cd)	mg/L	-	-	-	-	-	-	-	<0.00001	0.000027	0.000011	0.000018	-	-	-	-	-	<0.00001	0.000023	0.000017	0.000017
Dissolved Calcium (Ca)	mg/L	-	-	-	-	-	-	-	0.53	1.1	0.58	0.69	-	-	-	-	-	0.72	0.73	0.67	0.59
Dissolved Chromium (Cr)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	0.001	0.001	-	-	-	-	-	<0.001	<0.001	<0.001	0.001
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	-	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004
Dissolved Copper (Cu)	mg/L	-	-	-	-	-	-	-	<0.002	0.0062	<0.0005	<0.0005	-	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L	-	-	-	-	-	-	-	0.29	0.20	0.13	0.22	-	-	-	-	-	0.36	0.25	0.13	0.13
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L	-	-	-	-	-	-	-	0.32	0.37	0.29	0.30	-	-	-	-	-	0.34	0.38	0.29	0.29
Dissolved Manganese (Mn)	mg/L	-	-	-	-	-	-	-	0.066	0.053	0.057	0.067	-	-	-	-	-	0.057	0.059	0.064	0.050
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002										

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-7								SW-8									
				Chronic	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	11-Jul-17	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19
Field Parameters																					
Temperature	°C	-	-	20	14	0.50	4.1	12	14	3.5	0.1	10.3	21	16	0.30	4.4	15	15	1.9	3.3	13.5
pH	pH	6.5 - 9.0	-	5.3	5.3	6.4	4.2	4.9	4.3	5.0	5.1	5.3	4.8	6.3	6.2	4.9	4.5	5.2	4.9	5.3	5.5
Conductivity	µS/cm	-	-	0.0040	0.0030	0.014	0.028	0.017	0.034	0.014	0.011	0.019	0.0030	0.0020	0.014	0.036	0.020	0.032	0.017	0.014	0.018
Total Dissolved Solids	g/L	-	-	0.020	0.020	0.020	0.018	-	0.022	-	-	-	0.020	0.010	0.020	0.023	-	0.021	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	0.61	1.3	0.57	0.42	-	-	-	-	-	0.40	0.91	1.3	2.2
Dissolved Oxygen	mg/L	-	-	6.3	6.7	12	11	6.2	6.6	10	12	10	9.0	9.5	14	15	9.6	8.8	13	14	11
General Chemistry																					
Acidity	mg/L	-	-	-	-	-	-	-	-	8.6	8.0	7.2	-	-	-	-	-	-	5.2	<5	<5
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	3.7	5.0	4.0	3.4	3.2	5.8	3.3	2.3	2.8	2.8	3.4	3.7	3.9	3.2	4.1	3.6	2.7	2.8
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	-	27	21	<20	32	-	-	-	-	-	15	25	20	22
Dissolved Chloride (Cl ⁻)	mg/L	120	-	3.1	4.9	4.4	4.9	2.6	5.9	3.7	2.8	3.2	3.4	4.8	4.4	7.3	4.6	5.2	5.2	4.4	3.6
Colour	TCU	-	-	41	37	26	16	25	31	59	32	43	49	44	60	35	42	26	80	42	59
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	14	22	-	-	-	-	-	-	-	22	33
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	<0.05	<0.05	<0.05	0.061	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.052	<0.05
Nitrite (NO ₂ ⁻)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃ ⁻) ⁴	mg/L as N	3.0	-	<0.05	<0.05	<0.05	0.061	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.052	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	-	7.1	8.4	5.0	7.6	-	-	-	-	-	4.4	9.6	5.9	8.5
Total Organic Carbon (C)	mg/L	-	-	8.1	7.7	5.9	4.6	6.3	7.1	8.1	5.0	7.9	6.2	8.3	8.0	5.6	6.5	5.7	9.3	5.8	8.1
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	5.9	5.8	5.5	5.3	6.1	6.0	5.4	6.1	5.7	6.3	5.5	5.8	5.9	6.3	6.4	5.5	5.8	5.3
Total Phosphorus	mg/L	-	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	-	-	-	-	-	-	0.023	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	2.3	3.8	3.9	2.5	1.3	3.7	2.9	2.6	2.2	1.3	1.9	3.2	2.6	<0.5	0.91	3.3	2.4	1.9
Total Dissolved Solids ²	mg/L	-	-	10	14	15	12	8.0	16	10	9	9	8.0	11	12	15	9.0	12	13	11	9
Total Suspended Solids	mg/L	-	-	-	-	-	-	-	<2.5	<1.3	<1	1	-	-	-	-	-	11	1.0	2.0	2.4
Dissolved Sulphate (SO ₄)	mg/L	-	-	<2	<2	2.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Turbidity	NTU	-	-	0.39	0.86	0.23	0.25	2.2	1.7	0.67	0.40	0.46	0.59	0.63	0.53	0.70	0.68	0.50	0.50	0.64	1.20
Conductivity	mS/cm	-	-	20	25	30	27	22	31	22	19	17	20	24	26	33	26	27	27	23	20



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-9								SW-10							
				13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																			
Temperature	°C	-	-	16	0.50	4.9	16	18	1.8	3.2	14.6	12	1.3	6.1	14	17	2.7	3.8	15.1
pH	pH	6.5 - 9.0	-	6.1	6.6	4.6	4.8	5.3	5.1	5.2	5.5	6.4	5.9	5.0	4.8	5.1	5.2	5.2	5.6
Conductivity	µS/cm	-	-	0.0020	0.014	0.037	0.021	0.028	0.019	0.015	0.020	0.0040	0.019	0.035	0.030	0.029	0.018	0.015	0.021
Total Dissolved Solids	g/L	-	-	0.010	0.020	0.024	-	0.018	-	-	-	0.020	0.020	0.022	-	0.019	-	-	-
Turbidity	NTU	-	-	-	-	-	-	0.0	0.77	1.5	1.5	-	-	-	-	0	1.4	1.2	1.3
Dissolved Oxygen	mg/L	-	-	9.2	13	14	8.9	9.0	11	14	11	9.7	12	11	8.1	6.6	9.5	11.8	9.8
General Chemistry																			
Acidity	mg/L	-	-	-	-	-	-	-	5.2	<5	<5	-	-	-	-	-	<5	5.4	<5
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	5.1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	5.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	3.0	3.5	4.0	3.1	3.5	3.7	2.9	2.7	4.6	3.5	3.9	3.9	3.1	3.2	2.6	2.3
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	10	21	23	24	-	-	-	-	9.5	<20	20	<20
Dissolved Chloride (Cl ⁻)	mg/L	120	-	4.9	4.8	7.8	4.3	5.2	6.2	4.7	4.1	7.4	4.7	7.1	7.4	5.2	5.7	4.5	4.1
Colour	TCU	-	-	23	48	28	34	18	62	40	36	43	55	26	61	15	64	43	33
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	27	25	-	-	-	-	-	34	22	19
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (NO ₂)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃) ⁴	mg/L as N	3.0	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	3.7	8.6	6.2	5.8	-	-	-	-	4.0	7.7	6.4	5.6
Total Organic Carbon (C)	mg/L	-	-	5.6	7.6	5.1	5.6	3.8	8.9	5.6	5.4	8.8	7.3	5.3	7.8	3.7	7.9	5.7	5.7
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	6.1	5.6	5.7	6.2	6.4	6.1	5.7	6.0	5.7	5.5	5.4	5.8	6.2	5.5	7.1	6.0
Total Phosphorus	mg/L	-	-	-	-	-	-	-	0.023	<0.02	0.023	-	-	-	-	-	0.023	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	1.5	2.8	2.4	0.95	0.58	3.3	2.4	1.5	3.0	2.7	2.7	1.5	0.74	3.2	4.0	1.7
Total Dissolved Solids ⁴	mg/L	-	-	11	12	16	13	11	15	12	10	17	12	16	16	11	13	12	9
Total Suspended Solids	mg/L	-	-	-	-	-	-	<2.5	1.2	2.0	1.6	-	-	-	-	1.8	<1.3	<1	2.2
Dissolved Sulphate (SO ₄)	mg/L	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Turbidity	NTU	-	-	0.87	0.68	0.66	1.1	0.62	0.72	1.60	1.30	0.32	3.1	0.72	0.82	0.69	0.56	0.89	1.50
Conductivity	mS/cm	-	-	24	26	35	27	26	30	24	23	34	27	34	38	24	27	26	20



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-9								SW-10							
				13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Total Metals																			
Total Aluminum (Al)	mg/L	0.10 - 0.0050 ³	0.0050	0.13	0.23	0.20	0.18	0.042	0.27	0.20	0.19	0.17	0.36	0.20	0.21	0.077	0.25	0.21	0.19
Total Antimony (Sb)	mg/L	-	0.020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Arsenic (As)	mg/L	0.0050	0.0050	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001
Total Barium (Ba)	mg/L	-	1.0	0.0048	0.0061	0.0074	0.0057	0.0030	0.0068	0.0054	0.0051	0.0047	0.0073	0.0083	0.0067	0.0039	0.0060	0.0051	0.0050
Total Beryllium (Be)	mg/L	-	0.0053	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Bismuth (Bi)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron (B)	mg/L	1.5	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	mg/L	0.00004 ⁴	- ⁶	<0.00001	0.000019	0.000037	0.000012	<0.00001	0.000025	0.000025	0.000018	<0.00001	0.000029	0.000038	0.000017	<0.00001	0.000024	0.000025	0.000019
Total Calcium (Ca)	mg/L	-	-	0.66	0.74	0.86	0.67	0.73	0.80	0.61	0.57	1.1	0.73	0.80	0.89	0.65	0.68	0.55	0.48
Total Chromium (Cr)	mg/L	0.0089 ⁵	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012
Total Cobalt (Co)	mg/L	-	0.010	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Total Copper (Cu)	mg/L	0.0020 ⁴	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	<0.0005
Total Iron (Fe)	mg/L	0.30	0.30	0.17	0.19	0.10	0.15	0.11	0.21	0.14	0.15	0.34	0.42	0.12	0.22	0.13	0.20	0.14	0.12
Total Lead (Pb)	mg/L	0.0010 ⁴	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00073	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Magnesium (Mg)	mg/L	-	-	0.33	0.41	0.45	0.35	0.42	0.42	0.33	0.30	0.48	0.41	0.45	0.40	0.37	0.37	0.31	0.28
Total Manganese (Mn)	mg/L	-	0.82	0.028	0.049	0.072	0.054	0.041	0.067	0.066	0.076	0.064	0.099	0.069	0.036	0.032	0.053	0.064	0.059
Total Molybdenum (Mo)	mg/L	0.073	0.073	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Nickel (Ni)	mg/L	0.025 ⁴	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Phosphorus (P)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Potassium (K)	mg/L	-	-	0.28	0.29	0.32	0.33	0.24	0.20	0.24	0.26	0.21	0.50	0.84	0.39	0.33	0.22	0.23	0.25
Total Selenium (Se)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Silver (Ag)	mg/L	0.00025	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Sodium (Na)	mg/L	-	-	2.9	2.8	4.1	3.0	3.7	3.6	2.8	2.9	4.5	2.8	4.0	4.7	3.2	2.9	2.6	2.4
Total Strontium (Sr)	mg/L	-	21	0.0055	0.0064	0.0067	0.0056	0.0050	0.0069	0.0046	0.0045	0.0081	0.0057	0.0069	0.0077	0.0054	0.0062	0.0046	0.0041
Total Thallium (Tl)	mg/L	0.00080	0.00080	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium (Ti)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	0.0029	<0.002	<0.002	<0.002	0.0047	<0.002	0.0023	<0.002	<0.002	<0.002	<0.002
Total Tungsten (W)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001
Total Uranium (U)	mg/L	0.015	0.30	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium (V)	mg/L	-	0.0060	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Zinc (Zn)	mg/L	-	0.030	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0068	0.0076	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zirconium (Zr)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Metals																			
Dissolved Aluminum (Al)	mg/L	-	-	-	-	-	-	0.032	0.26	0.18	0.16	-	-	-	-	0.047	0.25	0.18	0.16
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	0.0028	0.0066	0.0052	0.0049	-	-	-	0.0035	0.0063	0.0053	0.0050	0.0050
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Cadmium (Cd)	mg/L	-	-	-	-	-	-	<0.00001	0.000033	0.000026	0.000017	-	-	-	<0.00001	0.000027	0.000023	0.000019	0.000019
Dissolved Calcium (Ca)	mg/L	-	-	-	-	-	-	0.64	0.78	0.62	0.57	-	-	-	0.59	0.69	0.59	0.48	0.48
Dissolved Chromium (Cr)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Dissolved Copper (Cu)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005	-	-	-	<0.002	<0.002	<0.0005	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L	-	-	-	-	-	-	0.066	0.18	0.11	0.09	-	-	-	0.063	0.15	0.12	0.07	0.07
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L	-	-	-	-	-	-	0.38	0.40	0.33	0.30	-	-	-	0.35	0.39	0.32	0.27	0.27
Dissolved Manganese (Mn)	mg/L	-	-	-	-	-	-	0.030	0.064	0.064	0.064	-	-	-	0.025	0.053	0.063	0.054	0.054
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Phosphorus (P)	mg/L	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L	-	-	-	-	-	-	0.22	0.20	0.24	0.27	-	-	-	0.28	0.22	0.23	0.24	0.24
Dissolved Selenium (Se)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Silver (Ag)	mg/L	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-11								SW-12							
				13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	13-Oct-17	20-Dec-17	2-Apr-18	5-Jul-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																			
Temperature	°C	-	-	19	1.2	4.3	16	19	2.0	0.5	13.8	14	1.2	4.2	-	16	1.3	3.0	13.3
pH	pH	6.5 - 9.0	-	5.4	6.5	4.8	4.3	4.5	3.9	4.9	4.8	4.8	5.6	4.7	-	4.7	4.5	4.8	4.9
Conductivity	µS/cm	-	-	0.0020	0.022	0.031	0.019	0.023	0.074	0.010	0.046	0.0020	0.015	0.028	-	0.030	0.019	0.012	0.019
Total Dissolved Solids	g/L	-	-	0.020	0.030	0.020	-	0.015	-	-	-	0.010	0.020	0.018	-	0.019	-	-	-
Turbidity	NTU	-	-	-	-	-	-	0	0.53	1.00	5.14	-	-	-	-	0	0.86	0.37	0.89
Dissolved Oxygen	mg/L	-	-	8.1	13	12	8.7	8.0	11	12	9.1	9.2	16	15	-	6.9	8.1	10.2	9.3
General Chemistry																			
Acidity	mg/L	-	-	-	-	-	-	<5	7.2	5.4	-	-	-	-	-	5.4	9.0	6.2	-
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	3.8	3.8	3.9	2.7	3.1	1.6	1.4	2.0	4.2	3.5	3.3	4.2	5.1	2.5	1.3	2.6
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	-	35	<20	<20	27	-	-	-	-	49	24	<20	37
Dissolved Chloride (Cl ⁻)	mg/L	120	-	4.2	4.9	5.7	3.5	4.5	2.3	2.8	3.6	3.6	3.4	4.8	4.2	4.9	4.7	2.4	3.5
Colour	TCU	-	-	93	130	42	86	110	61	31	91	150	120	46	220	250	100	22	150
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	20	18	16	-	-	-	-	<10	<10	29	-
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (NO ₂)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃) ⁴	mg/L as N	3.0	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	0.075	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	-	10	8.6	5.1	9.4	-	-	-	-	17	9.9	3.3	12.0
Total Organic Carbon (C)	mg/L	-	-	14	14	8.4	10	11	6.0	4.8	9.4	17	11	6.4	18	17	10	3	13
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	3.2	4.8	5.3	5.6	6.2	6.3	5.2	5.7	5.6	5.0	5.5	5.8	6.0	5.7	5.5	5.3
Total Phosphorus	mg/L	-	-	-	-	-	-	0.021	<0.02	<0.02	<0.02	-	-	-	-	0.024	<0.02	<0.02	
Reactive Silica (SiO ₂)	mg/L	-	-	3.0	3.0	4.1	1.2	2.2	1.6	1.6	1.5	3.0	3.0	2.1	2.5	6.5	2.7	1.0	2.1
Total Dissolved Solids ⁴	mg/L	-	-	48	13	15	12	11	6.0	8.0	8.0	12	11	11	12	18	11	5	9
Total Suspended Solids	mg/L	-	-	-	-	-	-	6.7	<1.3	1.2	2.4	-	-	-	-	2.2	2.1	<1	1.2
Dissolved Sulphate (SO ₄)	mg/L	-	-	37	<2	<2	3.9	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Turbidity	NTU	-	-	1.7	0.77	0.60	1.1	2.8	0.35	0.64	1.10	1.9	1.4	0.86	1.3	0.96	0.56	0.16	0.96
Conductivity	mS/cm	-	-	260	30	30	44	25	17	21	19	23	26	26	26	26	14	17	17



Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-11								SW-12							
				13-Oct-17	20-Dec-17	2-Apr-18	18-Jun-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	13-Oct-17	20-Dec-17	2-Apr-18	5-Jul-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19
Total Metals																			
Total Aluminum (Al)	mg/L	0.10 - 0.0050 ³	0.0050	0.32	0.29	0.30	0.24	0.25	0.13	0.13	0.19	0.33	0.24	0.16	0.38	0.32	0.18	0.05	0.23
Total Antimony (Sb)	mg/L	-	0.020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Arsenic (As)	mg/L	0.0050	0.0050	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Barium (Ba)	mg/L	-	1.0	0.0040	0.0048	0.0036	0.0030	0.0029	0.0015	0.0013	0.0023	0.0051	0.0039	0.0037	0.0030	0.0032	0.0021	<0.001	0.0019
Total Beryllium (Be)	mg/L	-	0.0053	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Bismuth (Bi)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron (B)	mg/L	1.5	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium (Cd)	mg/L	0.000040 ⁴	- ⁶	0.000014	0.000019	0.000018	<0.00001	0.000014	<0.00001	0.00001	0.000013	0.000020	0.000020	0.000022	0.000035	0.000018	0.000014	<0.00001	<0.00001
Total Calcium (Ca)	mg/L	-	-	0.86	0.81	0.80	0.60	0.67	0.33	0.27	0.44	0.84	0.69	0.65	1.1	1.4	0.54	0.30	0.64
Total Chromium (Cr)	mg/L	0.0089 ⁵	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt (Co)	mg/L	-	0.010	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.00046	0.00044	<0.0004	0.00054	0.00046	<0.0004	<0.0004	<0.0004
Total Copper (Cu)	mg/L	0.0020 ⁴	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Iron (Fe)	mg/L	0.30	0.30	0.37	0.33	0.18	0.23	0.37	0.16	0.10	0.19	1.2	0.55	0.26	0.74	1.2	0.29	0.05	0.41
Total Lead (Pb)	mg/L	0.0010 ⁴	0.0010	<0.0005	0.00066	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00059	<0.0005	<0.0005	0.00057	0.00057	<0.0005	<0.0005	<0.0005
Total Magnesium (Mg)	mg/L	-	-	0.41	0.42	0.45	0.29	0.34	0.18	0.18	0.23	0.51	0.44	0.41	0.36	0.41	0.28	0.13	0.25
Total Manganese (Mn)	mg/L	-	0.82	0.051	0.040	0.045	0.032	0.037	0.018	0.023	0.024	0.091	0.079	0.077	0.047	0.061	0.034	0.026	0.039
Total Molybdenum (Mo)	mg/L	0.073	0.073	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Nickel (Ni)	mg/L	0.025 ⁴	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Phosphorus (P)	mg/L	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Potassium (K)	mg/L	-	-	0.20	0.99	0.40	0.29	0.20	<0.1	0.16	0.21	0.26	0.28	0.35	0.17	0.25	0.11	0.19	0.16
Total Selenium (Se)	mg/L	0.0010	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Silver (Ag)	mg/L	0.00025	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Sodium (Na)	mg/L	-	-	2.4	3.0	3.0	2.4	2.8	1.2	1.6	2.0	2.1	2.1	2.4	2.7	3.0	2.2	1.3	2.2
Total Strontium (Sr)	mg/L	-	21	0.0085	0.0075	0.0078	0.0061	0.0060	0.0031	0.0027	0.0043	0.0085	0.0065	0.0060	0.0074	0.0076	0.0042	<0.002	0.0050
Total Thallium (Tl)	mg/L	0.00080	0.00080	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Tin (Sn)	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium (Ti)	mg/L	-	-	0.0040	0.0034	0.0024	0.0030	0.0030	<0.002	<0.002	0.0028	0.0041	0.0033	0.0026	0.0032	0.0044	0.0027	<0.002	0.0027
Total Tungsten (W)	mg/L	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Uranium (U)	mg/L	0.015	0.30	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium (V)	mg/L	-	0.0060	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Zinc (Zn)	mg/L	-	0.030	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0062	<0.005	<0.005	<0.005
Total Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	<0.002	<0.002	<0.002	-	-	-	-	-	<0.002	<0.002	<0.002
Dissolved Metals																			
Dissolved Aluminum (Al)	mg/L	-	-	-	-	-	-	0.21	0.15	0.09	0.18	-	-	-	-	0.28	0.17	0.06	0.21
Dissolved Antimony (Sb)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic (As)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	0.0013	<0.001	<0.001	<0.001
Dissolved Barium (Ba)	mg/L	-	-	-	-	-	-	0.0027	0.0018	0.0011	0.0023	-	-	-	-	0.0029	0.0021	0.0011	0.0019
Dissolved Beryllium (Be)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Bismuth (Bi)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Boron (B)	mg/L	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05
Dissolved Cadmium (Cd)	mg/L	-	-	-	-	-	-	0.000012	<0.00001	<0.00001	0.000012	-	-	-	-	0.000014	0.000013	<0.00001	0.000012
Dissolved Calcium (Ca)	mg/L	-	-	-	-	-	-	0.57	0.38	0.26	0.46	-	-	-	-	1.1	0.52	0.32	0.60
Dissolved Chromium (Cr)	mg/L	-	-	-	-	-	-	<0.001	<0.001	0.0011	0.0011	-	-	-	-	<0.001	<0.001	<0.001	0.0011
Dissolved Cobalt (Co)	mg/L	-	-	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	-	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004
Dissolved Copper (Cu)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005	-	-	-	-	<0.002	<0.002	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L	-	-	-	-	-	-	0.20	0.15	0.07	0.18	-	-	-	-	0.85	0.23	0.06	0.35
Dissolved Lead (Pb)	mg/L	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L	-	-	-	-	-	-	0.33	0.21	0.17	0.23	-	-	-	-	0.37	0.28	0.14	0.23
Dissolved Manganese (Mn)	mg/L	-	-	-	-	-	-	0.034	0.020	0.019	0.025	-	-	-	-	0.058	0.033	0.028	0.037
Dissolved Molybdenum (Mo)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel (Ni)	mg/L	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	-	-	-	-	<0.002	<0.002	<0.002	<0.002
Dissolved Phosphorus (P)	mg/L	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L	-	-	-	-	-	-	0.17	0.11	0.15	0.21	-	-	-	-	0.22	0.10	0.20	0.16
Dissolved Selenium (Se)	mg/L	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Dissolved Silver (Ag)	mg/L	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium (Na)	mg/L	-	-	-	-	-	-	2.6	1.5	1.5	2.0	-	-	-	-	3.0	2.3		

Parameters	Unit	CCME Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) ¹	Nova Scotia Environment Environmental Quality Standards for Surface Water, Table 3 ²	SW-13			SW-13-S				SW-13-D				SW-14				SW-16		
				13-Oct-17	20-Dec-17	2-Apr-18	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	10-Sep-18	5-Dec-18	26-Mar-19	03-Jun-19	5-Dec-18	26-Mar-19	03-Jun-19
Field Parameters																					
Temperature	°C	-	-	11	1.3	3.2	-	-	-	-	-	-	-	-	17	2.2	2.0	13.0	2.7	3.0	11.3
pH	pH	6.5 - 9.0	-	6.1	6.5	4.5	-	-	-	-	-	-	-	-	5.1	4.9	5.2	5.6	5.2	5.5	5.4
Conductivity	µS/cm	-	-	0.0030	0.015	0.030	-	-	-	-	-	-	-	-	0.028	0.017	0.013	0.017	0.015	0.012	0.016
Total Dissolved Solids	g/L	-	-	0.020	0.020	0.019	-	-	-	-	-	-	-	-	0.018	-	-	-	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	0.93	2.3	1.4	1.9	0.85	1.0
Dissolved Oxygen	mg/L	-	-	7.3	3.2	13	-	-	-	-	-	-	-	-	7.5	13	15	11	12	14	10
General Chemistry																					
Acidity	mg/L	-	-	-	-	-	-	5.2	<5	<5	-	6.6	<5	<5	-	5.6	<5	<5	5.0	5.2	<5
Total Alkalinity	mg/L CaCO ₃	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	-	-	3.9	3.3	3.0	3.2	3.4	2.5	2.5	3.3	3.4	2.6	2.6	3.3	3.6	2.7	2.7	3.7	2.7	2.9
Total Chemical Oxygen Demand	mg/L	-	-	-	-	-	33	21	<20	<20	26	23	<20	21	14	23	20	29	21	<20	22
Dissolved Chloride (Cl ⁻)	mg/L	120	-	4.6	3.7	5.2	5.5	4.8	4.6	3.5	5.3	5.6	4.6	3.8	5.0	5.1	4.2	4.2	4.2	3.5	3.0
Colour	TCU	-	-	150	110	100	50	76	47	64	52	82	47	61	27	73	41	42	75	40	59
Total Dissolved Solids	mg/L	-	-	-	-	-	-	10	22	29	-	14	22	25	-	18	21	-	<10	24	
Dissolved Fluoride (F ⁻)	mg/L	0.12	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	-	-	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite (NO ₂ ⁻)	mg/L as N	0.060	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃ ⁻) ⁴	mg/L as N	3.0	-	0.19	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	- ⁵	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.058	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.052	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	-	-	-	-	-	5.6	9.4	5.3	6.7	6.2	9.7	5.6	6.8	4.8	9.2	5.5	6.7	8.2	5.3	8.2
Total Organic Carbon (C)	mg/L	-	-	21	13	8.1	7.4	9.0	6.2	7.3	8.0	9.4	6.0	7.3	5.1	9.8	6.0	6.7	8.4	5.2	7.5
Orthophosphate (PO ₄ ³⁻)	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	6.5 - 9.0	-	3.8	5.0	5.6	6.2	5.5	5.6	5.9	6.1	5.3	5.4	6.0	6.1	5.6	5.8	6.2	5.7	5.9	5.7
Total Phosphorus	mg/L	-	-	-	-	-	-	0.025	0.023	<0.02	-	0.025	0.021	<0.02	-	0.023	<0.02	<0.02	0.021	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	-	-	4.2	3.9	2.5	1.6	3.0	2.0	1.5	1.7	3.1	2.0	1.6	1.6	3.1	2.1	1.4	2.7	1.7	1.6
Total Dissolved Solids ²	mg/L	-	-	28	12	12	13	12	11	13	13	13	10	14	12	13	10	10	11	9	11
Total Suspended Solids	mg/L	-	-	-	-	-	15	<1.3	1.6	<1	13	<1.3	<1	<1	4.8	1.0	<1	2.8	2.0	<1	2.0
Dissolved Sulphate (SO ₄)	mg/L	-	-	13	<2	<2	<2	<2	<2	3.9	<2	<2	<2	4.5	<2	<2	<2	<2	<2	<2	2.5
Turbidity	NTU	-	-	7.3	0.39	0.50	7.3	0.66	1.1	0.81	4.2	0.47	0.99	0.80	1.3	0.83	0.70	1.4	1.5	0.49	0.9
Conductivity	mS/cm	-	-	97	28	28	24	26	22	21	27	26	24	21	27	27	22	22	23	20	19



APPENDIX B

QA/QC Results

Parameters	Unit	Field Duplicates																	
		SW6	SW6 Duplicate	Relative Percent Difference ^(a)	SW1	SW1 Duplicate	Relative Percent Difference ^(a)	SW1	SW1 Duplicate	Relative Percent Difference ^(a)	SW6	SW6 Duplicate	Relative Percent Difference ^(a)	SW3	SW3 Duplicate	Relative Percent Difference ^(a)	SW16	SW16 Duplicate	Relative Percent Difference ^(a)
		10-Sep-18	10-Sep-18	(%)	5-Dec-18	5-Dec-18	(%)	26-Mar-19	26-Mar-19	(%)	26-Mar-19	26-Mar-19	(%)	3-Jun-19	3-Jun-19	(%)	3-Jun-19	3-Jun-19	(%)
Field Parameters																			
Temperature	°C	17	-	-	3.5	-	-	0.0	-	-	1.4	-	-	11.9	-	-	11.3	-	-
pH		4.7	-	-	4.9	-	-	4.9	-	-	5.1	-	-	5.4	-	-	5.4	-	-
Conductivity	µS/cm	0.027	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Total Dissolved Solids	g/L	0.017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	9.4	-	-	1.3	-	-	0.6	-	-	1.8	-	-	0.5	-	-	1.0	-	-
Dissolved Oxygen	mg/L	9.0	-	-	8.0	-	-	12.2	-	-	15.9	-	-	8.9	-	-	9.8	-	-
General Chemistry																			
Acidity	mg/L	-	-	-	6.8	8.6	-	8.6	11.0	-	5.2	<5	-	<5	<5	-	<5	5.8	-
Total Alkalinity	mg/L CaCO ₃	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Carbonate Alkalinity ⁴	mg/L CaCO ₃	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Hardness ⁴	mg/L CaCO ₃	3.4	3.3	-	3.2	3.1	-	2.2	2.2	-	2.7	2.7	-	2.3	2.2	-	2.9	2.9	-
Total Chemical Oxygen Demand	mg/L	26	28	-	30	28	-	20	20	-	20	20	-	<20	<20	-	22	22	-
Dissolved Chloride (Cl)	mg/L	5.4	5.5	1.8%	3.8	3.5	-	3.0	3.2	-	4.8	4.7	-	4.1	4.0	-	3.0	3.1	-
Colour	TCU	59	60	1.7%	93	96	3.2%	47	49	4.2%	47	47	0.0%	6	7	9.7%	59	57	3.4%
Total Dissolved Solids	mg/L	-	-	-	-	-	-	22	16	31.58%	36	25	36.07%	12	<10	0.00%	24	38	45.16%
Dissolved Fluoride (F)	mg/L	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Nitrate + Nitrite	mg/L as N	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	0.063	<0.05	0.00%	<0.05	<0.05	-	<0.05	<0.05	-
Nitrite (NO ₂)	mg/L as N	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Nitrate (NO ₃) ⁴	mg/L as N	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	0.063	<0.05	0.00%	<0.05	<0.05	-	<0.05	<0.05	-
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Dissolved Organic Carbon (C)	mg/L	6.0	6.1	1.7%	11	11	0.0%	5	5	2.0%	6	<0	0.0%	2	2	13.3%	8	8	0.0%
Total Organic Carbon (C)	mg/L	7.4	7.8	5.3%	12	12	0.0%	5	5	1.9%	6	6	0.0%	2	2	5.1%	8	8	2.6%
Orthophosphate (PO ₄ ³⁻)	mg/L	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
pH		6.3	6.2	1.1%	5.8	5.4	8.4%	6.1	5.9	4.3%	6.5	7.2	10.8%	6.2	6.0	2.8%	5.7	5.5	4.3%
Total Phosphorus	mg/L	-	-	-	0.025	0.030	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	<0.02	-
Reactive Silica (SiO ₂)	mg/L	1.6	1.6	-	3.2	3.1	3.2%	2.6	2.5	3.9%	2.3	1.9	19.0%	1.8	1.7	5.7%	1.6	1.6	0.0%
Total Dissolved Solids ⁴	mg/L	13	13	0.0%	11	10	9.5%	9	9	0.0%	15	11	30.8%	9	9	0.0%	11	11	0.0%
Total Suspended Solids	mg/L	14	13	7.4%	<1.3	<1.3	-	<1	<1	-	1	<1	0.00%	<1	<1	-	2	1.8	10.53%
Dissolved Sulphate (SO ₄)	mg/L	<2	<2	-	<2	<2	-	<2	<2	-	3.7	<2	0.00%	<2	<2	-	2.5	2.4	4.08%
Turbidity	NTU	7.0	5.0	33%	0.23	0.28	-	0.24	0.29	-	1.30	1.10	-	0.49	0.47	-	0.89	0.98	-
Conductivity	µS/cm	25	25	0.0%	25	24	4.1%	19	19	0.0%	26	27	3.8%	19	19	0.0%	19	19	0.0%



Parameters	Unit	Field Duplicates																	
		SW6	SW6 Duplicate	Relative Percent Difference ^(a)	SW1	SW1 Duplicate	Relative Percent Difference ^(a)	SW1	SW1 Duplicate	Relative Percent Difference ^(a)	SW6	SW6 Duplicate	Relative Percent Difference ^(a)	SW3	SW3 Duplicate	Relative Percent Difference ^(a)	SW16	SW16 Duplicate	Relative Percent Difference ^(a)
		10-Sep-18	10-Sep-18	(%)	5-Dec-18	5-Dec-18	(%)	26-Mar-19	26-Mar-19	(%)	26-Mar-19	26-Mar-19	(%)	3-Jun-19	3-Jun-19	(%)	3-Jun-19	3-Jun-19	(%)
Total Metals																			
Total Aluminum (Al)	mg/L	0.28	0.28	0.0%	0.24	0.24	0.0%	0.13	0.14	7.4%	0.17	0.18	5.7%	0.03	0.03	3.2%	0.21	0.22	4.7%
Total Antimony (Sb)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Total Arsenic (As)	mg/L	0.021	0.021	0.0%	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	0.0097	0.0096	1.04%
Total Barium (Ba)	mg/L	0.0039	0.0035	-	0.0041	0.0040	-	0.0023	0.0024	-	0.0037	0.0039	-	0.0045	0.0043	-	0.0037	0.0037	-
Total Beryllium (Be)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Total Bismuth (Bi)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Total Boron (B)	mg/L	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Total Cadmium (Cd)	mg/L	0.000014	0.000010	-	0.000014	0.000019	-	0.000019	<0.00001	-	0.000017	0.000020	-	<0.00001	<0.00001	-	0.000015	0.000014	-
Total Calcium (Ca)	mg/L	0.75	0.73	2.7%	0.69	0.70	1.4%	0.47	0.48	2.1%	0.59	0.58	1.7%	0.50	0.49	2.0%	0.68	0.68	0.0%
Total Chromium (Cr)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Total Cobalt (Co)	mg/L	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-
Total Copper (Cu)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	0.0061	<0.0005	0.00%
Total Iron (Fe)	mg/L	1.3	1.3	0.0%	0.17	0.17	-	0.10	0.10	-	0.17	0.17	-	<0.05	<0.05	-	0.26	0.26	-
Total Lead (Pb)	mg/L	0.00075	0.00075	-	<0.0005	<0.0005	-	0.00065	<0.0005	0.00%	<0.0005	<0.0005	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-
Total Magnesium (Mg)	mg/L	0.37	0.36	-	0.34	0.34	-	0.24	0.23	-	0.29	0.30	-	0.25	0.24	-	0.30	0.30	-
Total Manganese (Mn)	mg/L	0.068	0.068	0.0%	0.031	0.029	6.7%	0.032	0.028	13.3%	0.066	0.067	1.5%	0.017	0.017	0.0%	0.072	0.073	1.4%
Total Molybdenum (Mo)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Total Nickel (Ni)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Total Phosphorus (P)	mg/L	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Total Potassium (K)	mg/L	0.26	0.24	-	0.21	0.22	-	0.28	0.26	-	0.26	0.24	-	0.13	0.14	-	0.26	0.25	-
Total Selenium (Se)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Total Silver (Ag)	mg/L	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Total Sodium (Na)	mg/L	3.4	3.2	6.1%	2.4	2.2	8.7%	1.8	1.8	0.0%	2.8	2.8	0.0%	2.5	2.5	0.0%	2.1	2.1	0.0%
Total Strontium (Sr)	mg/L	0.0061	0.0057	-	0.0074	0.0069	-	0.0046	0.0043	-	0.0047	0.0041	-	0.0068	0.0063	-	0.0058	0.0060	-
Total Thallium (Tl)	mg/L	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Total Tin (Sn)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Total Titanium (Ti)	mg/L	0.011	0.011	0.0%	0.0034	0.0039	-	<0.002	<0.002	-	0.0024	0.0027	-	<0.002	<0.002	-	<0.002	0.0020	-
Total Tungsten (W)	mg/L	-	-	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Total Uranium (U)	mg/L	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Total Vanadium (V)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Total Zinc (Zn)	mg/L	<0.005	<0.005	-	<0.005	<0.005	-	0.0071	<0.005	0.00%	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-
Total Zirconium (Zr)	mg/L	-	-	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Dissolved Metals																			
Dissolved Aluminum (Al)	mg/L	0.095	0.097	2.1%	0.24	0.24	0.0%	0.13	0.13	0.0%	0.14	0.14	0.0%	0.03	0.03	20.7%	0.20	0.20	0.0%
Dissolved Antimony (Sb)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Dissolved Arsenic (As)	mg/L	0.0076	0.0077	1.3%	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	0.0083	0.0081	2.44%
Dissolved Barium (Ba)	mg/L	0.0030	0.0031	-	0.0041	0.0040	-	0.0025	0.0024	-	0.0038	0.0037	-	0.0044	0.0041	-	0.0036	0.0036	-
Dissolved Beryllium (Be)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Dissolved Bismuth (Bi)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Dissolved Boron (B)	mg/L	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-
Dissolved Cadmium (Cd)	mg/L	<0.00001	<0.00001	-	0.000017	0.000025	-	<0.00001	0.000012	-	0.000017	0.000019	-	0.000012	<0.00001	-	0.000013	0.000015	-
Dissolved Calcium (Ca)	mg/L	0.72	0.74	2.7%	0.74	0.70	5.6%	0.51	0.49	4.0%	0.67	0.61	9.4%	0.50	0.50	0.0%	0.69	0.71	2.9%
Dissolved Chromium (Cr)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	0.001	<0.001	0.00%	<0.001	<0.001	-	<0.001	0.0011	0.00%	<0.001	0.0011	0.00%
Dissolved Cobalt (Co)	mg/L	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-	<0.0004	<0.0004	-
Dissolved Copper (Cu)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Dissolved Iron (Fe)	mg/L	0.36	0.35	2.8%	0.48	0.19	-	0.09	0.09	-	0.13	0.13	-	-	<0.05	-	0.20	0.20	-
Dissolved Lead (Pb)	mg/L	<0.0005	<0.0005	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-	<0.0005	<0.0005	-
Dissolved Magnesium (Mg)	mg/L	0.34	0.34	-	0.45	0.34	-	0.23	0.23	-	0.29	0.28	-	0.24	0.24	-	0.30	0.31	-
Dissolved Manganese (Mn)	mg/L	0.057	0.059	3.4%	0.056	0.031	57%	0.028	0.030	7%	0.064	0.065	2%	0.020	0.016	22%	0.067	0.066	2%
Dissolved Molybdenum (Mo)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	0.004	<0.002	0.00%	<0.002	<0.002	-
Dissolved Nickel (Ni)	mg/L	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-	<0.002	<0.002	-
Dissolved Phosphorus (P)	mg/L	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Dissolved Potassium (K)	mg/L	0.25	0.27	7.7%	0.23	0.23	-	0.27	0.27	-	0.25	0.25	-	0.15	0.14	-	0.25	0.26	-
Dissolved Selenium (Se)	mg/L	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
Dissolved Silver (Ag)	mg/L	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
Dissolved Sodium (Na)	mg/L	3.2	3.3	3.1%	2.4	2.2	8.7%	1.9	1.8	5.4%	2.8	2.8	0.0%	2.4	2.4	0.0%	2.1	2.1	0.0%
Dissolved Strontium (Sr)	mg/L	0.0068	0.0076	-	0.0087														

Parameters	Unit	Detection Limit	Blanks													
			Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	
			10-Sep-18	5-Dec-18	26-Mar-19	26-Mar-19	26-Mar-19	03-Jun-19	03-Jun-19	03-Jun-19	26-Mar-19	26-Mar-19	26-Mar-19	03-Jun-19	03-Jun-19	03-Jun-19
Field Parameters																
Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids	g/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Acidity	mg/L	5.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Alkalinity	mg/L CaCO ₃	5.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity ⁴	mg/L CaCO ₃	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity ⁴	mg/L CaCO ₃	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness ⁴	mg/L CaCO ₃	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Chemical Oxygen Demand	mg/L	20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Dissolved Chloride (Cl ⁻)	mg/L	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Colour	TCU	5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Dissolved Solids	mg/L	10	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Dissolved Fluoride (F)	mg/L	0.10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L as N	0.050	<0.05	<0.05	0.088	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.054	<0.05	<0.05	<0.05	<0.05
Nitrite (NO ₂ ⁻)	mg/L as N	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (NO ₃ ⁻) ⁴	mg/L as N	0.050	<0.05	<0.05	0.088	0.063	<0.05	<0.05	<0.05	<0.05	<0.05	0.054	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.050	0.071	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Organic Carbon (C)	mg/L	0.50	-	<0.5	<0	6.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Total Organic Carbon (C)	mg/L	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Orthophosphate (PO ₄ ³⁻)	mg/L	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH	-	6.1	6.2	5.9	6.6	5.9	6.4	5.8	6.1	5.6	6.1	6.0	6.1	5.7	6.5
Total Phosphorus	mg/L	0.020	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Reactive Silica (SiO ₂)	mg/L	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Dissolved Solids ⁴	mg/L	1.0	<1	<1	<1	<1	<1	<1	<1	4	<1	<1	<1	<1	<1	<1
Total Suspended Solids	mg/L	1.3	<2.5	<1.3	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Sulphate (SO ₄)	mg/L	2.0	<2	<2	<2	<2	<2	<2	<2	4.1	<2	<2	<2	<2	<2	<2
Turbidity	NTU	0.10	0.15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	0.11	0.28	0.19
Conductivity	µS/cm	1.0	1.5	1.0	1.0	1.2	4.1	<1	<1	<1	4.4	1.4	<1	<1	<1	<1



APPENDIX C

Laboratory Certificates

Your Project #: 171-191
 Site Location: Fifeteen Mile Stream Gold Mine
 Your C.O.C. #: 619530-01-01

Attention: Meghan Milloy

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2017/07/19

Report #: R4604395

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E8674

Received: 2017/07/12, 14:13

Sample Matrix: Water
 # Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide	8	N/A	2017/07/18	N/A	SM 22 4500-CO2 D
Alkalinity	8	N/A	2017/07/18	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	8	N/A	2017/07/19	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	8	N/A	2017/07/18	ATL SOP 00020	SM 22 2120C m
Conductance - water	8	N/A	2017/07/17	ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	8	N/A	2017/07/17	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL)	8	2017/07/17	2017/07/18	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	8	2017/07/14	2017/07/15	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	8	N/A	2017/07/19	N/A	Auto Calc.
Anion and Cation Sum	8	N/A	2017/07/18	N/A	Auto Calc.
Nitrogen Ammonia - water	8	N/A	2017/07/18	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	8	N/A	2017/07/19	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	8	N/A	2017/07/19	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	8	N/A	2017/07/19	ATL SOP 00018	ASTM D3867-16
pH (1)	8	N/A	2017/07/17	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	8	N/A	2017/07/19	ATL SOP 00021	EPA 365.2 m
Sat. pH and Langelier Index (@ 20C)	8	N/A	2017/07/19	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	8	N/A	2017/07/19	ATL SOP 00049	Auto Calc.
Reactive Silica	8	N/A	2017/07/19	ATL SOP 00022	EPA 366.0 m
Sulphate	8	N/A	2017/07/18	ATL SOP 00023	ASTMD516-11 m
Total Dissolved Solids (TDS calc)	8	N/A	2017/07/19	N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	8	N/A	2017/07/18	ATL SOP 00037	SM 22 5310C m
Turbidity	8	N/A	2017/07/18	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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

Your Project #: 171-191
Site Location: Fifeteen Mile Stream Gold Mine
Your C.O.C. #: 619530-01-01

Attention: Meghan Milloy

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2017/07/19
Report #: R4604395
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E8674

Received: 2017/07/12, 14:13

indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) 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.

(2) 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.

Keri Mackay, Project Manager - Bedford

Email: kmackay@maxxam.ca

Phone# (902)420-0203 Ext:294

=====
This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		ESZ684		ESZ685		ESZ686		ESZ687		
Sampling Date		2017/07/11 10:00		2017/07/11 10:30		2017/07/11 11:00		2017/07/11 13:00		
COC Number		619530-01-01		619530-01-01		619530-01-01		619530-01-01		
	UNITS	SW-1	RDL	SW-2	QC Batch	SW-3	RDL	SW-4	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	0.0900	N/A	0.0700	5073053	0.0600	N/A	0.290	N/A	5073053
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	5073048	ND	1.0	9.6	1.0	5073048
Calculated TDS	mg/L	10	1.0	7.0	5073057	6.0	1.0	21	1.0	5073057
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	5073048	ND	1.0	ND	1.0	5073048
Cation Sum	me/L	0.190	N/A	0.130	5073053	0.130	N/A	0.360	N/A	5073053
Hardness (CaCO3)	mg/L	3.5	1.0	2.2	5073051	2.4	1.0	9.0	1.0	5073051
Ion Balance (% Difference)	%	35.7	N/A	30.0	5073052	36.8	N/A	10.8	N/A	5073052
Langelier Index (@ 20C)	N/A	NC		NC	5073055	NC		-3.25		5073055
Langelier Index (@ 4C)	N/A	NC		NC	5073056	NC		-3.51		5073056
Nitrate (N)	mg/L	ND	0.050	ND	5073054	ND	0.050	0.054	0.050	5073054
Saturation pH (@ 20C)	N/A	NC		NC	5073055	NC		9.83		5073055
Saturation pH (@ 4C)	N/A	NC		NC	5073056	NC		10.1		5073056
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5076251	ND	5.0	9.6	5.0	5076251
Dissolved Chloride (Cl)	mg/L	3.1	1.0	2.6	5076252	2.1	1.0	3.3	1.0	5076252
Colour	TCU	120	25	36	5076264	7.9	5.0	62	25	5076264
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	5076276	ND	0.050	0.054	0.050	5076276
Nitrite (N)	mg/L	ND	0.010	ND	5076280	ND	0.010	ND	0.010	5076280
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	5075774	ND	0.050	0.055	0.050	5075774
Total Organic Carbon (C)	mg/L	11	0.50	4.3	5077602	2.7	0.50	7.6	0.50	5077695
Orthophosphate (P)	mg/L	ND	0.010	ND	5076265	ND	0.010	0.034	0.010	5076265
pH	pH	5.63	N/A	6.07	5077032	6.01	N/A	6.57	N/A	5077032
Reactive Silica (SiO2)	mg/L	2.4	0.50	1.2	5076258	1.5	0.50	3.4	0.50	5076258
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	5076254	ND	2.0	ND	2.0	5076254
Turbidity	NTU	0.40	0.10	1.3	5076092	0.84	0.10	2.6	0.10	5076092
Conductivity	uS/cm	21	1.0	16	5077041	15	1.0	32	1.0	5077041
Metals										
Total Aluminum (Al)	ug/L	300	5.0	130	5073252	47	5.0	190	5.0	5073252
Total Antimony (Sb)	ug/L	ND	1.0	ND	5073252	ND	1.0	ND	1.0	5073252
Total Arsenic (As)	ug/L	3.4	1.0	ND	5073252	ND	1.0	200	1.0	5073252
Total Barium (Ba)	ug/L	4.8	1.0	3.2	5073252	5.2	1.0	5.0	1.0	5073252
Total Beryllium (Be)	ug/L	ND	1.0	ND	5073252	ND	1.0	ND	1.0	5073252
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable ND = Not detected										

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		ESZ684		ESZ685		ESZ686		ESZ687		
Sampling Date		2017/07/11 10:00		2017/07/11 10:30		2017/07/11 11:00		2017/07/11 13:00		
COC Number		619530-01-01		619530-01-01		619530-01-01		619530-01-01		
	UNITS	SW-1	RDL	SW-2	QC Batch	SW-3	RDL	SW-4	RDL	QC Batch
Total Bismuth (Bi)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Boron (B)	ug/L	ND	50	ND	5073252	ND	50	ND	50	5073252
Total Cadmium (Cd)	ug/L	0.016	0.010	0.012	5073252	ND	0.010	0.014	0.010	5073252
Total Calcium (Ca)	ug/L	840	100	460	5073252	590	100	2900	100	5073252
Total Chromium (Cr)	ug/L	ND	1.0	ND	5073252	ND	1.0	ND	1.0	5073252
Total Cobalt (Co)	ug/L	ND	0.40	ND	5073252	ND	0.40	1.8	0.40	5073252
Total Copper (Cu)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Iron (Fe)	ug/L	330	50	140	5073252	54	50	1900	50	5073252
Total Lead (Pb)	ug/L	ND	0.50	ND	5073252	ND	0.50	0.91	0.50	5073252
Total Magnesium (Mg)	ug/L	340	100	250	5073252	230	100	390	100	5073252
Total Manganese (Mn)	ug/L	52	2.0	46	5073252	14	2.0	490	2.0	5073252
Total Molybdenum (Mo)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Nickel (Ni)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Phosphorus (P)	ug/L	ND	100	ND	5073252	ND	100	ND	100	5073252
Total Potassium (K)	ug/L	220	100	230	5073252	130	100	370	100	5073252
Total Selenium (Se)	ug/L	ND	1.0	ND	5073252	ND	1.0	ND	1.0	5073252
Total Silver (Ag)	ug/L	ND	0.10	ND	5073252	ND	0.10	ND	0.10	5073252
Total Sodium (Na)	ug/L	2300	100	1800	5073252	1800	100	2300	100	5073252
Total Strontium (Sr)	ug/L	7.8	2.0	5.2	5073252	7.3	2.0	11	2.0	5073252
Total Thallium (Tl)	ug/L	ND	0.10	ND	5073252	ND	0.10	ND	0.10	5073252
Total Tin (Sn)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Titanium (Ti)	ug/L	3.3	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Uranium (U)	ug/L	ND	0.10	ND	5073252	ND	0.10	ND	0.10	5073252
Total Vanadium (V)	ug/L	ND	2.0	ND	5073252	ND	2.0	ND	2.0	5073252
Total Zinc (Zn)	ug/L	ND	5.0	ND	5073252	ND	5.0	ND	5.0	5073252

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		ESZ688		ESZ689		ESZ690	ESZ691		
Sampling Date		2017/07/11 14:00		2017/07/11 15:00		2017/07/11 15:30	2017/07/11 16:00		
COC Number		619530-01-01		619530-01-01		619530-01-01	619530-01-01		
	UNITS	SW-5	QC Batch	SW-6	RDL	SW-7	SW-8	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.0900	5073053	0.110	N/A	0.0900	0.100	N/A	5073053
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	5073048	ND	1.0	ND	ND	1.0	5073048
Calculated TDS	mg/L	9.0	5073057	9.0	1.0	10	8.0	1.0	5073057
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	5073048	ND	1.0	ND	ND	1.0	5073048
Cation Sum	me/L	0.170	5073053	0.180	N/A	0.180	0.170	N/A	5073053
Hardness (CaCO3)	mg/L	2.8	5073051	3.1	1.0	3.7	2.8	1.0	5073051
Ion Balance (% Difference)	%	30.8	5073052	24.1	N/A	33.3	25.9	N/A	5073052
Langelier Index (@ 20C)	N/A	NC	5073055	NC		NC	NC		5073055
Langelier Index (@ 4C)	N/A	NC	5073056	NC		NC	NC		5073056
Nitrate (N)	mg/L	0.058	5073054	ND	0.050	ND	ND	0.050	5073054
Saturation pH (@ 20C)	N/A	NC	5073055	NC		NC	NC		5073055
Saturation pH (@ 4C)	N/A	NC	5073056	NC		NC	NC		5073056
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5076251	ND	5.0	ND	ND	5.0	5076251
Dissolved Chloride (Cl)	mg/L	3.0	5076252	3.8	1.0	3.1	3.4	1.0	5076252
Colour	TCU	74	5076264	87	25	41	49	5.0	5076264
Nitrate + Nitrite (N)	mg/L	0.058	5076276	ND	0.050	ND	ND	0.050	5076276
Nitrite (N)	mg/L	ND	5076280	ND	0.010	ND	ND	0.010	5076280
Nitrogen (Ammonia Nitrogen)	mg/L	ND	5075774	ND	0.050	ND	ND	0.050	5075774
Total Organic Carbon (C)	mg/L	6.1	5077695	7.5	0.50	8.1	6.2	0.50	5077695
Orthophosphate (P)	mg/L	ND	5076265	ND	0.010	ND	ND	0.010	5076265
pH	pH	5.86	5077032	5.86	N/A	5.93	6.32	N/A	5077032
Reactive Silica (SiO2)	mg/L	1.6	5076258	1.6	0.50	2.3	1.3	0.50	5076258
Dissolved Sulphate (SO4)	mg/L	ND	5076254	ND	2.0	ND	ND	2.0	5076254
Turbidity	NTU	0.97	5076096	0.68	0.10	0.39	0.59	0.10	5076092
Conductivity	uS/cm	17	5077041	21	1.0	20	20	1.0	5077041
Metals									
Total Aluminum (Al)	ug/L	180	5073252	220	5.0	140	180	5.0	5073252
Total Antimony (Sb)	ug/L	ND	5073252	ND	1.0	ND	ND	1.0	5073252
Total Arsenic (As)	ug/L	37	5073252	4.8	1.0	4.2	ND	1.0	5073252
Total Barium (Ba)	ug/L	3.5	5073252	4.2	1.0	3.2	4.4	1.0	5073252
Total Beryllium (Be)	ug/L	ND	5073252	ND	1.0	ND	ND	1.0	5073252
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable ND = Not detected									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		ESZ688		ESZ689		ESZ690	ESZ691		
Sampling Date		2017/07/11 14:00		2017/07/11 15:00		2017/07/11 15:30	2017/07/11 16:00		
COC Number		619530-01-01		619530-01-01		619530-01-01	619530-01-01		
	UNITS	SW-5	QC Batch	SW-6	RDL	SW-7	SW-8	RDL	QC Batch
Total Bismuth (Bi)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Boron (B)	ug/L	ND	5073252	ND	50	ND	ND	50	5073252
Total Cadmium (Cd)	ug/L	0.013	5073252	0.014	0.010	ND	ND	0.010	5073252
Total Calcium (Ca)	ug/L	670	5073252	720	100	940	640	100	5073252
Total Chromium (Cr)	ug/L	ND	5073252	ND	1.0	ND	ND	1.0	5073252
Total Cobalt (Co)	ug/L	0.45	5073252	ND	0.40	0.78	ND	0.40	5073252
Total Copper (Cu)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Iron (Fe)	ug/L	590	5073252	330	50	500	200	50	5073252
Total Lead (Pb)	ug/L	ND	5073252	ND	0.50	ND	ND	0.50	5073252
Total Magnesium (Mg)	ug/L	280	5073252	310	100	340	300	100	5073252
Total Manganese (Mn)	ug/L	110	5073252	72	2.0	460	35	2.0	5073252
Total Molybdenum (Mo)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Nickel (Ni)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Phosphorus (P)	ug/L	ND	5073252	ND	100	ND	ND	100	5073252
Total Potassium (K)	ug/L	230	5073252	280	100	ND	250	100	5073252
Total Selenium (Se)	ug/L	ND	5073252	ND	1.0	ND	ND	1.0	5073252
Total Silver (Ag)	ug/L	ND	5073252	ND	0.10	ND	ND	0.10	5073252
Total Sodium (Na)	ug/L	1900	5073252	2400	100	2000	2300	100	5073252
Total Strontium (Sr)	ug/L	6.3	5073252	6.1	2.0	5.4	4.9	2.0	5073252
Total Thallium (Tl)	ug/L	ND	5073252	ND	0.10	ND	ND	0.10	5073252
Total Tin (Sn)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Titanium (Ti)	ug/L	2.0	5073252	ND	2.0	ND	ND	2.0	5073252
Total Uranium (U)	ug/L	ND	5073252	ND	0.10	ND	ND	0.10	5073252
Total Vanadium (V)	ug/L	ND	5073252	ND	2.0	ND	ND	2.0	5073252
Total Zinc (Zn)	ug/L	ND	5073252	ND	5.0	ND	ND	5.0	5073252
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		ESZ684	ESZ685	ESZ686	ESZ687	ESZ688	ESZ689		
Sampling Date		2017/07/11 10:00	2017/07/11 10:30	2017/07/11 11:00	2017/07/11 13:00	2017/07/11 14:00	2017/07/11 15:00		
COC Number		619530-01-01	619530-01-01	619530-01-01	619530-01-01	619530-01-01	619530-01-01		
	UNITS	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	ND	ND	ND	0.030	0.017	ND	0.013	5075878

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam ID		ESZ690	ESZ691		
Sampling Date		2017/07/11 15:30	2017/07/11 16:00		
COC Number		619530-01-01	619530-01-01		
	UNITS	SW-7	SW-8	RDL	QC Batch

Metals					
Total Mercury (Hg)	ug/L	ND	ND	0.013	5075878

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.0°C
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Sample ESZ684 [SW-1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ685 [SW-2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ686 [SW-3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ687 [SW-4] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ688 [SW-5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ689 [SW-6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ690 [SW-7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ESZ691 [SW-8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC		QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
Batch	Init							
5073252	BAN	Matrix Spike	Total Aluminum (Al)	2017/07/17		99	%	80 - 120
			Total Antimony (Sb)	2017/07/17		101	%	80 - 120
			Total Arsenic (As)	2017/07/17		90	%	80 - 120
			Total Barium (Ba)	2017/07/17		99	%	80 - 120
			Total Beryllium (Be)	2017/07/17		92	%	80 - 120
			Total Bismuth (Bi)	2017/07/17		102	%	80 - 120
			Total Boron (B)	2017/07/17		91	%	80 - 120
			Total Cadmium (Cd)	2017/07/17		98	%	80 - 120
			Total Calcium (Ca)	2017/07/17		104	%	80 - 120
			Total Chromium (Cr)	2017/07/17		92	%	80 - 120
			Total Cobalt (Co)	2017/07/17		94	%	80 - 120
			Total Copper (Cu)	2017/07/17		90	%	80 - 120
			Total Iron (Fe)	2017/07/17		96	%	80 - 120
			Total Lead (Pb)	2017/07/17		102	%	80 - 120
			Total Magnesium (Mg)	2017/07/17		92	%	80 - 120
			Total Manganese (Mn)	2017/07/17		94	%	80 - 120
			Total Molybdenum (Mo)	2017/07/17		100	%	80 - 120
			Total Nickel (Ni)	2017/07/17		92	%	80 - 120
			Total Phosphorus (P)	2017/07/17		99	%	80 - 120
			Total Potassium (K)	2017/07/17		102	%	80 - 120
			Total Selenium (Se)	2017/07/17		91	%	80 - 120
			Total Silver (Ag)	2017/07/17		97	%	80 - 120
			Total Sodium (Na)	2017/07/17		100	%	80 - 120
			Total Strontium (Sr)	2017/07/17		100	%	80 - 120
			Total Thallium (Tl)	2017/07/17		103	%	80 - 120
			Total Tin (Sn)	2017/07/17		106	%	80 - 120
			Total Titanium (Ti)	2017/07/17		90	%	80 - 120
			Total Uranium (U)	2017/07/17		104	%	80 - 120
			Total Vanadium (V)	2017/07/17		94	%	80 - 120
			Total Zinc (Zn)	2017/07/17		NC	%	80 - 120
			5073252	BAN	Spiked Blank	Total Aluminum (Al)	2017/07/17	
Total Antimony (Sb)	2017/07/17					101	%	80 - 120
Total Arsenic (As)	2017/07/17					88	%	80 - 120
Total Barium (Ba)	2017/07/17					99	%	80 - 120
Total Beryllium (Be)	2017/07/17					92	%	80 - 120
Total Bismuth (Bi)	2017/07/17					102	%	80 - 120
Total Boron (B)	2017/07/17					91	%	80 - 120
Total Cadmium (Cd)	2017/07/17					98	%	80 - 120
Total Calcium (Ca)	2017/07/17					105	%	80 - 120
Total Chromium (Cr)	2017/07/17					92	%	80 - 120
Total Cobalt (Co)	2017/07/17					94	%	80 - 120
Total Copper (Cu)	2017/07/17					92	%	80 - 120
Total Iron (Fe)	2017/07/17					95	%	80 - 120
Total Lead (Pb)	2017/07/17					100	%	80 - 120
Total Magnesium (Mg)	2017/07/17					93	%	80 - 120
Total Manganese (Mn)	2017/07/17					96	%	80 - 120
Total Molybdenum (Mo)	2017/07/17					100	%	80 - 120
Total Nickel (Ni)	2017/07/17		92	%	80 - 120			
Total Phosphorus (P)	2017/07/17		100	%	80 - 120			
Total Potassium (K)	2017/07/17		103	%	80 - 120			
Total Selenium (Se)	2017/07/17		91	%	80 - 120			
Total Silver (Ag)	2017/07/17		97	%	80 - 120			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Sodium (Na)	2017/07/17		103	%	80 - 120
			Total Strontium (Sr)	2017/07/17		99	%	80 - 120
			Total Thallium (Tl)	2017/07/17		102	%	80 - 120
			Total Tin (Sn)	2017/07/17		105	%	80 - 120
			Total Titanium (Ti)	2017/07/17		89	%	80 - 120
			Total Uranium (U)	2017/07/17		104	%	80 - 120
			Total Vanadium (V)	2017/07/17		94	%	80 - 120
			Total Zinc (Zn)	2017/07/17		95	%	80 - 120
5073252	BAN	Method Blank	Total Aluminum (Al)	2017/07/17	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Boron (B)	2017/07/17	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2017/07/17	ND, RDL=0.010		ug/L	
			Total Calcium (Ca)	2017/07/17	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2017/07/17	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2017/07/17	ND, RDL=50		ug/L	
			Total Lead (Pb)	2017/07/17	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2017/07/17	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2017/07/17	ND, RDL=100		ug/L	
			Total Potassium (K)	2017/07/17	ND, RDL=100		ug/L	
			Total Selenium (Se)	2017/07/17	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2017/07/17	ND, RDL=0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Sodium (Na)	2017/07/17	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2017/07/17	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2017/07/17	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2017/07/17	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2017/07/17	ND, RDL=5.0		ug/L	
5073252	BAN	RPD	Total Aluminum (Al)	2017/07/17	1.7		%	20
			Total Antimony (Sb)	2017/07/17	NC		%	20
			Total Arsenic (As)	2017/07/17	NC		%	20
			Total Barium (Ba)	2017/07/17	11		%	20
			Total Beryllium (Be)	2017/07/17	NC		%	20
			Total Bismuth (Bi)	2017/07/17	NC		%	20
			Total Boron (B)	2017/07/17	NC		%	20
			Total Cadmium (Cd)	2017/07/17	NC		%	20
			Total Calcium (Ca)	2017/07/17	4.2		%	20
			Total Chromium (Cr)	2017/07/17	NC		%	20
			Total Cobalt (Co)	2017/07/17	NC		%	20
			Total Copper (Cu)	2017/07/17	2.2		%	20
			Total Iron (Fe)	2017/07/17	NC		%	20
			Total Lead (Pb)	2017/07/17	NC		%	20
			Total Magnesium (Mg)	2017/07/17	1.1		%	20
			Total Manganese (Mn)	2017/07/17	2.0		%	20
			Total Molybdenum (Mo)	2017/07/17	NC		%	20
			Total Nickel (Ni)	2017/07/17	NC		%	20
			Total Phosphorus (P)	2017/07/17	NC		%	20
			Total Potassium (K)	2017/07/17	1.6		%	20
			Total Selenium (Se)	2017/07/17	NC		%	20
			Total Silver (Ag)	2017/07/17	NC		%	20
			Total Sodium (Na)	2017/07/17	3.2		%	20
			Total Strontium (Sr)	2017/07/17	2.1		%	20
			Total Thallium (Tl)	2017/07/17	NC		%	20
			Total Tin (Sn)	2017/07/17	NC		%	20
			Total Titanium (Ti)	2017/07/17	NC		%	20
			Total Uranium (U)	2017/07/17	NC		%	20
			Total Vanadium (V)	2017/07/17	NC		%	20
			Total Zinc (Zn)	2017/07/17	0.33		%	20
5075774	NRG	Matrix Spike [ESZ687-03]	Nitrogen (Ammonia Nitrogen)	2017/07/18		114	%	80 - 120
5075774	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2017/07/18		115	%	80 - 120
5075774	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2017/07/18	ND, RDL=0.050		mg/L	
5075774	NRG	RPD [ESZ687-03]	Nitrogen (Ammonia Nitrogen)	2017/07/18	NC		%	20
5075878	ARS	Matrix Spike	Total Mercury (Hg)	2017/07/18		105	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5075878	ARS	Spiked Blank	Total Mercury (Hg)	2017/07/18		106	%	80 - 120
5075878	ARS	Method Blank	Total Mercury (Hg)	2017/07/18	ND, RDL=0.013		ug/L	
5075878	ARS	RPD	Total Mercury (Hg)	2017/07/18	NC		%	20
5076092	SSI	QC Standard	Turbidity	2017/07/18		98	%	80 - 120
5076092	SSI	Spiked Blank	Turbidity	2017/07/18		95	%	80 - 120
5076092	SSI	Method Blank	Turbidity	2017/07/18	ND, RDL=0.10		NTU	
5076092	SSI	RPD	Turbidity	2017/07/18	0.96		%	20
5076096	SSI	QC Standard	Turbidity	2017/07/18		98	%	80 - 120
5076096	SSI	Spiked Blank	Turbidity	2017/07/18		94	%	80 - 120
5076096	SSI	Method Blank	Turbidity	2017/07/18	ND, RDL=0.10		NTU	
5076096	SSI	RPD [ESZ688-01]	Turbidity	2017/07/18	7.9		%	20
5076251	NRG	Matrix Spike [ESZ688-01]	Total Alkalinity (Total as CaCO3)	2017/07/18		109	%	80 - 120
5076251	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/07/18		108	%	80 - 120
5076251	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2017/07/18	ND, RDL=5.0		mg/L	
5076251	NRG	RPD [ESZ688-01]	Total Alkalinity (Total as CaCO3)	2017/07/18	NC		%	25
5076252	NRG	Matrix Spike [ESZ688-01]	Dissolved Chloride (Cl)	2017/07/19		102	%	80 - 120
5076252	NRG	QC Standard	Dissolved Chloride (Cl)	2017/07/19		107	%	80 - 120
5076252	NRG	Spiked Blank	Dissolved Chloride (Cl)	2017/07/19		99	%	80 - 120
5076252	NRG	Method Blank	Dissolved Chloride (Cl)	2017/07/19	ND, RDL=1.0		mg/L	
5076252	NRG	RPD [ESZ688-01]	Dissolved Chloride (Cl)	2017/07/19	3.7		%	25
5076254	NRG	Matrix Spike [ESZ688-01]	Dissolved Sulphate (SO4)	2017/07/18		104	%	80 - 120
5076254	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2017/07/18		98	%	80 - 120
5076254	NRG	Method Blank	Dissolved Sulphate (SO4)	2017/07/18	ND, RDL=2.0		mg/L	
5076254	NRG	RPD [ESZ688-01]	Dissolved Sulphate (SO4)	2017/07/18	NC		%	25
5076258	NRG	Matrix Spike [ESZ688-01]	Reactive Silica (SiO2)	2017/07/18		113	%	80 - 120
5076258	NRG	Spiked Blank	Reactive Silica (SiO2)	2017/07/19		99	%	80 - 120
5076258	NRG	Method Blank	Reactive Silica (SiO2)	2017/07/19	ND, RDL=0.50		mg/L	
5076258	NRG	RPD [ESZ688-01]	Reactive Silica (SiO2)	2017/07/18	0.26		%	25
5076264	NRG	Spiked Blank	Colour	2017/07/18		107	%	80 - 120
5076264	NRG	Method Blank	Colour	2017/07/18	ND, RDL=5.0		TCU	
5076264	NRG	RPD [ESZ688-01]	Colour	2017/07/18	9.0		%	20
5076265	NRG	Matrix Spike [ESZ688-01]	Orthophosphate (P)	2017/07/19		98	%	80 - 120
5076265	NRG	Spiked Blank	Orthophosphate (P)	2017/07/19		97	%	80 - 120
5076265	NRG	Method Blank	Orthophosphate (P)	2017/07/19	ND, RDL=0.010		mg/L	
5076265	NRG	RPD [ESZ688-01]	Orthophosphate (P)	2017/07/19	NC		%	25
5076276	NRG	Matrix Spike [ESZ688-01]	Nitrate + Nitrite (N)	2017/07/19		97	%	80 - 120
5076276	NRG	Spiked Blank	Nitrate + Nitrite (N)	2017/07/19		94	%	80 - 120
5076276	NRG	Method Blank	Nitrate + Nitrite (N)	2017/07/19	ND, RDL=0.050		mg/L	
5076276	NRG	RPD [ESZ688-01]	Nitrate + Nitrite (N)	2017/07/19	1.4		%	25
5076280	NRG	Matrix Spike [ESZ688-01]	Nitrite (N)	2017/07/19		93	%	80 - 120
5076280	NRG	Spiked Blank	Nitrite (N)	2017/07/19		101	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5076280	NRG	Method Blank	Nitrite (N)	2017/07/19	ND, RDL=0.010		mg/L	
5076280	NRG	RPD [ESZ688-01]	Nitrite (N)	2017/07/19	NC		%	25
5077032	KMC	QC Standard	pH	2017/07/17		101	%	97 - 103
5077032	KMC	RPD [ESZ684-01]	pH	2017/07/17	1.9		%	N/A
5077041	KMC	Spiked Blank	Conductivity	2017/07/17		102	%	80 - 120
5077041	KMC	Method Blank	Conductivity	2017/07/17	1.8, RDL=1.0		uS/cm	
5077041	KMC	RPD [ESZ684-01]	Conductivity	2017/07/17	3.8		%	25
5077602	SMT	Matrix Spike	Total Organic Carbon (C)	2017/07/18		101	%	80 - 120
5077602	SMT	Spiked Blank	Total Organic Carbon (C)	2017/07/18		101	%	80 - 120
5077602	SMT	Method Blank	Total Organic Carbon (C)	2017/07/18	ND, RDL=0.50		mg/L	
5077602	SMT	RPD	Total Organic Carbon (C)	2017/07/18	NC (1)		%	20
5077695	SMT	Matrix Spike	Total Organic Carbon (C)	2017/07/18		99	%	80 - 120
5077695	SMT	Spiked Blank	Total Organic Carbon (C)	2017/07/18		101	%	80 - 120
5077695	SMT	Method Blank	Total Organic Carbon (C)	2017/07/18	ND, RDL=0.50		mg/L	
5077695	SMT	RPD	Total Organic Carbon (C)	2017/07/18	NC (2)		%	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.

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) Reporting limit was increased due to turbidity.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Kevin A. MacDonald

Kevin MacDonald, Inorganics Supervisor

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2017/10/20

Report #: R4794150

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M7796

Received: 2017/10/13, 12:02

Sample Matrix: Water
Samples Received: 13

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	13	N/A	2017/10/18 N/A	SM 22 4500-CO2 D
Alkalinity	11	N/A	2017/10/18 ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	2	N/A	2017/10/19 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	13	N/A	2017/10/19 ATL SOP 00014	SM 22 4500-Cl- E m
Colour	13	N/A	2017/10/18 ATL SOP 00020	SM 22 2120C m
Conductance - water	13	N/A	2017/10/18 ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	13	N/A	2017/10/19 ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL)	13	2017/10/16	2017/10/17 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	13	2017/10/17	2017/10/18 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	13	N/A	2017/10/19 N/A	Auto Calc.
Anion and Cation Sum	13	N/A	2017/10/19 N/A	Auto Calc.
Nitrogen Ammonia - water	13	N/A	2017/10/18 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	13	N/A	2017/10/18 ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	13	N/A	2017/10/18 ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	13	N/A	2017/10/19 ATL SOP 00018	ASTM D3867-16
pH (1)	13	N/A	2017/10/18 ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	13	N/A	2017/10/18 ATL SOP 00021	SM 22 4500-P E m
Sat. pH and Langelier Index (@ 20C)	13	N/A	2017/10/19 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	13	N/A	2017/10/19 ATL SOP 00049	Auto Calc.
Reactive Silica	1	N/A	2017/10/18 ATL SOP 00022	EPA 366.0 m
Reactive Silica	12	N/A	2017/10/19 ATL SOP 00022	EPA 366.0 m
Sulphate	13	N/A	2017/10/19 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	13	N/A	2017/10/19 N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	13	N/A	2017/10/20 ATL SOP 00037	SM 22 5310C m
Turbidity	13	N/A	2017/10/18 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using

Your Project #: 17-191FMS
Your C.O.C. #: 632094-01-01, 632094-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2017/10/20
Report #: R4794150
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7M7796

Received: 2017/10/13, 12:02

accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) 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.

(2) 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.

Keri Mackay, Project Manager - Bedford

Email: kmackay@maxxam.ca

Phone# (902)420-0203 Ext:294

=====
This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF017			FIF018		FIF019		
Sampling Date		2017/10/10 15:05			2017/10/10 14:31		2017/10/10 15:50		
COC Number		632094-01-01			632094-01-01		632094-01-01		
	UNITS	SW-1	RDL	QC Batch	SW-2	QC Batch	SW-3	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.140	N/A	5213207	0.100	5213207	0.0900	N/A	5213207
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5213214	ND	5213214	ND	1.0	5213214
Calculated TDS	mg/L	16	1.0	5213212	8.0	5213212	8.0	1.0	5213212
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5213214	ND	5213214	ND	1.0	5213214
Cation Sum	me/L	0.230	N/A	5213207	0.150	5213207	0.140	N/A	5213207
Hardness (CaCO3)	mg/L	4.7	1.0	5213205	2.2	5213205	2.4	1.0	5213205
Ion Balance (% Difference)	%	24.3	N/A	5213206	20.0	5213206	21.7	N/A	5213206
Langelier Index (@ 20C)	N/A	NC		5213210	NC	5213210	NC		5213210
Langelier Index (@ 4C)	N/A	NC		5213211	NC	5213211	NC		5213211
Nitrate (N)	mg/L	ND	0.050	5213208	ND	5213208	ND	0.050	5213208
Saturation pH (@ 20C)	N/A	NC		5213210	NC	5213210	NC		5213210
Saturation pH (@ 4C)	N/A	NC		5213211	NC	5213211	NC		5213211
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	5215638	ND	5215638	ND	5.0	5215638
Dissolved Chloride (Cl)	mg/L	4.8	1.0	5215640	3.7	5215640	3.3	1.0	5215640
Colour	TCU	110 (1)	25	5215649	17	5215649	15	5.0	5215649
Nitrate + Nitrite (N)	mg/L	ND	0.050	5215656	ND	5215656	ND	0.050	5215656
Nitrite (N)	mg/L	ND	0.010	5215660	ND	5215660	ND	0.010	5215660
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	5217622	ND	5217622	ND	0.050	5217622
Total Organic Carbon (C)	mg/L	14	0.50	5222631	4.1	5222631	3.4	0.50	5222631
Orthophosphate (P)	mg/L	ND	0.010	5215653	ND	5215653	ND	0.010	5215653
pH	pH	5.75	N/A	5217401	5.28	5217401	5.89	N/A	5217401
Reactive Silica (SiO2)	mg/L	6.1	0.50	5215646	0.78	5215646	2.0	0.50	5215646
Dissolved Sulphate (SO4)	mg/L	ND	2.0	5215643	ND	5215643	ND	2.0	5215643
Turbidity	NTU	0.38	0.10	5217423	1.9	5217419	0.65	0.10	5217423
Conductivity	uS/cm	25	1.0	5217402	17	5217402	16	1.0	5217402
Metals									
Total Aluminum (Al)	ug/L	330	5.0	5215135	140	5215135	71	5.0	5215135
Total Antimony (Sb)	ug/L	ND	1.0	5215135	ND	5215135	ND	1.0	5215135
Total Arsenic (As)	ug/L	3.1	1.0	5215135	ND	5215135	ND	1.0	5215135
Total Barium (Ba)	ug/L	6.1	1.0	5215135	2.8	5215135	4.1	1.0	5215135
Total Beryllium (Be)	ug/L	ND	1.0	5215135	ND	5215135	ND	1.0	5215135
Total Bismuth (Bi)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
N/A = Not Applicable									
ND = Not detected									
(1) Elevated reporting limit due to sample matrix.									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF017			FIF018		FIF019		
Sampling Date		2017/10/10 15:05			2017/10/10 14:31		2017/10/10 15:50		
COC Number		632094-01-01			632094-01-01		632094-01-01		
	UNITS	SW-1	RDL	QC Batch	SW-2	QC Batch	SW-3	RDL	QC Batch
Total Boron (B)	ug/L	ND	50	5215135	ND	5215135	ND	50	5215135
Total Cadmium (Cd)	ug/L	0.018	0.010	5215135	0.012	5215135	ND	0.010	5215135
Total Calcium (Ca)	ug/L	1100	100	5215135	430	5215135	580	100	5215135
Total Chromium (Cr)	ug/L	ND	1.0	5215135	ND	5215135	ND	1.0	5215135
Total Cobalt (Co)	ug/L	ND	0.40	5215135	ND	5215135	ND	0.40	5215135
Total Copper (Cu)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
Total Iron (Fe)	ug/L	380	50	5215135	230	5215135	ND	50	5215135
Total Lead (Pb)	ug/L	ND	0.50	5215135	ND	5215135	ND	0.50	5215135
Total Magnesium (Mg)	ug/L	450	100	5215135	270	5215135	220	100	5215135
Total Manganese (Mn)	ug/L	56	2.0	5215135	98	5215135	18	2.0	5215135
Total Molybdenum (Mo)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
Total Nickel (Ni)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
Total Phosphorus (P)	ug/L	ND	100	5215135	ND	5215135	ND	100	5215135
Total Potassium (K)	ug/L	320	100	5215135	230	5215135	230	100	5215135
Total Selenium (Se)	ug/L	ND	1.0	5215135	ND	5215135	ND	1.0	5215135
Total Silver (Ag)	ug/L	ND	0.10	5215135	ND	5215135	ND	0.10	5215135
Total Sodium (Na)	ug/L	2700	100	5215135	2000	5215135	1900	100	5215135
Total Strontium (Sr)	ug/L	10	2.0	5215135	4.1	5215135	6.4	2.0	5215135
Total Thallium (Tl)	ug/L	ND	0.10	5215135	ND	5215135	ND	0.10	5215135
Total Tin (Sn)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
Total Titanium (Ti)	ug/L	4.0	2.0	5215135	2.9	5215135	ND	2.0	5215135
Total Uranium (U)	ug/L	ND	0.10	5215135	ND	5215135	ND	0.10	5215135
Total Vanadium (V)	ug/L	ND	2.0	5215135	ND	5215135	ND	2.0	5215135
Total Zinc (Zn)	ug/L	ND	5.0	5215135	ND	5215135	ND	5.0	5215135
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF020		FIF021			FIF022		
Sampling Date		2017/10/10 16:19		2017/10/10 16:39			2017/10/10 10:40		
COC Number		632094-01-01		632094-01-01			632094-01-01		
	UNITS	SW-4	QC Batch	SW-5	RDL	QC Batch	SW-6	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.530	5213207	0.120	N/A	5213207	0.140	N/A	5213207
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	5213214	ND	1.0	5213214	ND	1.0	5213214
Calculated TDS	mg/L	40	5213212	11	1.0	5213212	13	1.0	5213212
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	5213214	ND	1.0	5213214	ND	1.0	5213214
Cation Sum	me/L	0.560	5213207	0.210	N/A	5213207	0.250	N/A	5213207
Hardness (CaCO ₃)	mg/L	14	5213205	3.6	1.0	5213205	4.0	1.0	5213205
Ion Balance (% Difference)	%	2.75	5213206	27.3	N/A	5213206	28.2	N/A	5213206
Langelier Index (@ 20C)	N/A	NC	5213210	NC		5213210	NC		5213210
Langelier Index (@ 4C)	N/A	NC	5213211	NC		5213211	NC		5213211
Nitrate (N)	mg/L	0.065	5213208	ND	0.050	5213208	ND	0.050	5213208
Saturation pH (@ 20C)	N/A	NC	5213210	NC		5213210	NC		5213210
Saturation pH (@ 4C)	N/A	NC	5213211	NC		5213211	NC		5213211
Inorganics									
Total Alkalinity (Total as CaCO ₃)	mg/L	ND	5215638	ND	5.0	5215638	ND	5.0	5215638
Dissolved Chloride (Cl)	mg/L	4.7	5215640	4.2	1.0	5215640	5.0	1.0	5215640
Colour	TCU	19	5215649	44	5.0	5215649	61 (1)	25	5215649
Nitrate + Nitrite (N)	mg/L	0.065	5215656	ND	0.050	5215656	ND	0.050	5215656
Nitrite (N)	mg/L	ND	5215660	ND	0.010	5215660	ND	0.010	5215660
Nitrogen (Ammonia Nitrogen)	mg/L	0.054	5217622	ND	0.050	5217622	ND	0.050	5217622
Total Organic Carbon (C)	mg/L	6.7	5222633	6.0	0.50	5222633	9.8	0.50	5222633
Orthophosphate (P)	mg/L	0.016	5215653	0.013	0.010	5215653	ND	0.010	5215653
pH	pH	4.31	5217403	5.39	N/A	5217401	5.26	N/A	5217403
Reactive Silica (SiO ₂)	mg/L	4.4	5215646	2.1	0.50	5215646	2.6	0.50	5215646
Dissolved Sulphate (SO ₄)	mg/L	19	5215643	ND	2.0	5215643	ND	2.0	5215643
Turbidity	NTU	6.3	5217419	3.7	0.10	5217423	2.9	0.10	5217419
Conductivity	uS/cm	86	5217404	20	1.0	5217402	26	1.0	5217404
Metals									
Total Aluminum (Al)	ug/L	180	5215135	240	5.0	5215135	250	5.0	5215135
Total Antimony (Sb)	ug/L	ND	5215135	ND	1.0	5215135	ND	1.0	5215135
Total Arsenic (As)	ug/L	190	5215135	49	1.0	5215135	4.5	1.0	5215135
Total Barium (Ba)	ug/L	6.2	5215135	3.7	1.0	5215135	4.8	1.0	5215135
Total Beryllium (Be)	ug/L	ND	5215135	ND	1.0	5215135	ND	1.0	5215135
Total Bismuth (Bi)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
N/A = Not Applicable									
ND = Not detected									
(1) Elevated reporting limit due to sample matrix.									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF020		FIF021			FIF022		
Sampling Date		2017/10/10 16:19		2017/10/10 16:39			2017/10/10 10:40		
COC Number		632094-01-01		632094-01-01			632094-01-01		
	UNITS	SW-4	QC Batch	SW-5	RDL	QC Batch	SW-6	RDL	QC Batch
Total Boron (B)	ug/L	ND	5215135	ND	50	5215135	ND	50	5215135
Total Cadmium (Cd)	ug/L	0.017	5215135	ND	0.010	5215135	0.011	0.010	5215135
Total Calcium (Ca)	ug/L	4700	5215135	860	100	5215135	890	100	5215135
Total Chromium (Cr)	ug/L	ND	5215135	ND	1.0	5215135	ND	1.0	5215135
Total Cobalt (Co)	ug/L	1.6	5215135	0.51	0.40	5215135	ND	0.40	5215135
Total Copper (Cu)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
Total Iron (Fe)	ug/L	2200	5215135	890	50	5215135	580	50	5215135
Total Lead (Pb)	ug/L	0.89	5215135	ND	0.50	5215135	ND	0.50	5215135
Total Magnesium (Mg)	ug/L	600	5215135	350	100	5215135	420	100	5215135
Total Manganese (Mn)	ug/L	530	5215135	110	2.0	5215135	57	2.0	5215135
Total Molybdenum (Mo)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
Total Nickel (Ni)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
Total Phosphorus (P)	ug/L	ND	5215135	ND	100	5215135	ND	100	5215135
Total Potassium (K)	ug/L	620	5215135	400	100	5215135	260	100	5215135
Total Selenium (Se)	ug/L	ND	5215135	ND	1.0	5215135	ND	1.0	5215135
Total Silver (Ag)	ug/L	ND	5215135	ND	0.10	5215135	ND	0.10	5215135
Total Sodium (Na)	ug/L	2900	5215135	2200	100	5215135	3100	100	5215135
Total Strontium (Sr)	ug/L	18	5215135	6.6	2.0	5215135	7.8	2.0	5215135
Total Thallium (Tl)	ug/L	ND	5215135	ND	0.10	5215135	ND	0.10	5215135
Total Tin (Sn)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
Total Titanium (Ti)	ug/L	4.2	5215135	4.4	2.0	5215135	5.2	2.0	5215135
Total Uranium (U)	ug/L	ND	5215135	ND	0.10	5215135	ND	0.10	5215135
Total Vanadium (V)	ug/L	ND	5215135	ND	2.0	5215135	ND	2.0	5215135
Total Zinc (Zn)	ug/L	16	5215135	ND	5.0	5215135	ND	5.0	5215135
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF023		FIF024	FIF025		FIF026		
Sampling Date		2017/10/10 11:36		2017/10/06 14:55	2017/10/06 14:10		2017/10/06 10:35		
COC Number		632094-01-01		632094-01-01	632094-01-01		632094-01-01		
	UNITS	SW-7	QC Batch	SW-8	SW-9	QC Batch	SW-10	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.140	5213207	0.130	0.140	5213207	0.210	N/A	5213207
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	5213214	ND	ND	5213214	ND	1.0	5213214
Calculated TDS	mg/L	14	5213212	11	11	5213212	17	1.0	5213212
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	5213214	ND	ND	5213214	ND	1.0	5213214
Cation Sum	me/L	0.230	5213207	0.210	0.200	5213207	0.310	N/A	5213207
Hardness (CaCO3)	mg/L	5.0	5213205	3.4	3.0	5213205	4.6	1.0	5213205
Ion Balance (% Difference)	%	24.3	5213206	23.5	17.7	5213206	19.2	N/A	5213206
Langelier Index (@ 20C)	N/A	NC	5213210	NC	NC	5213210	NC		5213210
Langelier Index (@ 4C)	N/A	NC	5213211	NC	NC	5213211	NC		5213211
Nitrate (N)	mg/L	ND	5213208	ND	ND	5213208	ND	0.050	5213208
Saturation pH (@ 20C)	N/A	NC	5213210	NC	NC	5213210	NC		5213210
Saturation pH (@ 4C)	N/A	NC	5213211	NC	NC	5213211	NC		5213211
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5215638	ND	ND	5215661	ND	5.0	5215661
Dissolved Chloride (Cl)	mg/L	4.9	5215640	4.8	4.9	5215664	7.4	1.0	5215664
Colour	TCU	37	5215649	44	23	5215677	43	5.0	5215677
Nitrate + Nitrite (N)	mg/L	ND	5215656	ND	ND	5215683	ND	0.050	5215683
Nitrite (N)	mg/L	ND	5215660	ND	ND	5215686	ND	0.010	5215686
Nitrogen (Ammonia Nitrogen)	mg/L	ND	5217622	ND	ND	5217622	ND	0.050	5217622
Total Organic Carbon (C)	mg/L	7.7	5222633	8.3	5.6	5222633	8.8	0.50	5222633
Orthophosphate (P)	mg/L	ND	5215653	ND	ND	5215679	ND	0.010	5215679
pH	pH	5.77	5217403	5.54	6.10	5217401	5.70	N/A	5217401
Reactive Silica (SiO2)	mg/L	3.8	5215646	1.9	1.5	5215672	3.0	0.50	5215672
Dissolved Sulphate (SO4)	mg/L	ND	5215643	ND	ND	5215669	ND	2.0	5215669
Turbidity	NTU	0.86	5217419	0.63	0.87	5217419	0.32	0.10	5217423
Conductivity	uS/cm	25	5217404	24	24	5217402	34	1.0	5217402
Metals									
Total Aluminum (Al)	ug/L	150	5215135	190	130	5215135	170	5.0	5215135
Total Antimony (Sb)	ug/L	ND	5215135	ND	ND	5215135	ND	1.0	5215135
Total Arsenic (As)	ug/L	2.4	5215135	ND	ND	5215135	ND	1.0	5215135
Total Barium (Ba)	ug/L	3.5	5215135	5.5	4.8	5215135	4.7	1.0	5215135
Total Beryllium (Be)	ug/L	ND	5215135	ND	ND	5215135	ND	1.0	5215135
Total Bismuth (Bi)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable ND = Not detected									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF023		FIF024	FIF025		FIF026		
Sampling Date		2017/10/10 11:36		2017/10/06 14:55	2017/10/06 14:10		2017/10/06 10:35		
COC Number		632094-01-01		632094-01-01	632094-01-01		632094-01-01		
	UNITS	SW-7	QC Batch	SW-8	SW-9	QC Batch	SW-10	RDL	QC Batch
Total Boron (B)	ug/L	ND	5215135	ND	ND	5215135	ND	50	5215135
Total Cadmium (Cd)	ug/L	ND	5215135	ND	ND	5215135	ND	0.010	5215135
Total Calcium (Ca)	ug/L	1200	5215135	730	660	5215135	1100	100	5215135
Total Chromium (Cr)	ug/L	1.0	5215135	ND	ND	5215135	ND	1.0	5215135
Total Cobalt (Co)	ug/L	0.78	5215135	ND	ND	5215135	ND	0.40	5215135
Total Copper (Cu)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
Total Iron (Fe)	ug/L	440	5215135	230	170	5215135	340	50	5215135
Total Lead (Pb)	ug/L	ND	5215135	ND	ND	5215135	ND	0.50	5215135
Total Magnesium (Mg)	ug/L	450	5215135	370	330	5215135	480	100	5215135
Total Manganese (Mn)	ug/L	400	5215135	28	28	5215135	64	2.0	5215135
Total Molybdenum (Mo)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
Total Nickel (Ni)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
Total Phosphorus (P)	ug/L	ND	5215135	ND	ND	5215135	ND	100	5215135
Total Potassium (K)	ug/L	100	5215135	310	280	5215135	210	100	5215135
Total Selenium (Se)	ug/L	ND	5215135	ND	ND	5215135	ND	1.0	5215135
Total Silver (Ag)	ug/L	ND	5215135	ND	ND	5215135	ND	0.10	5215135
Total Sodium (Na)	ug/L	2600	5215135	2900	2900	5215135	4500	100	5215135
Total Strontium (Sr)	ug/L	6.6	5215135	6.1	5.5	5215135	8.1	2.0	5215135
Total Thallium (Tl)	ug/L	ND	5215135	ND	ND	5215135	ND	0.10	5215135
Total Tin (Sn)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
Total Titanium (Ti)	ug/L	ND	5215135	2.1	ND	5215135	ND	2.0	5215135
Total Uranium (U)	ug/L	ND	5215135	ND	ND	5215135	ND	0.10	5215135
Total Vanadium (V)	ug/L	ND	5215135	ND	ND	5215135	ND	2.0	5215135
Total Zinc (Zn)	ug/L	ND	5215135	ND	ND	5215135	ND	5.0	5215135

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF027		FIF028			FIF029		
Sampling Date		2017/10/10 13:38		2017/10/06 09:40			2017/10/06 09:15		
COC Number		632094-02-01		632094-02-01			632094-02-01		
	UNITS	SW-11	QC Batch	SW-12	RDL	QC Batch	SW-13	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.880	5213207	0.100	N/A	5213207	0.400	N/A	5213207
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	5213214	ND	1.0	5213214	ND	1.0	5213214
Calculated TDS	mg/L	48	5213212	12	1.0	5213212	28	1.0	5213212
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	5213214	ND	1.0	5213214	ND	1.0	5213214
Cation Sum	me/L	0.790	5213207	0.230	N/A	5213207	0.410	N/A	5213207
Hardness (CaCO ₃)	mg/L	3.8	5213205	4.2	1.0	5213205	3.9	1.0	5213205
Ion Balance (% Difference)	%	5.39	5213206	39.4	N/A	5213206	1.23	N/A	5213206
Langelier Index (@ 20C)	N/A	NC	5213210	NC		5213210	NC		5213210
Langelier Index (@ 4C)	N/A	NC	5213211	NC		5213211	NC		5213211
Nitrate (N)	mg/L	ND	5213208	ND	0.050	5213208	0.19	0.050	5213208
Saturation pH (@ 20C)	N/A	NC	5213210	NC		5213210	NC		5213210
Saturation pH (@ 4C)	N/A	NC	5213211	NC		5213211	NC		5213211
Inorganics									
Total Alkalinity (Total as CaCO ₃)	mg/L	ND	5215661	ND	5.0	5215661	ND	5.0	5215661
Dissolved Chloride (Cl)	mg/L	4.2	5215664	3.6	1.0	5215664	4.6	1.0	5215664
Colour	TCU	93 (1)	5215677	150 (1)	25	5215677	150 (1)	25	5215677
Nitrate + Nitrite (N)	mg/L	ND	5215683	ND	0.050	5215683	0.19	0.050	5215683
Nitrite (N)	mg/L	ND	5215686	ND	0.010	5215686	ND	0.010	5215686
Nitrogen (Ammonia Nitrogen)	mg/L	ND	5217622	ND	0.050	5217622	ND	0.050	5217622
Total Organic Carbon (C)	mg/L	14	5222633	17	0.50	5222633	21	1.0	5222633
Orthophosphate (P)	mg/L	ND	5215679	ND	0.010	5215679	ND	0.010	5215679
pH	pH	3.23 (2)	5217401	5.55	N/A	5217401	3.84 (2)	N/A	5217401
Reactive Silica (SiO ₂)	mg/L	3.0	5215672	3.0	0.50	5215672	4.2	0.50	5215672
Dissolved Sulphate (SO ₄)	mg/L	37	5215669	ND	2.0	5215669	13	2.0	5215669
Turbidity	NTU	1.7	5217423	1.9	0.10	5217423	7.3	0.10	5217419
Conductivity	uS/cm	260	5217402	23	1.0	5217402	97	1.0	5217402
Metals									
Total Aluminum (Al)	ug/L	320	5215135	330	5.0	5215138	310	5.0	5215138
Total Antimony (Sb)	ug/L	ND	5215135	ND	1.0	5215138	ND	1.0	5215138
Total Arsenic (As)	ug/L	ND	5215135	ND	1.0	5215138	1.5	1.0	5215138
Total Barium (Ba)	ug/L	4.0	5215135	5.1	1.0	5215138	4.7	1.0	5215138
Total Beryllium (Be)	ug/L	ND	5215135	ND	1.0	5215138	ND	1.0	5215138
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
N/A = Not Applicable									
ND = Not detected									
(1) Elevated reporting limit due to sample matrix.									
(2) pH: linear range exceedance. Extended linearity confirmed.									

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FIF027		FIF028			FIF029		
Sampling Date		2017/10/10 13:38		2017/10/06 09:40			2017/10/06 09:15		
COC Number		632094-02-01		632094-02-01			632094-02-01		
	UNITS	SW-11	QC Batch	SW-12	RDL	QC Batch	SW-13	RDL	QC Batch
Total Bismuth (Bi)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Boron (B)	ug/L	ND	5215135	ND	50	5215138	ND	50	5215138
Total Cadmium (Cd)	ug/L	0.014	5215135	0.020	0.010	5215138	0.013	0.010	5215138
Total Calcium (Ca)	ug/L	860	5215135	840	100	5215138	730	100	5215138
Total Chromium (Cr)	ug/L	ND	5215135	ND	1.0	5215138	ND	1.0	5215138
Total Cobalt (Co)	ug/L	ND	5215135	0.46	0.40	5215138	0.53	0.40	5215138
Total Copper (Cu)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Iron (Fe)	ug/L	370	5215135	1200	50	5215138	2300	50	5215138
Total Lead (Pb)	ug/L	ND	5215135	0.59	0.50	5215138	ND	0.50	5215138
Total Magnesium (Mg)	ug/L	410	5215135	510	100	5215138	510	100	5215138
Total Manganese (Mn)	ug/L	51	5215135	91	2.0	5215138	84	2.0	5215138
Total Molybdenum (Mo)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Nickel (Ni)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Phosphorus (P)	ug/L	ND	5215135	ND	100	5215138	ND	100	5215138
Total Potassium (K)	ug/L	200	5215135	260	100	5215138	150	100	5215138
Total Selenium (Se)	ug/L	ND	5215135	ND	1.0	5215138	ND	1.0	5215138
Total Silver (Ag)	ug/L	ND	5215135	ND	0.10	5215138	ND	0.10	5215138
Total Sodium (Na)	ug/L	2400	5215135	2100	100	5215138	2400	100	5215138
Total Strontium (Sr)	ug/L	8.5	5215135	8.5	2.0	5215138	7.3	2.0	5215138
Total Thallium (Tl)	ug/L	ND	5215135	ND	0.10	5215138	ND	0.10	5215138
Total Tin (Sn)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Titanium (Ti)	ug/L	4.0	5215135	4.1	2.0	5215138	4.7	2.0	5215138
Total Uranium (U)	ug/L	ND	5215135	ND	0.10	5215138	ND	0.10	5215138
Total Vanadium (V)	ug/L	ND	5215135	ND	2.0	5215138	ND	2.0	5215138
Total Zinc (Zn)	ug/L	ND	5215135	ND	5.0	5215138	5.6	5.0	5215138
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		FIF017	FIF018	FIF019	FIF020	FIF021	FIF022		
Sampling Date		2017/10/10 15:05	2017/10/10 14:31	2017/10/10 15:50	2017/10/10 16:19	2017/10/10 16:39	2017/10/10 10:40		
COC Number		632094-01-01	632094-01-01	632094-01-01	632094-01-01	632094-01-01	632094-01-01		
	UNITS	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	ND	ND	ND	0.028	0.020	ND	0.013	5213676
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

Maxxam ID		FIF023	FIF024	FIF025	FIF026	FIF027	FIF028		
Sampling Date		2017/10/10 11:36	2017/10/06 14:55	2017/10/06 14:10	2017/10/06 10:35	2017/10/10 13:38	2017/10/06 09:40		
COC Number		632094-01-01	632094-01-01	632094-01-01	632094-01-01	632094-02-01	632094-02-01		
	UNITS	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	0.013	5213676
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

Maxxam ID		FIF029		
Sampling Date		2017/10/06 09:15		
COC Number		632094-02-01		
	UNITS	SW-13	RDL	QC Batch
Metals				
Total Mercury (Hg)	ug/L	ND	0.013	5213676
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected				

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C
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Sample FIF017 [SW-1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF018 [SW-2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF019 [SW-3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF021 [SW-5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF022 [SW-6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF023 [SW-7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF024 [SW-8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF025 [SW-9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF026 [SW-10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF027 [SW-11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FIF028 [SW-12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5213676	ARS	Matrix Spike [FIF017-04]	Total Mercury (Hg)	2017/10/17		103	%	80 - 120
5213676	ARS	Spiked Blank	Total Mercury (Hg)	2017/10/17		103	%	80 - 120
5213676	ARS	Method Blank	Total Mercury (Hg)	2017/10/17	ND, RDL=0.013		ug/L	
5213676	ARS	RPD	Total Mercury (Hg)	2017/10/17	NC		%	20
5215135	BAN	Matrix Spike	Total Aluminum (Al)	2017/10/18		100	%	80 - 120
			Total Antimony (Sb)	2017/10/18		102	%	80 - 120
			Total Arsenic (As)	2017/10/18		100	%	80 - 120
			Total Barium (Ba)	2017/10/18		97	%	80 - 120
			Total Beryllium (Be)	2017/10/18		97	%	80 - 120
			Total Bismuth (Bi)	2017/10/18		105	%	80 - 120
			Total Boron (B)	2017/10/18		100	%	80 - 120
			Total Cadmium (Cd)	2017/10/18		102	%	80 - 120
			Total Calcium (Ca)	2017/10/18		107	%	80 - 120
			Total Chromium (Cr)	2017/10/18		101	%	80 - 120
			Total Cobalt (Co)	2017/10/18		102	%	80 - 120
			Total Copper (Cu)	2017/10/18		100	%	80 - 120
			Total Iron (Fe)	2017/10/18		105	%	80 - 120
			Total Lead (Pb)	2017/10/18		99	%	80 - 120
			Total Magnesium (Mg)	2017/10/18		103	%	80 - 120
			Total Manganese (Mn)	2017/10/18		103	%	80 - 120
			Total Molybdenum (Mo)	2017/10/18		106	%	80 - 120
			Total Nickel (Ni)	2017/10/18		102	%	80 - 120
			Total Phosphorus (P)	2017/10/18		104	%	80 - 120
			Total Potassium (K)	2017/10/18		105	%	80 - 120
			Total Selenium (Se)	2017/10/18		101	%	80 - 120
			Total Silver (Ag)	2017/10/18		102	%	80 - 120
			Total Sodium (Na)	2017/10/18		102	%	80 - 120
			Total Strontium (Sr)	2017/10/18		104	%	80 - 120
			Total Thallium (Tl)	2017/10/18		105	%	80 - 120
			Total Tin (Sn)	2017/10/18		106	%	80 - 120
			Total Titanium (Ti)	2017/10/18		104	%	80 - 120
			Total Uranium (U)	2017/10/18		107	%	80 - 120
			Total Vanadium (V)	2017/10/18		100	%	80 - 120
			Total Zinc (Zn)	2017/10/18		103	%	80 - 120
5215135	BAN	Spiked Blank	Total Aluminum (Al)	2017/10/17		100	%	80 - 120
			Total Antimony (Sb)	2017/10/17		97	%	80 - 120
			Total Arsenic (As)	2017/10/17		98	%	80 - 120
			Total Barium (Ba)	2017/10/17		97	%	80 - 120
			Total Beryllium (Be)	2017/10/17		95	%	80 - 120
			Total Bismuth (Bi)	2017/10/17		102	%	80 - 120
			Total Boron (B)	2017/10/17		101	%	80 - 120
			Total Cadmium (Cd)	2017/10/17		100	%	80 - 120
			Total Calcium (Ca)	2017/10/17		104	%	80 - 120
			Total Chromium (Cr)	2017/10/17		99	%	80 - 120
			Total Cobalt (Co)	2017/10/17		101	%	80 - 120
			Total Copper (Cu)	2017/10/17		98	%	80 - 120
			Total Iron (Fe)	2017/10/17		103	%	80 - 120
			Total Lead (Pb)	2017/10/17		97	%	80 - 120
			Total Magnesium (Mg)	2017/10/17		102	%	80 - 120
			Total Manganese (Mn)	2017/10/17		101	%	80 - 120
			Total Molybdenum (Mo)	2017/10/17		103	%	80 - 120
			Total Nickel (Ni)	2017/10/17		101	%	80 - 120
			Total Phosphorus (P)	2017/10/17		102	%	80 - 120
			Total Potassium (K)	2017/10/17		104	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Selenium (Se)	2017/10/17		100	%	80 - 120
			Total Silver (Ag)	2017/10/17		98	%	80 - 120
			Total Sodium (Na)	2017/10/17		99	%	80 - 120
			Total Strontium (Sr)	2017/10/17		102	%	80 - 120
			Total Thallium (Tl)	2017/10/17		103	%	80 - 120
			Total Tin (Sn)	2017/10/17		101	%	80 - 120
			Total Titanium (Ti)	2017/10/17		102	%	80 - 120
			Total Uranium (U)	2017/10/17		105	%	80 - 120
			Total Vanadium (V)	2017/10/17		98	%	80 - 120
			Total Zinc (Zn)	2017/10/17		100	%	80 - 120
5215135	BAN	Method Blank	Total Aluminum (Al)	2017/10/17	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Boron (B)	2017/10/17	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2017/10/17	ND, RDL=0.010		ug/L	
			Total Calcium (Ca)	2017/10/17	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2017/10/17	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2017/10/17	ND, RDL=50		ug/L	
			Total Lead (Pb)	2017/10/17	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2017/10/17	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2017/10/17	ND, RDL=100		ug/L	
			Total Potassium (K)	2017/10/17	ND, RDL=100		ug/L	
			Total Selenium (Se)	2017/10/17	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2017/10/17	ND, RDL=0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Sodium (Na)	2017/10/17	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2017/10/17	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2017/10/17	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2017/10/17	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2017/10/17	ND, RDL=5.0		ug/L	
5215135	BAN	RPD	Total Aluminum (Al)	2017/10/18	NC		%	20
			Total Antimony (Sb)	2017/10/18	NC		%	20
			Total Arsenic (As)	2017/10/18	0.98		%	20
			Total Barium (Ba)	2017/10/18	0.19		%	20
			Total Boron (B)	2017/10/18	NC		%	20
			Total Cadmium (Cd)	2017/10/18	NC		%	20
			Total Calcium (Ca)	2017/10/18	0.0032		%	20
			Total Chromium (Cr)	2017/10/18	3.2		%	20
			Total Copper (Cu)	2017/10/18	1.2		%	20
			Total Iron (Fe)	2017/10/18	NC		%	20
			Total Lead (Pb)	2017/10/18	NC		%	20
			Total Magnesium (Mg)	2017/10/18	0.85		%	20
			Total Manganese (Mn)	2017/10/18	NC		%	20
			Total Potassium (K)	2017/10/18	0.086		%	20
			Total Selenium (Se)	2017/10/18	NC		%	20
			Total Sodium (Na)	2017/10/18	0.22		%	20
			Total Uranium (U)	2017/10/18	0.31		%	20
			Total Zinc (Zn)	2017/10/18	0.051		%	20
5215138	BAN	Matrix Spike	Total Aluminum (Al)	2017/10/18		101	%	80 - 120
			Total Antimony (Sb)	2017/10/18		101	%	80 - 120
			Total Arsenic (As)	2017/10/18		100	%	80 - 120
			Total Barium (Ba)	2017/10/18		98	%	80 - 120
			Total Beryllium (Be)	2017/10/18		97	%	80 - 120
			Total Bismuth (Bi)	2017/10/18		105	%	80 - 120
			Total Boron (B)	2017/10/18		102	%	80 - 120
			Total Cadmium (Cd)	2017/10/18		104	%	80 - 120
			Total Calcium (Ca)	2017/10/18		107	%	80 - 120
			Total Chromium (Cr)	2017/10/18		102	%	80 - 120
			Total Cobalt (Co)	2017/10/18		103	%	80 - 120
			Total Copper (Cu)	2017/10/18		101	%	80 - 120
			Total Iron (Fe)	2017/10/18		104	%	80 - 120
			Total Lead (Pb)	2017/10/18		99	%	80 - 120
			Total Magnesium (Mg)	2017/10/18		103	%	80 - 120
			Total Manganese (Mn)	2017/10/18		102	%	80 - 120
			Total Molybdenum (Mo)	2017/10/18		106	%	80 - 120
			Total Nickel (Ni)	2017/10/18		102	%	80 - 120
			Total Phosphorus (P)	2017/10/18		105	%	80 - 120
			Total Potassium (K)	2017/10/18		105	%	80 - 120
			Total Selenium (Se)	2017/10/18		102	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2017/10/18		103	%	80 - 120
			Total Sodium (Na)	2017/10/18		NC	%	80 - 120
			Total Strontium (Sr)	2017/10/18		104	%	80 - 120
			Total Thallium (Tl)	2017/10/18		105	%	80 - 120
			Total Tin (Sn)	2017/10/18		105	%	80 - 120
			Total Titanium (Ti)	2017/10/18		104	%	80 - 120
			Total Uranium (U)	2017/10/18		108	%	80 - 120
			Total Vanadium (V)	2017/10/18		101	%	80 - 120
			Total Zinc (Zn)	2017/10/18		102	%	80 - 120
5215138	BAN	Spiked Blank	Total Aluminum (Al)	2017/10/18		99	%	80 - 120
			Total Antimony (Sb)	2017/10/18		98	%	80 - 120
			Total Arsenic (As)	2017/10/18		96	%	80 - 120
			Total Barium (Ba)	2017/10/18		95	%	80 - 120
			Total Beryllium (Be)	2017/10/18		95	%	80 - 120
			Total Bismuth (Bi)	2017/10/18		103	%	80 - 120
			Total Boron (B)	2017/10/18		98	%	80 - 120
			Total Cadmium (Cd)	2017/10/18		99	%	80 - 120
			Total Calcium (Ca)	2017/10/18		103	%	80 - 120
			Total Chromium (Cr)	2017/10/18		100	%	80 - 120
			Total Cobalt (Co)	2017/10/18		100	%	80 - 120
			Total Copper (Cu)	2017/10/18		99	%	80 - 120
			Total Iron (Fe)	2017/10/18		104	%	80 - 120
			Total Lead (Pb)	2017/10/18		97	%	80 - 120
			Total Magnesium (Mg)	2017/10/18		100	%	80 - 120
			Total Manganese (Mn)	2017/10/18		101	%	80 - 120
			Total Molybdenum (Mo)	2017/10/18		102	%	80 - 120
			Total Nickel (Ni)	2017/10/18		100	%	80 - 120
			Total Phosphorus (P)	2017/10/18		102	%	80 - 120
			Total Potassium (K)	2017/10/18		103	%	80 - 120
			Total Selenium (Se)	2017/10/18		100	%	80 - 120
			Total Silver (Ag)	2017/10/18		98	%	80 - 120
			Total Sodium (Na)	2017/10/18		96	%	80 - 120
			Total Strontium (Sr)	2017/10/18		101	%	80 - 120
			Total Thallium (Tl)	2017/10/18		103	%	80 - 120
			Total Tin (Sn)	2017/10/18		101	%	80 - 120
			Total Titanium (Ti)	2017/10/18		102	%	80 - 120
			Total Uranium (U)	2017/10/18		105	%	80 - 120
			Total Vanadium (V)	2017/10/18		98	%	80 - 120
			Total Zinc (Zn)	2017/10/18		99	%	80 - 120
5215138	BAN	Method Blank	Total Aluminum (Al)	2017/10/18	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Boron (B)	2017/10/18	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2017/10/18	ND, RDL=0.010		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Calcium (Ca)	2017/10/18	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2017/10/18	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2017/10/18	ND, RDL=50		ug/L	
			Total Lead (Pb)	2017/10/18	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2017/10/18	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2017/10/18	ND, RDL=100		ug/L	
			Total Potassium (K)	2017/10/18	ND, RDL=100		ug/L	
			Total Selenium (Se)	2017/10/18	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2017/10/18	ND, RDL=0.10		ug/L	
			Total Sodium (Na)	2017/10/18	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2017/10/18	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2017/10/18	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2017/10/18	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2017/10/18	ND, RDL=5.0		ug/L	
5215138	BAN	RPD	Total Arsenic (As)	2017/10/18	8.0		%	20
			Total Lead (Pb)	2017/10/18	0.65		%	20
			Total Uranium (U)	2017/10/18	2.3		%	20
5215638	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2017/10/18		110	%	80 - 120
5215638	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/10/18		110	%	80 - 120
5215638	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2017/10/18	ND, RDL=5.0		mg/L	
5215638	MCN	RPD	Total Alkalinity (Total as CaCO3)	2017/10/18	1.3		%	25
5215640	MCN	Matrix Spike	Dissolved Chloride (Cl)	2017/10/19		100	%	80 - 120
5215640	MCN	QC Standard	Dissolved Chloride (Cl)	2017/10/19		107	%	80 - 120
5215640	MCN	Spiked Blank	Dissolved Chloride (Cl)	2017/10/19		102	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5215640	MCN	Method Blank	Dissolved Chloride (Cl)	2017/10/19	ND, RDL=1.0		mg/L	
5215640	MCN	RPD	Dissolved Chloride (Cl)	2017/10/19	NC		%	25
5215643	MCN	Matrix Spike	Dissolved Sulphate (SO4)	2017/10/19		95	%	80 - 120
5215643	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2017/10/19		96	%	80 - 120
5215643	MCN	Method Blank	Dissolved Sulphate (SO4)	2017/10/19	ND, RDL=2.0		mg/L	
5215643	MCN	RPD	Dissolved Sulphate (SO4)	2017/10/19	1.1		%	25
5215646	MCN	Matrix Spike	Reactive Silica (SiO2)	2017/10/19		100	%	80 - 120
5215646	MCN	Spiked Blank	Reactive Silica (SiO2)	2017/10/19		98	%	80 - 120
5215646	MCN	Method Blank	Reactive Silica (SiO2)	2017/10/19	ND, RDL=0.50		mg/L	
5215646	MCN	RPD	Reactive Silica (SiO2)	2017/10/19	1.3		%	25
5215649	MCN	Spiked Blank	Colour	2017/10/18		93	%	80 - 120
5215649	MCN	Method Blank	Colour	2017/10/18	ND, RDL=5.0		TCU	
5215649	MCN	RPD	Colour	2017/10/18	NC		%	20
5215653	MCN	Matrix Spike	Orthophosphate (P)	2017/10/18		92	%	80 - 120
5215653	MCN	Spiked Blank	Orthophosphate (P)	2017/10/18		96	%	80 - 120
5215653	MCN	Method Blank	Orthophosphate (P)	2017/10/18	ND, RDL=0.010		mg/L	
5215653	MCN	RPD	Orthophosphate (P)	2017/10/18	NC		%	25
5215656	MCN	Matrix Spike	Nitrate + Nitrite (N)	2017/10/18		96	%	80 - 120
5215656	MCN	Spiked Blank	Nitrate + Nitrite (N)	2017/10/18		96	%	80 - 120
5215656	MCN	Method Blank	Nitrate + Nitrite (N)	2017/10/18	ND, RDL=0.050		mg/L	
5215656	MCN	RPD	Nitrate + Nitrite (N)	2017/10/18	4.7		%	25
5215660	MCN	Matrix Spike	Nitrite (N)	2017/10/18		81	%	80 - 120
5215660	MCN	Spiked Blank	Nitrite (N)	2017/10/18		95	%	80 - 120
5215660	MCN	Method Blank	Nitrite (N)	2017/10/18	ND, RDL=0.010		mg/L	
5215660	MCN	RPD	Nitrite (N)	2017/10/18	NC		%	25
5215661	MCN	Matrix Spike [FIF024-01]	Total Alkalinity (Total as CaCO3)	2017/10/19		109	%	80 - 120
5215661	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/10/18		111	%	80 - 120
5215661	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2017/10/18	ND, RDL=5.0		mg/L	
5215661	MCN	RPD [FIF024-01]	Total Alkalinity (Total as CaCO3)	2017/10/19	NC		%	25
5215664	MCN	Matrix Spike [FIF024-01]	Dissolved Chloride (Cl)	2017/10/19		100	%	80 - 120
5215664	MCN	QC Standard	Dissolved Chloride (Cl)	2017/10/19		106	%	80 - 120
5215664	MCN	Spiked Blank	Dissolved Chloride (Cl)	2017/10/19		104	%	80 - 120
5215664	MCN	Method Blank	Dissolved Chloride (Cl)	2017/10/19	ND, RDL=1.0		mg/L	
5215664	MCN	RPD [FIF024-01]	Dissolved Chloride (Cl)	2017/10/19	12		%	25
5215669	MCN	Matrix Spike [FIF024-01]	Dissolved Sulphate (SO4)	2017/10/19		108	%	80 - 120
5215669	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2017/10/19		98	%	80 - 120
5215669	MCN	Method Blank	Dissolved Sulphate (SO4)	2017/10/19	ND, RDL=2.0		mg/L	
5215669	MCN	RPD [FIF024-01]	Dissolved Sulphate (SO4)	2017/10/19	NC		%	25
5215672	MCN	Matrix Spike [FIF024-01]	Reactive Silica (SiO2)	2017/10/18		95	%	80 - 120
5215672	MCN	Spiked Blank	Reactive Silica (SiO2)	2017/10/19		99	%	80 - 120
5215672	MCN	Method Blank	Reactive Silica (SiO2)	2017/10/19	ND, RDL=0.50		mg/L	
5215672	MCN	RPD [FIF024-01]	Reactive Silica (SiO2)	2017/10/18	2.7		%	25
5215677	MCN	Spiked Blank	Colour	2017/10/18		97	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5215677	MCN	Method Blank	Colour	2017/10/18	ND, RDL=5.0		TCU	
5215677	MCN	RPD [FIF024-01]	Colour	2017/10/18	4.3		%	20
5215679	MCN	Matrix Spike [FIF024-01]	Orthophosphate (P)	2017/10/18		94	%	80 - 120
5215679	MCN	Spiked Blank	Orthophosphate (P)	2017/10/18		97	%	80 - 120
5215679	MCN	Method Blank	Orthophosphate (P)	2017/10/18	ND, RDL=0.010		mg/L	
5215679	MCN	RPD [FIF024-01]	Orthophosphate (P)	2017/10/18	NC		%	25
5215683	MCN	Matrix Spike [FIF024-01]	Nitrate + Nitrite (N)	2017/10/18		95	%	80 - 120
5215683	MCN	Spiked Blank	Nitrate + Nitrite (N)	2017/10/18		98	%	80 - 120
5215683	MCN	Method Blank	Nitrate + Nitrite (N)	2017/10/18	ND, RDL=0.050		mg/L	
5215683	MCN	RPD [FIF024-01]	Nitrate + Nitrite (N)	2017/10/18	NC		%	25
5215686	MCN	Matrix Spike [FIF024-01]	Nitrite (N)	2017/10/18		91	%	80 - 120
5215686	MCN	Spiked Blank	Nitrite (N)	2017/10/18		95	%	80 - 120
5215686	MCN	Method Blank	Nitrite (N)	2017/10/18	ND, RDL=0.010		mg/L	
5215686	MCN	RPD [FIF024-01]	Nitrite (N)	2017/10/18	NC		%	25
5217401	JMV	QC Standard	pH	2017/10/18		100	%	97 - 103
5217401	JMV	RPD [FIF028-01]	pH	2017/10/18	3.2		%	N/A
5217402	JMV	Spiked Blank	Conductivity	2017/10/18		103	%	80 - 120
5217402	JMV	Method Blank	Conductivity	2017/10/18	1.1, RDL=1.0		uS/cm	
5217402	JMV	RPD [FIF028-01]	Conductivity	2017/10/18	0.021		%	25
5217403	JMV	QC Standard	pH	2017/10/18		100	%	97 - 103
5217403	JMV	RPD [FIF020-01]	pH	2017/10/18	4.2		%	N/A
5217404	JMV	Spiked Blank	Conductivity	2017/10/18		106	%	80 - 120
5217404	JMV	Method Blank	Conductivity	2017/10/18	1.3, RDL=1.0		uS/cm	
5217404	JMV	RPD [FIF020-01]	Conductivity	2017/10/18	0.11		%	25
5217419	JMV	QC Standard	Turbidity	2017/10/18		91	%	80 - 120
5217419	JMV	Spiked Blank	Turbidity	2017/10/18		92	%	80 - 120
5217419	JMV	Method Blank	Turbidity	2017/10/18	ND, RDL=0.10		NTU	
5217419	JMV	RPD [FIF024-01]	Turbidity	2017/10/18	9.1		%	20
5217423	JMV	QC Standard	Turbidity	2017/10/18		92	%	80 - 120
5217423	JMV	Spiked Blank	Turbidity	2017/10/18		92	%	80 - 120
5217423	JMV	Method Blank	Turbidity	2017/10/18	ND, RDL=0.10		NTU	
5217423	JMV	RPD	Turbidity	2017/10/18	0.99		%	20
5217622	MCN	Matrix Spike [FIF023-03]	Nitrogen (Ammonia Nitrogen)	2017/10/18		98	%	80 - 120
5217622	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2017/10/18		103	%	80 - 120
5217622	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2017/10/18	ND, RDL=0.050		mg/L	
5217622	MCN	RPD [FIF023-03]	Nitrogen (Ammonia Nitrogen)	2017/10/18	NC		%	20
5222631	SSI	Matrix Spike	Total Organic Carbon (C)	2017/10/20		99	%	80 - 120
5222631	SSI	Spiked Blank	Total Organic Carbon (C)	2017/10/20		103	%	80 - 120
5222631	SSI	Method Blank	Total Organic Carbon (C)	2017/10/20	ND, RDL=0.50		mg/L	
5222631	SSI	RPD	Total Organic Carbon (C)	2017/10/20	0.85		%	20
5222633	SSI	Matrix Spike [FIF020-03]	Total Organic Carbon (C)	2017/10/20		100	%	80 - 120
5222633	SSI	Spiked Blank	Total Organic Carbon (C)	2017/10/20		105	%	80 - 120
5222633	SSI	Method Blank	Total Organic Carbon (C)	2017/10/20	ND, RDL=0.50		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5222633	SSI	RPD [FIF019-03]	Total Organic Carbon (C)	2017/10/20	1.5		%	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.

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)

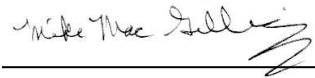
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Kevin MacDonald, Inorganics Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/01/04

Report #: R4928659

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7T2514

Received: 2017/12/22, 14:37

Sample Matrix: Water
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide	13	N/A	2018/01/02	N/A	SM 22 4500-CO2 D
Alkalinity	13	N/A	2018/01/02	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	13	N/A	2018/01/03	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	13	N/A	2018/01/03	ATL SOP 00020	SM 22 2120C m
Conductance - water	13	N/A	2018/01/02	ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	13	N/A	2018/01/02	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL)	13	2018/01/02	2018/01/03	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	13	2017/12/29	2017/12/29	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	13	N/A	2018/01/04	N/A	Auto Calc.
Anion and Cation Sum	13	N/A	2018/01/03	N/A	Auto Calc.
Nitrogen Ammonia - water	13	N/A	2018/01/02	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	13	N/A	2018/01/03	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	13	N/A	2018/01/03	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	13	N/A	2018/01/04	ATL SOP 00018	ASTM D3867-16
pH (1)	13	N/A	2018/01/02	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	13	N/A	2018/01/03	ATL SOP 00021	SM 22 4500-P E m
Sat. pH and Langelier Index (@ 20C)	12	N/A	2018/01/03	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	1	N/A	2018/01/04	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	12	N/A	2018/01/03	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2018/01/04	ATL SOP 00049	Auto Calc.
Reactive Silica	13	N/A	2018/01/03	ATL SOP 00022	EPA 366.0 m
Sulphate	13	N/A	2018/01/03	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	13	N/A	2018/01/04	N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	13	N/A	2018/01/04	ATL SOP 00037	SM 22 5310C m
Turbidity	13	N/A	2018/01/02	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using

Your Project #: 17-191 FMS
Your C.O.C. #: 643303-01-01, 643303-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/01/04

Report #: R4928659

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7T2514

Received: 2017/12/22, 14:37

accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) 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.

(2) 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.

Keri Mackay, Project Manager - Bedford

Email: kmackay@maxxam.ca

Phone# (902)420-0203 Ext:294

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This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG654			FVG655	FVG656		FVG657		
Sampling Date		2017/12/20 13:34			2017/12/20 12:25	2017/12/21 11:05		2017/12/20 12:05		
COC Number		643303-01-01			643303-01-01	643303-01-01		643303-01-01		
	UNITS	SW1	RDL	QC Batch	SW2	SW3	QC Batch	SW4	RDL	QC Batch

Calculated Parameters

Anion Sum	me/L	0.110	N/A	5333082	0.0700	0.150	5333082	0.330	N/A	5333082
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	ND	5333079	7.4	1.0	5333079
Calculated TDS	mg/L	13	1.0	5333087	8.0	14	5333087	26	1.0	5333087
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	ND	5333079	ND	1.0	5333079
Cation Sum	me/L	0.210	N/A	5333082	0.170	0.190	5333082	0.390	N/A	5333082
Hardness (CaCO3)	mg/L	3.7	1.0	5333080	2.8	2.9	5333080	9.8	1.0	5333080
Ion Balance (% Difference)	%	31.3	N/A	5333081	41.7	11.8	5333081	8.33	N/A	5333081
Langelier Index (@ 20C)	N/A	NC		5333085	NC	NC	5333085	-3.69		5333085
Langelier Index (@ 4C)	N/A	NC		5333086	NC	NC	5333086	-3.94		5333086
Nitrate (N)	mg/L	0.081	0.050	5333083	ND	ND	5333083	0.081	0.050	5333083
Saturation pH (@ 20C)	N/A	NC		5333085	NC	NC	5333085	9.93		5333085
Saturation pH (@ 4C)	N/A	NC		5333086	NC	NC	5333086	10.2		5333086

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	5334802	ND	ND	5334802	7.4	5.0	5334802
Dissolved Chloride (Cl)	mg/L	3.7	1.0	5334807	2.5	3.7	5334807	3.8	1.0	5334807
Colour	TCU	63 (1)	25	5334835	30	ND	5334835	45	5.0	5334835
Nitrate + Nitrite (N)	mg/L	0.081	0.050	5334865	ND	ND	5334865	0.081	0.050	5334865
Nitrite (N)	mg/L	ND	0.010	5334867	ND	ND	5334867	ND	0.010	5334867
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	5334977	ND	ND	5334981	0.12	0.050	5334981
Total Organic Carbon (C)	mg/L	7.7	0.50	5339637	5.1	1.8	5339637	5.2	0.50	5339637
Orthophosphate (P)	mg/L	ND	0.010	5334837	ND	ND	5334837	0.017	0.010	5334837
pH	pH	4.91	N/A	5336497	6.01	5.74	5336497	6.24	N/A	5336500
Reactive Silica (SiO2)	mg/L	4.6	0.50	5334830	2.2	3.9	5334830	4.8	0.50	5334830
Dissolved Sulphate (SO4)	mg/L	ND	2.0	5334811	ND	2.3	5334811	3.5	2.0	5334811
Turbidity	NTU	0.34	0.10	5336624	0.62	0.22	5336624	3.8	0.10	5336624
Conductivity	uS/cm	35	1.0	5336498	22	26	5336498	44	1.0	5336501

Metals

Total Aluminum (Al)	ug/L	200	5.0	5334503	130	58	5334503	180	5.0	5334503
Total Antimony (Sb)	ug/L	ND	1.0	5334503	ND	ND	5334503	ND	1.0	5334503
Total Arsenic (As)	ug/L	1.6	1.0	5334503	ND	ND	5334503	130	1.0	5334503
Total Barium (Ba)	ug/L	4.9	1.0	5334503	3.1	4.8	5334503	4.7	1.0	5334503
Total Beryllium (Be)	ug/L	ND	1.0	5334503	ND	ND	5334503	ND	1.0	5334503
Total Bismuth (Bi)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503

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

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG654			FVG655			FVG656			FVG657		
Sampling Date		2017/12/20 13:34			2017/12/20 12:25			2017/12/21 11:05			2017/12/20 12:05		
COC Number		643303-01-01			643303-01-01			643303-01-01			643303-01-01		
	UNITS	SW1	RDL	QC Batch	SW2	SW3	QC Batch	SW4	RDL	QC Batch			
Total Boron (B)	ug/L	ND	50	5334503	ND	ND	5334503	ND	50	5334503			
Total Cadmium (Cd)	ug/L	0.017	0.010	5334503	ND	0.013	5334503	0.020	0.010	5334503			
Total Calcium (Ca)	ug/L	770	100	5334503	560	660	5334503	3100	100	5334503			
Total Chromium (Cr)	ug/L	ND	1.0	5334503	ND	2.1	5334503	ND	1.0	5334503			
Total Cobalt (Co)	ug/L	ND	0.40	5334503	ND	ND	5334503	1.2	0.40	5334503			
Total Copper (Cu)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503			
Total Iron (Fe)	ug/L	170	50	5334503	140	ND	5334503	1800	50	5334503			
Total Lead (Pb)	ug/L	ND	0.50	5334503	ND	ND	5334503	ND	0.50	5334503			
Total Magnesium (Mg)	ug/L	420	100	5334503	340	310	5334503	500	100	5334503			
Total Manganese (Mn)	ug/L	57	2.0	5334503	29	16	5334503	360	2.0	5334503			
Total Molybdenum (Mo)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503			
Total Nickel (Ni)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503			
Total Phosphorus (P)	ug/L	ND	100	5334503	ND	ND	5334503	ND	100	5334503			
Total Potassium (K)	ug/L	410	100	5334503	290	380	5334503	400	100	5334503			
Total Selenium (Se)	ug/L	ND	1.0	5334503	ND	ND	5334503	ND	1.0	5334503			
Total Silver (Ag)	ug/L	ND	0.10	5334503	ND	ND	5334503	ND	0.10	5334503			
Total Sodium (Na)	ug/L	2400	100	5334503	2200	2800	5334503	2600	100	5334503			
Total Strontium (Sr)	ug/L	7.8	2.0	5334503	5.8	6.6	5334503	12	2.0	5334503			
Total Thallium (Tl)	ug/L	ND	0.10	5334503	ND	ND	5334503	ND	0.10	5334503			
Total Tin (Sn)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503			
Total Titanium (Ti)	ug/L	2.3	2.0	5334503	2.3	ND	5334503	2.3	2.0	5334503			
Total Uranium (U)	ug/L	ND	0.10	5334503	ND	ND	5334503	ND	0.10	5334503			
Total Vanadium (V)	ug/L	ND	2.0	5334503	ND	ND	5334503	ND	2.0	5334503			
Total Zinc (Zn)	ug/L	ND	5.0	5334503	ND	ND	5334503	ND	5.0	5334503			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 ND = Not detected

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG658			FVG659			FVG660		
Sampling Date		2017/12/20 14:35			2017/12/21 15:11			2017/12/21 14:46		
COC Number		643303-01-01			643303-01-01			643303-01-01		
	UNITS	SW5	RDL	QC Batch	SW6	RDL	QC Batch	SW7	RDL	QC Batch

Calculated Parameters

Anion Sum	me/L	0.0900	N/A	5333082	0.140	N/A	5333082	0.170	N/A	5333082
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	1.0	5333079	ND	1.0	5333079
Calculated TDS	mg/L	10	1.0	5333087	13	1.0	5333087	15	1.0	5333087
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	1.0	5333079	ND	1.0	5333079
Cation Sum	me/L	0.180	N/A	5333082	0.220	N/A	5333082	0.200	N/A	5333082
Hardness (CaCO3)	mg/L	3.0	1.0	5333080	4.0	1.0	5333080	4.0	1.0	5333080
Ion Balance (% Difference)	%	33.3	N/A	5333081	22.2	N/A	5333081	8.11	N/A	5333081
Langelier Index (@ 20C)	N/A	NC		5333085	NC		5333085	NC		5333085
Langelier Index (@ 4C)	N/A	NC		5333086	NC		5333086	NC		5333086
Nitrate (N)	mg/L	ND	0.050	5333083	ND	0.050	5333083	ND	0.050	5333083
Saturation pH (@ 20C)	N/A	NC		5333085	NC		5333085	NC		5333085
Saturation pH (@ 4C)	N/A	NC		5333086	NC		5333086	NC		5333086

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	5334802	ND	5.0	5334802	ND	5.0	5334802
Dissolved Chloride (Cl)	mg/L	3.4	1.0	5334807	4.8	1.0	5334807	4.4	1.0	5334807
Colour	TCU	41	5.0	5334835	83 (1)	25	5334835	26	5.0	5334835
Nitrate + Nitrite (N)	mg/L	ND	0.050	5334865	ND	0.050	5334865	ND	0.050	5334865
Nitrite (N)	mg/L	ND	0.010	5334867	ND	0.010	5334867	ND	0.010	5334867
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	5334981	ND	0.050	5334981	ND	0.050	5334981
Total Organic Carbon (C)	mg/L	6.1	0.50	5339637	10 (1)	5.0	5339637	5.9	0.50	5339637
Orthophosphate (P)	mg/L	ND	0.010	5334837	ND	0.010	5334837	ND	0.010	5334837
pH	pH	5.23	N/A	5336497	5.89	N/A	5336497	5.54	N/A	5336497
Reactive Silica (SiO2)	mg/L	2.7	0.50	5334830	3.3	0.50	5334830	3.9	0.50	5334830
Dissolved Sulphate (SO4)	mg/L	ND	2.0	5334811	ND	2.0	5334811	2.2	2.0	5334811
Turbidity	NTU	0.54	0.10	5336624	0.95	0.10	5336624	0.23	0.10	5336624
Conductivity	uS/cm	22	1.0	5336498	30	1.0	5336498	30	1.0	5336498

Metals

Total Aluminum (Al)	ug/L	160	5.0	5334503	300	5.0	5334505	130	5.0	5334503
Total Antimony (Sb)	ug/L	ND	1.0	5334503	ND	1.0	5334505	ND	1.0	5334503
Total Arsenic (As)	ug/L	4.7	1.0	5334503	1.3	1.0	5334505	1.2	1.0	5334503
Total Barium (Ba)	ug/L	3.0	1.0	5334503	6.2	1.0	5334505	2.7	1.0	5334503
Total Beryllium (Be)	ug/L	ND	1.0	5334503	ND	1.0	5334505	ND	1.0	5334503
Total Bismuth (Bi)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG658			FVG659			FVG660		
Sampling Date		2017/12/20 14:35			2017/12/21 15:11			2017/12/21 14:46		
COC Number		643303-01-01			643303-01-01			643303-01-01		
	UNITS	SW5	RDL	QC Batch	SW6	RDL	QC Batch	SW7	RDL	QC Batch
Total Boron (B)	ug/L	ND	50	5334503	ND	50	5334505	ND	50	5334503
Total Cadmium (Cd)	ug/L	0.014	0.010	5334503	0.026	0.010	5334505	ND	0.010	5334503
Total Calcium (Ca)	ug/L	630	100	5334503	870	100	5334505	900	100	5334503
Total Chromium (Cr)	ug/L	ND	1.0	5334503	ND	1.0	5334505	ND	1.0	5334503
Total Cobalt (Co)	ug/L	ND	0.40	5334503	ND	0.40	5334505	ND	0.40	5334503
Total Copper (Cu)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503
Total Iron (Fe)	ug/L	180	50	5334503	310	50	5334505	180	50	5334503
Total Lead (Pb)	ug/L	ND	0.50	5334503	ND	0.50	5334505	ND	0.50	5334503
Total Magnesium (Mg)	ug/L	340	100	5334503	450	100	5334505	430	100	5334503
Total Manganese (Mn)	ug/L	55	2.0	5334503	79	2.0	5334505	92	2.0	5334503
Total Molybdenum (Mo)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503
Total Nickel (Ni)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503
Total Phosphorus (P)	ug/L	ND	100	5334503	ND	100	5334505	ND	100	5334503
Total Potassium (K)	ug/L	290	100	5334503	300	100	5334505	180	100	5334503
Total Selenium (Se)	ug/L	ND	1.0	5334503	ND	1.0	5334505	ND	1.0	5334503
Total Silver (Ag)	ug/L	ND	0.10	5334503	ND	0.10	5334505	ND	0.10	5334503
Total Sodium (Na)	ug/L	2300	100	5334503	2700	100	5334505	2500	100	5334503
Total Strontium (Sr)	ug/L	5.6	2.0	5334503	7.9	2.0	5334505	5.2	2.0	5334503
Total Thallium (Tl)	ug/L	ND	0.10	5334503	ND	0.10	5334505	ND	0.10	5334503
Total Tin (Sn)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503
Total Titanium (Ti)	ug/L	2.2	2.0	5334503	2.8	2.0	5334505	ND	2.0	5334503
Total Uranium (U)	ug/L	ND	0.10	5334503	ND	0.10	5334505	ND	0.10	5334503
Total Vanadium (V)	ug/L	ND	2.0	5334503	ND	2.0	5334505	ND	2.0	5334503
Total Zinc (Zn)	ug/L	ND	5.0	5334503	ND	5.0	5334505	ND	5.0	5334503

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG661			FVG662			FVG663		
Sampling Date		2017/12/21 14:10			2017/12/21 13:20			2017/12/21 12:00		
COC Number		643303-01-01			643303-01-01			643303-01-01		
	UNITS	SW8	RDL	QC Batch	SW9	RDL	QC Batch	SW10	RDL	QC Batch

Calculated Parameters

Anion Sum	me/L	0.120	N/A	5333082	0.130	N/A	5333082	0.130	N/A	5333082
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	1.0	5333079	ND	1.0	5333079
Calculated TDS	mg/L	12	1.0	5333087	12	1.0	5333087	12	1.0	5333087
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	5333079	ND	1.0	5333079	ND	1.0	5333079
Cation Sum	me/L	0.210	N/A	5333082	0.210	N/A	5333082	0.220	N/A	5333082
Hardness (CaCO3)	mg/L	3.7	1.0	5333080	3.5	1.0	5333080	3.5	1.0	5333080
Ion Balance (% Difference)	%	27.3	N/A	5333081	23.5	N/A	5333081	25.7	N/A	5333081
Langelier Index (@ 20C)	N/A	NC		5333085	NC		5333085	NC		5333085
Langelier Index (@ 4C)	N/A	NC		5333086	NC		5333086	NC		5333086
Nitrate (N)	mg/L	ND	0.050	5333083	ND	0.050	5333083	ND	0.050	5333083
Saturation pH (@ 20C)	N/A	NC		5333085	NC		5333085	NC		5333085
Saturation pH (@ 4C)	N/A	NC		5333086	NC		5333086	NC		5333086

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	5334802	ND	5.0	5334802	ND	5.0	5334802
Dissolved Chloride (Cl)	mg/L	4.4	1.0	5334807	4.8	1.0	5334807	4.7	1.0	5334807
Colour	TCU	60 (1)	25	5334835	48 (1)	10	5334835	55 (1)	25	5334835
Nitrate + Nitrite (N)	mg/L	ND	0.050	5334865	ND	0.050	5334865	ND	0.050	5334865
Nitrite (N)	mg/L	ND	0.010	5334867	ND	0.010	5334867	ND	0.010	5334867
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	5334981	ND	0.050	5334981	ND	0.050	5334981
Total Organic Carbon (C)	mg/L	8.0	0.50	5339637	7.6	0.50	5339637	7.3	0.50	5339637
Orthophosphate (P)	mg/L	ND	0.010	5334837	ND	0.010	5334837	ND	0.010	5334837
pH	pH	5.75	N/A	5336497	5.62	N/A	5336497	5.48	N/A	5336497
Reactive Silica (SiO2)	mg/L	3.2	0.50	5334830	2.8	0.50	5334830	2.7	0.50	5334830
Dissolved Sulphate (SO4)	mg/L	ND	2.0	5334811	ND	2.0	5334811	ND	2.0	5334811
Turbidity	NTU	0.53	0.10	5336624	0.68	0.10	5336619	3.1	0.10	5336624
Conductivity	uS/cm	26	1.0	5336498	26	1.0	5336498	27	1.0	5336498

Metals

Total Aluminum (Al)	ug/L	240	5.0	5334505	230	5.0	5334505	360	5.0	5334505
Total Antimony (Sb)	ug/L	ND	1.0	5334505	ND	1.0	5334505	ND	1.0	5334505
Total Arsenic (As)	ug/L	ND	1.0	5334505	ND	1.0	5334505	ND	1.0	5334505
Total Barium (Ba)	ug/L	6.3	1.0	5334505	6.1	1.0	5334505	7.3	1.0	5334505
Total Beryllium (Be)	ug/L	ND	1.0	5334505	ND	1.0	5334505	ND	1.0	5334505
Total Bismuth (Bi)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG661			FVG662			FVG663		
Sampling Date		2017/12/21 14:10			2017/12/21 13:20			2017/12/21 12:00		
COC Number		643303-01-01			643303-01-01			643303-01-01		
	UNITS	SW8	RDL	QC Batch	SW9	RDL	QC Batch	SW10	RDL	QC Batch
Total Boron (B)	ug/L	ND	50	5334505	ND	50	5334505	ND	50	5334505
Total Cadmium (Cd)	ug/L	0.022	0.010	5334505	0.019	0.010	5334505	0.029	0.010	5334505
Total Calcium (Ca)	ug/L	770	100	5334505	740	100	5334505	730	100	5334505
Total Chromium (Cr)	ug/L	ND	1.0	5334505	ND	1.0	5334505	ND	1.0	5334505
Total Cobalt (Co)	ug/L	ND	0.40	5334505	ND	0.40	5334505	ND	0.40	5334505
Total Copper (Cu)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505
Total Iron (Fe)	ug/L	230	50	5334505	190	50	5334505	420	50	5334505
Total Lead (Pb)	ug/L	ND	0.50	5334505	ND	0.50	5334505	0.73	0.50	5334505
Total Magnesium (Mg)	ug/L	430	100	5334505	410	100	5334505	410	100	5334505
Total Manganese (Mn)	ug/L	61	2.0	5334505	49	2.0	5334505	99	2.0	5334505
Total Molybdenum (Mo)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505
Total Nickel (Ni)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505
Total Phosphorus (P)	ug/L	ND	100	5334505	ND	100	5334505	ND	100	5334505
Total Potassium (K)	ug/L	300	100	5334505	290	100	5334505	500	100	5334505
Total Selenium (Se)	ug/L	ND	1.0	5334505	ND	1.0	5334505	ND	1.0	5334505
Total Silver (Ag)	ug/L	ND	0.10	5334505	ND	0.10	5334505	ND	0.10	5334505
Total Sodium (Na)	ug/L	2700	100	5334505	2800	100	5334505	2800	100	5334505
Total Strontium (Sr)	ug/L	6.5	2.0	5334505	6.4	2.0	5334505	5.7	2.0	5334505
Total Thallium (Tl)	ug/L	ND	0.10	5334505	ND	0.10	5334505	ND	0.10	5334505
Total Tin (Sn)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505
Total Titanium (Ti)	ug/L	2.2	2.0	5334505	ND	2.0	5334505	4.7	2.0	5334505
Total Uranium (U)	ug/L	ND	0.10	5334505	ND	0.10	5334505	ND	0.10	5334505
Total Vanadium (V)	ug/L	ND	2.0	5334505	ND	2.0	5334505	ND	2.0	5334505
Total Zinc (Zn)	ug/L	ND	5.0	5334505	ND	5.0	5334505	6.8	5.0	5334505

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG667		FVG668		FVG669		
Sampling Date		2017/12/21 10:10		2017/12/20 10:00		2017/12/20 09:15		
COC Number		643303-02-01		643303-02-01		643303-02-01		
	UNITS	SW11	QC Batch	SW12	QC Batch	SW13	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	0.140	5333082	0.100	5333082	0.100	N/A	5333082
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	5333079	ND	5333079	ND	1.0	5333079
Calculated TDS	mg/L	13	5333087	11	5333087	12	1.0	5333087
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	5333079	ND	5333079	ND	1.0	5333079
Cation Sum	me/L	0.260	5333082	0.200	5333082	0.210	N/A	5333082
Hardness (CaCO3)	mg/L	3.8	5333080	3.5	5333080	3.3	1.0	5333080
Ion Balance (% Difference)	%	30.0	5333081	33.3	5333081	35.5	N/A	5333081
Langelier Index (@ 20C)	N/A	NC	5333085	NC	5333085	NC		5333085
Langelier Index (@ 4C)	N/A	NC	5333086	NC	5333086	NC		5333086
Nitrate (N)	mg/L	ND	5333083	ND	5333083	ND	0.050	5333083
Saturation pH (@ 20C)	N/A	NC	5333085	NC	5333085	NC		5333085
Saturation pH (@ 4C)	N/A	NC	5333086	NC	5333086	NC		5333086
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	ND	5334802	ND	5334802	ND	5.0	5334802
Dissolved Chloride (Cl)	mg/L	4.9	5334807	3.4	5334807	3.7	1.0	5334807
Colour	TCU	130 (1)	5334835	120 (1)	5334835	110 (1)	25	5334835
Nitrate + Nitrite (N)	mg/L	ND	5334865	ND	5334865	ND	0.050	5334865
Nitrite (N)	mg/L	ND	5334867	ND	5334867	ND	0.010	5334867
Nitrogen (Ammonia Nitrogen)	mg/L	ND	5334981	ND	5334981	ND	0.050	5334981
Total Organic Carbon (C)	mg/L	14 (1)	5339637	11 (1)	5339637	13 (1)	5.0	5339637
Orthophosphate (P)	mg/L	ND	5334837	ND	5334837	ND	0.010	5334837
pH	pH	4.83	5336497	4.97	5336497	4.99	N/A	5336497
Reactive Silica (SiO2)	mg/L	3.0	5334830	3.0	5334830	3.9	0.50	5334830
Dissolved Sulphate (SO4)	mg/L	ND	5334811	ND	5334811	ND	2.0	5334811
Turbidity	NTU	0.77	5336624	1.4	5336624	0.39	0.10	5336624
Conductivity	uS/cm	30	5336498	26	5336498	28	1.0	5336498
Metals								
Total Aluminum (Al)	ug/L	290	5334503	240	5334505	180	5.0	5334503
Total Antimony (Sb)	ug/L	ND	5334503	ND	5334505	ND	1.0	5334503
Total Arsenic (As)	ug/L	ND	5334503	ND	5334505	ND	1.0	5334503
Total Barium (Ba)	ug/L	4.8	5334503	3.9	5334505	3.2	1.0	5334503
Total Beryllium (Be)	ug/L	ND	5334503	ND	5334505	ND	1.0	5334503
Total Bismuth (Bi)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
N/A = Not Applicable								
ND = Not detected								
(1) Elevated reporting limit due to sample matrix.								

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FVG667		FVG668		FVG669		
Sampling Date		2017/12/21 10:10		2017/12/20 10:00		2017/12/20 09:15		
COC Number		643303-02-01		643303-02-01		643303-02-01		
	UNITS	SW11	QC Batch	SW12	QC Batch	SW13	RDL	QC Batch
Total Boron (B)	ug/L	ND	5334503	ND	5334505	ND	50	5334503
Total Cadmium (Cd)	ug/L	0.019	5334503	0.020	5334505	0.010	0.010	5334503
Total Calcium (Ca)	ug/L	810	5334503	690	5334505	560	100	5334503
Total Chromium (Cr)	ug/L	ND	5334503	ND	5334505	ND	1.0	5334503
Total Cobalt (Co)	ug/L	ND	5334503	0.44	5334505	ND	0.40	5334503
Total Copper (Cu)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
Total Iron (Fe)	ug/L	330	5334503	550	5334505	800	50	5334503
Total Lead (Pb)	ug/L	0.66	5334503	ND	5334505	ND	0.50	5334503
Total Magnesium (Mg)	ug/L	420	5334503	440	5334505	450	100	5334503
Total Manganese (Mn)	ug/L	40	5334503	79	5334505	61	2.0	5334503
Total Molybdenum (Mo)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
Total Nickel (Ni)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
Total Phosphorus (P)	ug/L	ND	5334503	ND	5334505	ND	100	5334503
Total Potassium (K)	ug/L	990	5334503	280	5334505	270	100	5334503
Total Selenium (Se)	ug/L	ND	5334503	ND	5334505	ND	1.0	5334503
Total Silver (Ag)	ug/L	ND	5334503	ND	5334505	ND	0.10	5334503
Total Sodium (Na)	ug/L	3000	5334503	2100	5334505	2200	100	5334503
Total Strontium (Sr)	ug/L	7.5	5334503	6.5	5334505	6.0	2.0	5334503
Total Thallium (Tl)	ug/L	ND	5334503	ND	5334505	ND	0.10	5334503
Total Tin (Sn)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
Total Titanium (Ti)	ug/L	3.4	5334503	3.3	5334505	3.1	2.0	5334503
Total Uranium (U)	ug/L	ND	5334503	ND	5334505	ND	0.10	5334503
Total Vanadium (V)	ug/L	ND	5334503	ND	5334505	ND	2.0	5334503
Total Zinc (Zn)	ug/L	5.5	5334503	ND	5334505	ND	5.0	5334503
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected								

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		FVG654	FVG655	FVG656	FVG657	FVG658	FVG659		
Sampling Date		2017/12/20 13:34	2017/12/20 12:25	2017/12/21 11:05	2017/12/20 12:05	2017/12/20 14:35	2017/12/21 15:11		
COC Number		643303-01-01	643303-01-01	643303-01-01	643303-01-01	643303-01-01	643303-01-01		
	UNITS	SW1	SW2	SW3	SW4	SW5	SW6	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	0.013	5336786
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

Maxxam ID		FVG660	FVG661	FVG662	FVG663	FVG667	FVG668		
Sampling Date		2017/12/21 14:46	2017/12/21 14:10	2017/12/21 13:20	2017/12/21 12:00	2017/12/21 10:10	2017/12/20 10:00		
COC Number		643303-01-01	643303-01-01	643303-01-01	643303-01-01	643303-02-01	643303-02-01		
	UNITS	SW7	SW8	SW9	SW10	SW11	SW12	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	0.013	5336786
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected									

Maxxam ID		FVG669		
Sampling Date		2017/12/20 09:15		
COC Number		643303-02-01		
	UNITS	SW13	RDL	QC Batch
Metals				
Total Mercury (Hg)	ug/L	ND	0.013	5336793
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not detected				

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.3°C
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Sample FVG654 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG655 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG656 [SW3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG657 [SW4] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG658 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG659 [SW6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG660 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG661 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG662 [SW9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG663 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG667 [SW11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG668 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample FVG669 [SW13] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5334503	BAN	Matrix Spike	Total Aluminum (Al)	2017/12/29	99	%	80 - 120		
			Total Antimony (Sb)	2017/12/29	102	%	80 - 120		
			Total Arsenic (As)	2017/12/29	99	%	80 - 120		
			Total Barium (Ba)	2017/12/29	98	%	80 - 120		
			Total Beryllium (Be)	2017/12/29	101	%	80 - 120		
			Total Bismuth (Bi)	2017/12/29	101	%	80 - 120		
			Total Boron (B)	2017/12/29	104	%	80 - 120		
			Total Cadmium (Cd)	2017/12/29	99	%	80 - 120		
			Total Calcium (Ca)	2017/12/29	102	%	80 - 120		
			Total Chromium (Cr)	2017/12/29	98	%	80 - 120		
			Total Cobalt (Co)	2017/12/29	99	%	80 - 120		
			Total Copper (Cu)	2017/12/29	95	%	80 - 120		
			Total Iron (Fe)	2017/12/29	103	%	80 - 120		
			Total Lead (Pb)	2017/12/29	98	%	80 - 120		
			Total Magnesium (Mg)	2017/12/29	101	%	80 - 120		
			Total Manganese (Mn)	2017/12/29	97	%	80 - 120		
			Total Molybdenum (Mo)	2017/12/29	105	%	80 - 120		
			Total Nickel (Ni)	2017/12/29	98	%	80 - 120		
			Total Phosphorus (P)	2017/12/29	101	%	80 - 120		
			Total Potassium (K)	2017/12/29	104	%	80 - 120		
			Total Selenium (Se)	2017/12/29	101	%	80 - 120		
			Total Silver (Ag)	2017/12/29	99	%	80 - 120		
			Total Sodium (Na)	2017/12/29	NC	%	80 - 120		
			Total Strontium (Sr)	2017/12/29	99	%	80 - 120		
			Total Thallium (Tl)	2017/12/29	100	%	80 - 120		
			Total Tin (Sn)	2017/12/29	102	%	80 - 120		
			Total Titanium (Ti)	2017/12/29	99	%	80 - 120		
			Total Uranium (U)	2017/12/29	104	%	80 - 120		
			Total Vanadium (V)	2017/12/29	100	%	80 - 120		
			Total Zinc (Zn)	2017/12/29	99	%	80 - 120		
			5334503	BAN	Spiked Blank	Total Aluminum (Al)	2017/12/29	98	%
Total Antimony (Sb)	2017/12/29	101				%	80 - 120		
Total Arsenic (As)	2017/12/29	97				%	80 - 120		
Total Barium (Ba)	2017/12/29	95				%	80 - 120		
Total Beryllium (Be)	2017/12/29	100				%	80 - 120		
Total Bismuth (Bi)	2017/12/29	99				%	80 - 120		
Total Boron (B)	2017/12/29	102				%	80 - 120		
Total Cadmium (Cd)	2017/12/29	96				%	80 - 120		
Total Calcium (Ca)	2017/12/29	101				%	80 - 120		
Total Chromium (Cr)	2017/12/29	98				%	80 - 120		
Total Cobalt (Co)	2017/12/29	98				%	80 - 120		
Total Copper (Cu)	2017/12/29	97				%	80 - 120		
Total Iron (Fe)	2017/12/29	102				%	80 - 120		
Total Lead (Pb)	2017/12/29	97				%	80 - 120		
Total Magnesium (Mg)	2017/12/29	100				%	80 - 120		
Total Manganese (Mn)	2017/12/29	98				%	80 - 120		
Total Molybdenum (Mo)	2017/12/29	100				%	80 - 120		
Total Nickel (Ni)	2017/12/29	99				%	80 - 120		
Total Phosphorus (P)	2017/12/29	100				%	80 - 120		
Total Potassium (K)	2017/12/29	102				%	80 - 120		
Total Selenium (Se)	2017/12/29	99				%	80 - 120		
Total Silver (Ag)	2017/12/29	98				%	80 - 120		
Total Sodium (Na)	2017/12/29	98				%	80 - 120		
Total Strontium (Sr)	2017/12/29	97				%	80 - 120		
Total Thallium (Tl)	2017/12/29	99	%	80 - 120					

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Tin (Sn)	2017/12/29		103	%	80 - 120
			Total Titanium (Ti)	2017/12/29		101	%	80 - 120
			Total Uranium (U)	2017/12/29		102	%	80 - 120
			Total Vanadium (V)	2017/12/29		99	%	80 - 120
			Total Zinc (Zn)	2017/12/29		98	%	80 - 120
5334503	BAN	Method Blank	Total Aluminum (Al)	2017/12/29	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Bismuth (Bi)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Boron (B)	2017/12/29	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2017/12/29	ND, RDL=0.010		ug/L	
			Total Calcium (Ca)	2017/12/29	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2017/12/29	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2017/12/29	ND, RDL=50		ug/L	
			Total Lead (Pb)	2017/12/29	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2017/12/29	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2017/12/29	ND, RDL=100		ug/L	
			Total Potassium (K)	2017/12/29	ND, RDL=100		ug/L	
			Total Selenium (Se)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2017/12/29	ND, RDL=0.10		ug/L	
			Total Sodium (Na)	2017/12/29	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2017/12/29	ND, RDL=0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Tin (Sn)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2017/12/29	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2017/12/29	ND, RDL=5.0		ug/L	
5334503	BAN	RPD	Total Aluminum (Al)	2017/12/29	NC		%	20
			Total Antimony (Sb)	2017/12/29	NC		%	20
			Total Arsenic (As)	2017/12/29	2.4		%	20
			Total Barium (Ba)	2017/12/29	2.5		%	20
			Total Beryllium (Be)	2017/12/29	NC		%	20
			Total Bismuth (Bi)	2017/12/29	NC		%	20
			Total Boron (B)	2017/12/29	NC		%	20
			Total Cadmium (Cd)	2017/12/29	NC		%	20
			Total Calcium (Ca)	2017/12/29	0.48		%	20
			Total Chromium (Cr)	2017/12/29	NC		%	20
			Total Cobalt (Co)	2017/12/29	NC		%	20
			Total Copper (Cu)	2017/12/29	NC		%	20
			Total Iron (Fe)	2017/12/29	2.4		%	20
			Total Lead (Pb)	2017/12/29	NC		%	20
			Total Magnesium (Mg)	2017/12/29	3.1		%	20
			Total Manganese (Mn)	2017/12/29	2.0		%	20
			Total Molybdenum (Mo)	2017/12/29	NC		%	20
			Total Nickel (Ni)	2017/12/29	NC		%	20
			Total Phosphorus (P)	2017/12/29	NC		%	20
			Total Potassium (K)	2017/12/29	1.7		%	20
			Total Selenium (Se)	2017/12/29	NC		%	20
			Total Silver (Ag)	2017/12/29	NC		%	20
			Total Sodium (Na)	2017/12/29	2.5		%	20
			Total Strontium (Sr)	2017/12/29	3.5		%	20
			Total Thallium (Tl)	2017/12/29	NC		%	20
			Total Tin (Sn)	2017/12/29	NC		%	20
			Total Titanium (Ti)	2017/12/29	NC		%	20
			Total Uranium (U)	2017/12/29	0.50		%	20
			Total Vanadium (V)	2017/12/29	NC		%	20
			Total Zinc (Zn)	2017/12/29	NC		%	20
5334505	BAN	Matrix Spike	Total Aluminum (Al)	2017/12/29		96	%	80 - 120
			Total Antimony (Sb)	2017/12/29		105	%	80 - 120
			Total Arsenic (As)	2017/12/29		98	%	80 - 120
			Total Barium (Ba)	2017/12/29		95	%	80 - 120
			Total Beryllium (Be)	2017/12/29		99	%	80 - 120
			Total Bismuth (Bi)	2017/12/29		100	%	80 - 120
			Total Boron (B)	2017/12/29		101	%	80 - 120
			Total Cadmium (Cd)	2017/12/29		99	%	80 - 120
			Total Calcium (Ca)	2017/12/29		101	%	80 - 120
			Total Chromium (Cr)	2017/12/29		98	%	80 - 120
			Total Cobalt (Co)	2017/12/29		99	%	80 - 120
			Total Copper (Cu)	2017/12/29		96	%	80 - 120
			Total Iron (Fe)	2017/12/29		102	%	80 - 120
			Total Lead (Pb)	2017/12/29		96	%	80 - 120
			Total Magnesium (Mg)	2017/12/29		101	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Manganese (Mn)	2017/12/29		99	%	80 - 120
			Total Molybdenum (Mo)	2017/12/29		104	%	80 - 120
			Total Nickel (Ni)	2017/12/29		97	%	80 - 120
			Total Phosphorus (P)	2017/12/29		100	%	80 - 120
			Total Potassium (K)	2017/12/29		102	%	80 - 120
			Total Selenium (Se)	2017/12/29		99	%	80 - 120
			Total Silver (Ag)	2017/12/29		96	%	80 - 120
			Total Sodium (Na)	2017/12/29		NC	%	80 - 120
			Total Strontium (Sr)	2017/12/29		102	%	80 - 120
			Total Thallium (Tl)	2017/12/29		98	%	80 - 120
			Total Tin (Sn)	2017/12/29		104	%	80 - 120
			Total Titanium (Ti)	2017/12/29		99	%	80 - 120
			Total Uranium (U)	2017/12/29		102	%	80 - 120
			Total Vanadium (V)	2017/12/29		100	%	80 - 120
			Total Zinc (Zn)	2017/12/29		100	%	80 - 120
5334505	BAN	Spiked Blank	Total Aluminum (Al)	2017/12/29		97	%	80 - 120
			Total Antimony (Sb)	2017/12/29		100	%	80 - 120
			Total Arsenic (As)	2017/12/29		97	%	80 - 120
			Total Barium (Ba)	2017/12/29		98	%	80 - 120
			Total Beryllium (Be)	2017/12/29		101	%	80 - 120
			Total Bismuth (Bi)	2017/12/29		101	%	80 - 120
			Total Boron (B)	2017/12/29		101	%	80 - 120
			Total Cadmium (Cd)	2017/12/29		98	%	80 - 120
			Total Calcium (Ca)	2017/12/29		102	%	80 - 120
			Total Chromium (Cr)	2017/12/29		99	%	80 - 120
			Total Cobalt (Co)	2017/12/29		100	%	80 - 120
			Total Copper (Cu)	2017/12/29		99	%	80 - 120
			Total Iron (Fe)	2017/12/29		102	%	80 - 120
			Total Lead (Pb)	2017/12/29		97	%	80 - 120
			Total Magnesium (Mg)	2017/12/29		102	%	80 - 120
			Total Manganese (Mn)	2017/12/29		99	%	80 - 120
			Total Molybdenum (Mo)	2017/12/29		100	%	80 - 120
			Total Nickel (Ni)	2017/12/29		98	%	80 - 120
			Total Phosphorus (P)	2017/12/29		101	%	80 - 120
			Total Potassium (K)	2017/12/29		102	%	80 - 120
			Total Selenium (Se)	2017/12/29		98	%	80 - 120
			Total Silver (Ag)	2017/12/29		97	%	80 - 120
			Total Sodium (Na)	2017/12/29		98	%	80 - 120
			Total Strontium (Sr)	2017/12/29		102	%	80 - 120
			Total Thallium (Tl)	2017/12/29		100	%	80 - 120
			Total Tin (Sn)	2017/12/29		101	%	80 - 120
			Total Titanium (Ti)	2017/12/29		97	%	80 - 120
			Total Uranium (U)	2017/12/29		101	%	80 - 120
			Total Vanadium (V)	2017/12/29		100	%	80 - 120
			Total Zinc (Zn)	2017/12/29		98	%	80 - 120
5334505	BAN	Method Blank	Total Aluminum (Al)	2017/12/29	ND, RDL=5.0		ug/L	
			Total Antimony (Sb)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Arsenic (As)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Barium (Ba)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Beryllium (Be)	2017/12/29	ND, RDL=1.0		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Boron (B)	2017/12/29	ND, RDL=50		ug/L	
			Total Cadmium (Cd)	2017/12/29	ND, RDL=0.010		ug/L	
			Total Calcium (Ca)	2017/12/29	ND, RDL=100		ug/L	
			Total Chromium (Cr)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Cobalt (Co)	2017/12/29	ND, RDL=0.40		ug/L	
			Total Copper (Cu)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Iron (Fe)	2017/12/29	ND, RDL=50		ug/L	
			Total Lead (Pb)	2017/12/29	ND, RDL=0.50		ug/L	
			Total Magnesium (Mg)	2017/12/29	ND, RDL=100		ug/L	
			Total Manganese (Mn)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Nickel (Ni)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Phosphorus (P)	2017/12/29	ND, RDL=100		ug/L	
			Total Potassium (K)	2017/12/29	ND, RDL=100		ug/L	
			Total Selenium (Se)	2017/12/29	ND, RDL=1.0		ug/L	
			Total Silver (Ag)	2017/12/29	ND, RDL=0.10		ug/L	
			Total Sodium (Na)	2017/12/29	ND, RDL=100		ug/L	
			Total Strontium (Sr)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Thallium (Tl)	2017/12/29	ND, RDL=0.10		ug/L	
			Total Tin (Sn)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Titanium (Ti)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Uranium (U)	2017/12/29	ND, RDL=0.10		ug/L	
			Total Vanadium (V)	2017/12/29	ND, RDL=2.0		ug/L	
			Total Zinc (Zn)	2017/12/29	ND, RDL=5.0		ug/L	
5334505	BAN	RPD	Total Aluminum (Al)	2017/12/29	2.6		%	20
			Total Antimony (Sb)	2017/12/29	NC		%	20
			Total Arsenic (As)	2017/12/29	NC		%	20
			Total Barium (Ba)	2017/12/29	NC		%	20
			Total Beryllium (Be)	2017/12/29	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Boron (B)	2017/12/29	NC		%	20
			Total Cadmium (Cd)	2017/12/29	NC		%	20
			Total Calcium (Ca)	2017/12/29	0.069		%	20
			Total Chromium (Cr)	2017/12/29	NC		%	20
			Total Cobalt (Co)	2017/12/29	NC		%	20
			Total Copper (Cu)	2017/12/29	2.4		%	20
			Total Iron (Fe)	2017/12/29	0.79		%	20
			Total Lead (Pb)	2017/12/29	0.015		%	20
			Total Magnesium (Mg)	2017/12/29	2.4		%	20
			Total Manganese (Mn)	2017/12/29	NC		%	20
			Total Molybdenum (Mo)	2017/12/29	NC		%	20
			Total Nickel (Ni)	2017/12/29	NC		%	20
			Total Potassium (K)	2017/12/29	0.23		%	20
			Total Selenium (Se)	2017/12/29	NC		%	20
			Total Silver (Ag)	2017/12/29	NC		%	20
			Total Sodium (Na)	2017/12/29	1.3		%	20
			Total Strontium (Sr)	2017/12/29	3.0		%	20
			Total Thallium (Tl)	2017/12/29	NC		%	20
			Total Tin (Sn)	2017/12/29	NC		%	20
			Total Titanium (Ti)	2017/12/29	NC		%	20
			Total Uranium (U)	2017/12/29	NC		%	20
			Total Vanadium (V)	2017/12/29	NC		%	20
			Total Zinc (Zn)	2017/12/29	2.2		%	20
5334802	JHY	Matrix Spike [FVG662-01]	Total Alkalinity (Total as CaCO3)	2018/01/02		102	%	80 - 120
5334802	JHY	Spiked Blank	Total Alkalinity (Total as CaCO3)	2018/01/02		108	%	80 - 120
5334802	JHY	Method Blank	Total Alkalinity (Total as CaCO3)	2018/01/02	ND, RDL=5.0		mg/L	
5334802	JHY	RPD [FVG662-01]	Total Alkalinity (Total as CaCO3)	2018/01/02	NC		%	25
5334807	JHY	Matrix Spike [FVG662-01]	Dissolved Chloride (Cl)	2018/01/03		106	%	80 - 120
5334807	JHY	QC Standard	Dissolved Chloride (Cl)	2018/01/03		111	%	80 - 120
5334807	JHY	Spiked Blank	Dissolved Chloride (Cl)	2018/01/03		97	%	80 - 120
5334807	JHY	Method Blank	Dissolved Chloride (Cl)	2018/01/03	ND, RDL=1.0		mg/L	
5334807	JHY	RPD [FVG662-01]	Dissolved Chloride (Cl)	2018/01/03	0.24		%	25
5334811	JHY	Matrix Spike [FVG662-01]	Dissolved Sulphate (SO4)	2018/01/03		102	%	80 - 120
5334811	JHY	Spiked Blank	Dissolved Sulphate (SO4)	2018/01/03		96	%	80 - 120
5334811	JHY	Method Blank	Dissolved Sulphate (SO4)	2018/01/03	ND, RDL=2.0		mg/L	
5334811	JHY	RPD [FVG662-01]	Dissolved Sulphate (SO4)	2018/01/03	NC		%	25
5334830	JHY	Matrix Spike [FVG662-01]	Reactive Silica (SiO2)	2018/01/03		97	%	80 - 120
5334830	JHY	Spiked Blank	Reactive Silica (SiO2)	2018/01/03		98	%	80 - 120
5334830	JHY	Method Blank	Reactive Silica (SiO2)	2018/01/03	ND, RDL=0.50		mg/L	
5334830	JHY	RPD [FVG662-01]	Reactive Silica (SiO2)	2018/01/03	1.4		%	25
5334835	JHY	Spiked Blank	Colour	2018/01/03		100	%	80 - 120
5334835	JHY	Method Blank	Colour	2018/01/03	ND, RDL=5.0		TCU	
5334835	JHY	RPD [FVG662-01]	Colour	2018/01/03	3.8 (1)		%	20
5334837	JHY	Matrix Spike [FVG662-01]	Orthophosphate (P)	2018/01/03		92	%	80 - 120
5334837	JHY	Spiked Blank	Orthophosphate (P)	2018/01/03		92	%	80 - 120
5334837	JHY	Method Blank	Orthophosphate (P)	2018/01/03	ND, RDL=0.010		mg/L	
5334837	JHY	RPD [FVG662-01]	Orthophosphate (P)	2018/01/03	NC		%	25
5334865	JHY	Matrix Spike [FVG662-01]	Nitrate + Nitrite (N)	2018/01/03		101	%	80 - 120
5334865	JHY	Spiked Blank	Nitrate + Nitrite (N)	2018/01/03		94	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

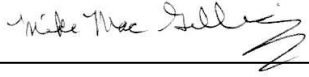
QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5334865	JHY	Method Blank	Nitrate + Nitrite (N)	2018/01/03	ND, RDL=0.050		mg/L	
5334865	JHY	RPD [FVG662-01]	Nitrate + Nitrite (N)	2018/01/03	NC		%	25
5334867	JHY	Matrix Spike [FVG662-01]	Nitrite (N)	2018/01/03		93	%	80 - 120
5334867	JHY	Spiked Blank	Nitrite (N)	2018/01/03		98	%	80 - 120
5334867	JHY	Method Blank	Nitrite (N)	2018/01/03	ND, RDL=0.010		mg/L	
5334867	JHY	RPD [FVG662-01]	Nitrite (N)	2018/01/03	NC		%	25
5334977	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2018/01/02		90	%	80 - 120
5334977	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2018/01/02		106	%	80 - 120
5334977	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2018/01/02	ND, RDL=0.050		mg/L	
5334977	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2018/01/02	2.4		%	20
5334981	MCN	Matrix Spike [FVG661-03]	Nitrogen (Ammonia Nitrogen)	2018/01/02		102	%	80 - 120
5334981	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2018/01/02		103	%	80 - 120
5334981	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2018/01/02	ND, RDL=0.050		mg/L	
5334981	MCN	RPD [FVG661-03]	Nitrogen (Ammonia Nitrogen)	2018/01/02	NC		%	20
5336497	JMV	QC Standard	pH	2018/01/02		100	%	97 - 103
5336497	JMV	RPD	pH	2018/01/02	0.67		%	N/A
5336498	JMV	Spiked Blank	Conductivity	2018/01/02		102	%	80 - 120
5336498	JMV	Method Blank	Conductivity	2018/01/02	1.8, RDL=1.0		uS/cm	
5336498	JMV	RPD	Conductivity	2018/01/02	0.36		%	25
5336500	JMV	QC Standard	pH	2018/01/02		100	%	97 - 103
5336500	JMV	RPD	pH	2018/01/02	0.48		%	N/A
5336501	JMV	Spiked Blank	Conductivity	2018/01/02		102	%	80 - 120
5336501	JMV	Method Blank	Conductivity	2018/01/02	1.8, RDL=1.0		uS/cm	
5336501	JMV	RPD	Conductivity	2018/01/02	0.88		%	25
5336619	JMV	QC Standard	Turbidity	2018/01/02		95	%	80 - 120
5336619	JMV	Spiked Blank	Turbidity	2018/01/02		93	%	80 - 120
5336619	JMV	Method Blank	Turbidity	2018/01/02	ND, RDL=0.10		NTU	
5336619	JMV	RPD [FVG662-01]	Turbidity	2018/01/02	4.5		%	20
5336624	JMV	QC Standard	Turbidity	2018/01/02		95	%	80 - 120
5336624	JMV	Spiked Blank	Turbidity	2018/01/02		92	%	80 - 120
5336624	JMV	Method Blank	Turbidity	2018/01/02	ND, RDL=0.10		NTU	
5336624	JMV	RPD	Turbidity	2018/01/02	4.9		%	20
5336786	ARS	Matrix Spike	Total Mercury (Hg)	2018/01/03		108	%	80 - 120
5336786	ARS	Spiked Blank	Total Mercury (Hg)	2018/01/03		104	%	80 - 120
5336786	ARS	Method Blank	Total Mercury (Hg)	2018/01/03	ND, RDL=0.013		ug/L	
5336786	ARS	RPD	Total Mercury (Hg)	2018/01/03	NC		%	20
5336793	ARS	Matrix Spike	Total Mercury (Hg)	2018/01/03		103	%	80 - 120
5336793	ARS	Spiked Blank	Total Mercury (Hg)	2018/01/03		104	%	80 - 120
5336793	ARS	Method Blank	Total Mercury (Hg)	2018/01/03	ND, RDL=0.013		ug/L	
5336793	ARS	RPD	Total Mercury (Hg)	2018/01/03	NC		%	20
5339637	LMP	Matrix Spike [FVG660-03]	Total Organic Carbon (C)	2018/01/04		107	%	80 - 120
5339637	LMP	Spiked Blank	Total Organic Carbon (C)	2018/01/04		108	%	80 - 120
5339637	LMP	Method Blank	Total Organic Carbon (C)	2018/01/04	ND, RDL=0.50		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	5339637	LMP	RPD [FVG660-03]	Total Organic Carbon (C)	2018/01/04	1.9		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>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)</p> <p>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).</p> <p>(1) Elevated reporting limit due to sample matrix.</p>									

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: 2789
Your Project #: FMS
Your C.O.C. #: 666909-01-01, 666909-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/06/26

Report #: R5266830

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8F1960

Received: 2018/06/19, 13:27

Sample Matrix: Water
Samples Received: 11

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Carbonate, Bicarbonate and Hydroxide	11	N/A	2018/06/25	N/A	SM 22 4500-CO2 D
Alkalinity	11	N/A	2018/06/25	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	11	N/A	2018/06/22	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	11	N/A	2018/06/22	ATL SOP 00020	SM 22 2120C m
Conductance - water	11	N/A	2018/06/25	ATL SOP 00004	SM 23 2510B m
Hardness (calculated as CaCO3)	11	N/A	2018/06/25	ATL SOP 00048	SM 22 2340 B
Mercury - Dissolved (CVAA,LL)	11	2018/06/22	2018/06/25	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	11	2018/06/22	2018/06/25	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2018/06/22	2018/06/22	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	10	2018/06/22	2018/06/23	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	11	N/A	2018/06/26	N/A	Auto Calc.
Anion and Cation Sum	11	N/A	2018/06/26	N/A	Auto Calc.
Nitrogen Ammonia - water	11	N/A	2018/06/25	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	11	N/A	2018/06/25	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	11	N/A	2018/06/25	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	11	N/A	2018/06/26	ATL SOP 00018	ASTM D3867-16
pH (1)	11	N/A	2018/06/25	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	11	N/A	2018/06/22	ATL SOP 00021	SM 23 4500-P E m
Sat. pH and Langelier Index (@ 20C)	11	N/A	2018/06/26	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	11	N/A	2018/06/26	ATL SOP 00049	Auto Calc.
Reactive Silica	11	N/A	2018/06/25	ATL SOP 00022	EPA 366.0 m
Sulphate	11	N/A	2018/06/22	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	11	N/A	2018/06/26	N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	1	N/A	2018/06/24	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (2)	10	N/A	2018/06/25	ATL SOP 00203	SM 23 5310B m
Turbidity	10	N/A	2018/06/25	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	1	N/A	2018/06/26	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

Your P.O. #: 2789
Your Project #: FMS
Your C.O.C. #: 666909-01-01, 666909-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/06/26
Report #: R5266830
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8F1960

Received: 2018/06/19, 13:27

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) 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.

(2) 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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====
This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HAB709		HAB709		HAB710		HAB711		HAB712	
Sampling Date		2018/06/18 11:45		2018/06/18 11:45		2018/06/18 11:05		2018/06/18 12:35		2018/06/18 13:25	
COC Number		666909-01-01		666909-01-01		666909-01-01		666909-01-01		666909-01-01	
	UNITS	SW1	RDL	SW1 Lab-Dup	RDL	SW2	SW3	SW4	RDL		
Calculated Parameters											
Anion Sum	me/L	0.210	N/A			0.100	0.110	0.340	N/A		
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	5.3	1.0			ND	ND	12	1.0		
Calculated TDS	mg/L	14	1.0			8.0	9.0	23	1.0		
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	1.0			ND	ND	ND	1.0		
Cation Sum	me/L	0.180	N/A			0.160	0.160	0.400	N/A		
Hardness (CaCO ₃)	mg/L	2.9	1.0			2.7	2.9	10	1.0		
Ion Balance (% Difference)	%	7.69	N/A			23.1	18.5	8.11	N/A		
Langelier Index (@ 20C)	N/A	-4.70				NC	NC	-3.11			
Langelier Index (@ 4C)	N/A	-4.95				NC	NC	-3.36			
Nitrate (N)	mg/L	ND	0.050			ND	ND	ND	0.050		
Saturation pH (@ 20C)	N/A	10.7				NC	NC	9.69			
Saturation pH (@ 4C)	N/A	11.0				NC	NC	9.94			
Inorganics											
Total Alkalinity (Total as CaCO ₃)	mg/L	5.3	5.0			ND	ND	12	5.0		
Dissolved Chloride (Cl)	mg/L	3.6	1.0			3.7	3.7	3.7	1.0		
Colour	TCU	75 (1)	25			25	9.8	33	5.0		
Nitrate + Nitrite (N)	mg/L	ND	0.050			ND	ND	ND	0.050		
Nitrite (N)	mg/L	ND	0.010			ND	ND	ND	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050			ND	ND	0.052	0.050		
Total Organic Carbon (C)	mg/L	8.3	0.50	8.9	0.50	4.9	3.2	6.3	0.50		
Orthophosphate (P)	mg/L	ND	0.010			ND	ND	0.022	0.010		
pH	pH	6.03	N/A			6.17	6.13	6.58	N/A		
Reactive Silica (SiO ₂)	mg/L	3.1	0.50			0.56	1.7	2.9	0.50		
Dissolved Sulphate (SO ₄)	mg/L	ND	2.0			ND	ND	ND	2.0		
Turbidity	NTU	0.46	0.10			2.3	1.4	1.9	0.10		
Conductivity	uS/cm	26	1.0			22	22	39	1.0		
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable ND = Not detected (1) Elevated reporting limit due to sample matrix.											

RESULTS OF ANALYSES OF WATER

Maxxam ID		HAB713		HAB714		HAB714		HAB715	HAB716	
Sampling Date		2018/06/18 13:40		2018/06/18 16:10		2018/06/18 16:10		2018/06/18 15:50	2018/06/18 15:07	
COC Number		666909-01-01		666909-01-01		666909-01-01		666909-01-01	666909-01-01	
	UNITS	SW5	RDL	SW6	RDL	SW6 Lab-Dup	RDL	SW7	SW8	RDL

Calculated Parameters										
Anion Sum	me/L	0.100	N/A	0.110	N/A			0.0700	0.130	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0			ND	ND	1.0
Calculated TDS	mg/L	7.0	1.0	9.0	1.0			8.0	9.0	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0			ND	ND	1.0
Cation Sum	me/L	0.180	N/A	0.200	N/A			0.190	0.200	N/A
Hardness (CaCO3)	mg/L	3.0	1.0	3.1	1.0			3.2	3.2	1.0
Ion Balance (% Difference)	%	28.6	N/A	29.0	N/A			46.2	21.2	N/A
Langelier Index (@ 20C)	N/A	NC		NC				NC	NC	
Langelier Index (@ 4C)	N/A	NC		NC				NC	NC	
Nitrate (N)	mg/L	ND	0.050	ND	0.050			ND	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC				NC	NC	
Saturation pH (@ 4C)	N/A	NC		NC				NC	NC	

Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0			ND	ND	5.0
Dissolved Chloride (Cl)	mg/L	3.4	1.0	4.0	1.0			2.6	4.6	1.0
Colour	TCU	36	5.0	63 (1)	25			25	42	5.0
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050			ND	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010			ND	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	ND	0.050
Total Organic Carbon (C)	mg/L	5.7	0.50	7.5	0.50			6.3	6.5	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010			ND	ND	0.010
pH	pH	6.14	N/A	6.23	N/A			6.10	6.27	N/A
Reactive Silica (SiO2)	mg/L	ND	0.50	1.1	0.50			1.3	ND	0.50
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0			ND	ND	2.0
Turbidity	NTU	1.3	0.10	1.6	0.10			2.2	0.68	0.10
Conductivity	uS/cm	22	1.0	28	1.0			22	26	1.0

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 ND = Not detected
 (1) Elevated reporting limit due to sample matrix.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HAB716		HAB717		HAB717		HAB718	HAB753	
Sampling Date		2018/06/18 15:07		2018/06/18 14:35		2018/06/18 14:35		2018/06/18 10:28	2018/06/18 13:05	
COC Number		666909-01-01		666909-01-01		666909-01-01		666909-01-01	666909-02-01	
	UNITS	SW8 Lab-Dup	RDL	SW9	RDL	SW9 Lab-Dup	RDL	SW10	SW11	RDL

Calculated Parameters

Anion Sum	me/L			0.220	N/A			0.210	0.180	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L			5.1	1.0			ND	ND	1.0
Calculated TDS	mg/L			13	1.0			16	12	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L			ND	1.0			ND	ND	1.0
Cation Sum	me/L			0.210	N/A			0.300	0.180	N/A
Hardness (CaCO3)	mg/L			3.1	1.0			3.9	2.7	1.0
Ion Balance (% Difference)	%			2.33	N/A			17.7	0.00	N/A
Langelier Index (@ 20C)	N/A			-4.52				NC	NC	
Langelier Index (@ 4C)	N/A			-4.77				NC	NC	
Nitrate (N)	mg/L			ND	0.050			ND	ND	0.050
Saturation pH (@ 20C)	N/A			10.7				NC	NC	
Saturation pH (@ 4C)	N/A			11.0				NC	NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	5.1	5.0			ND	ND	5.0
Dissolved Chloride (Cl)	mg/L	4.4	1.0	4.3	1.0			7.4	3.5	1.0
Colour	TCU	48	5.0	34	5.0			61 (1)	86 (1)	25
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050			ND	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010			ND	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L			ND	0.050			ND	ND	0.050
Total Organic Carbon (C)	mg/L			5.6	0.50			7.8	10	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010			ND	ND	0.010
pH	pH			6.22	N/A			5.80	5.56	N/A
Reactive Silica (SiO2)	mg/L	ND	0.50	0.95	0.50			1.5	1.2	0.50
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0			ND	3.9	2.0
Turbidity	NTU			1.1	0.10	1.2	0.10	0.82	1.1	0.10
Conductivity	uS/cm			27	1.0			38	44	1.0

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 ND = Not detected
 (1) Elevated reporting limit due to sample matrix.

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HAB709		HAB709		HAB710	HAB711	HAB712	HAB713	
Sampling Date		2018/06/18 11:45		2018/06/18 11:45		2018/06/18 11:05	2018/06/18 12:35	2018/06/18 13:25	2018/06/18 13:40	
COC Number		666909-01-01		666909-01-01		666909-01-01	666909-01-01	666909-01-01	666909-01-01	
	UNITS	SW1	RDL	SW1 Lab-Dup	RDL	SW2	SW3	SW4	SW5	RDL

Metals										
Dissolved Mercury (Hg)	ug/L	ND	0.013	ND	0.013	ND	ND	ND	ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	ND	0.013	ND	0.013

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

ND = Not detected

Maxxam ID		HAB714	HAB715	HAB716	HAB717	HAB718	HAB753	
Sampling Date		2018/06/18 16:10	2018/06/18 15:50	2018/06/18 15:07	2018/06/18 14:35	2018/06/18 10:28	2018/06/18 13:05	
COC Number		666909-01-01	666909-01-01	666909-01-01	666909-01-01	666909-01-01	666909-02-01	
	UNITS	SW6	SW7	SW8	SW9	SW10	SW11	RDL

Metals								
Dissolved Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	0.013
Total Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	0.013

RDL = Reportable Detection Limit

ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HAB709	HAB710	HAB711	HAB712	HAB713	HAB714	HAB715	
Sampling Date		2018/06/18 11:45	2018/06/18 11:05	2018/06/18 12:35	2018/06/18 13:25	2018/06/18 13:40	2018/06/18 16:10	2018/06/18 15:50	
COC Number		666909-01-01	666909-01-01	666909-01-01	666909-01-01	666909-01-01	666909-01-01	666909-01-01	
	UNITS	SW1	SW2	SW3	SW4	SW5	SW6	SW7	RDL

Metals									
Total Aluminum (Al)	ug/L	170	120	42	120	130	200	140	5.0
Total Antimony (Sb)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Arsenic (As)	ug/L	2.4	ND	ND	140	25	3.0	2.9	1.0
Total Barium (Ba)	ug/L	3.6	3.5	5.5	5.6	3.3	4.6	3.1	1.0
Total Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Bismuth (Bi)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Boron (B)	ug/L	ND	ND	ND	ND	ND	ND	ND	50
Total Cadmium (Cd)	ug/L	0.015	0.012	ND	0.011	ND	0.015	ND	0.010
Total Calcium (Ca)	ug/L	660	530	640	3400	670	680	750	100
Total Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Cobalt (Co)	ug/L	ND	ND	ND	1.1	ND	ND	0.63	0.40
Total Copper (Cu)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Iron (Fe)	ug/L	180	120	ND	1700	340	250	460	50
Total Lead (Pb)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.50
Total Magnesium (Mg)	ug/L	310	320	310	450	320	330	310	100
Total Manganese (Mn)	ug/L	35	47	12	350	77	61	280	2.0
Total Molybdenum (Mo)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Nickel (Ni)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	ND	100
Total Potassium (K)	ug/L	250	280	150	440	270	320	ND	100
Total Selenium (Se)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Silver (Ag)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Sodium (Na)	ug/L	2400	2300	2300	2700	2300	2700	2400	100
Total Strontium (Sr)	ug/L	6.7	5.9	8.5	12	6.1	5.6	4.6	2.0
Total Thallium (Tl)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Tin (Sn)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Titanium (Ti)	ug/L	2.1	ND	ND	ND	ND	2.6	2.3	2.0
Total Uranium (U)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Vanadium (V)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Zinc (Zn)	ug/L	ND	ND	ND	ND	ND	ND	ND	5.0

RDL = Reportable Detection Limit

ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HAB716	HAB717	HAB718	HAB753	
Sampling Date		2018/06/18 15:07	2018/06/18 14:35	2018/06/18 10:28	2018/06/18 13:05	
COC Number		666909-01-01	666909-01-01	666909-01-01	666909-02-01	
	UNITS	SW8	SW9	SW10	SW11	RDL
Metals						
Total Aluminum (Al)	ug/L	170	180	210	240	5.0
Total Antimony (Sb)	ug/L	ND	ND	ND	ND	1.0
Total Arsenic (As)	ug/L	ND	ND	1.4	ND	1.0
Total Barium (Ba)	ug/L	5.3	5.7	6.7	3.0	1.0
Total Beryllium (Be)	ug/L	ND	ND	ND	ND	1.0
Total Bismuth (Bi)	ug/L	ND	ND	ND	ND	2.0
Total Boron (B)	ug/L	ND	ND	ND	ND	50
Total Cadmium (Cd)	ug/L	0.012	0.012	0.017	ND	0.010
Total Calcium (Ca)	ug/L	690	670	890	600	100
Total Chromium (Cr)	ug/L	ND	ND	ND	ND	1.0
Total Cobalt (Co)	ug/L	ND	ND	ND	ND	0.40
Total Copper (Cu)	ug/L	ND	ND	ND	ND	2.0
Total Iron (Fe)	ug/L	170	150	220	230	50
Total Lead (Pb)	ug/L	ND	ND	ND	ND	0.50
Total Magnesium (Mg)	ug/L	360	350	400	290	100
Total Manganese (Mn)	ug/L	35	54	36	32	2.0
Total Molybdenum (Mo)	ug/L	ND	ND	ND	ND	2.0
Total Nickel (Ni)	ug/L	ND	ND	ND	ND	2.0
Total Phosphorus (P)	ug/L	ND	ND	ND	ND	100
Total Potassium (K)	ug/L	310	330	390	290	100
Total Selenium (Se)	ug/L	ND	ND	ND	ND	1.0
Total Silver (Ag)	ug/L	ND	ND	ND	ND	0.10
Total Sodium (Na)	ug/L	2900	3000	4700	2400	100
Total Strontium (Sr)	ug/L	5.6	5.6	7.7	6.1	2.0
Total Thallium (Tl)	ug/L	ND	ND	ND	ND	0.10
Total Tin (Sn)	ug/L	ND	ND	ND	ND	2.0
Total Titanium (Ti)	ug/L	2.4	ND	2.3	3.0	2.0
Total Uranium (U)	ug/L	ND	ND	ND	ND	0.10
Total Vanadium (V)	ug/L	ND	ND	ND	ND	2.0
Total Zinc (Zn)	ug/L	ND	ND	ND	ND	5.0
RDL = Reportable Detection Limit ND = Not detected						

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C
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Sample HAB709 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB710 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB711 [SW3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB712 [SW4] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB713 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB714 [SW6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB715 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

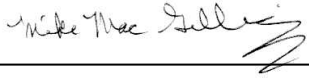
Sample HAB716 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HAB718 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B61799	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #		B8F1960	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	FMS		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #		Project Manager	
				Sampled By			Maryann Comeau
						C#669909-02-01	

Regulatory Criteria:		Special Instructions		ANALYSIS REQUESTED (PLEASE BE SPECIFIC)				Turnaround Time (TAT) Required:		
								Please provide advance notice for rush projects		
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal								Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input type="checkbox"/> Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.		
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM								Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ <input type="checkbox"/>		
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Mercury - Total (CVAA,LL)	Mercury - Dissolved (CVAA,LL)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW11	18/06/19	13:05	H ₂ O		X	X	X		
2										
3										
4										
5										
6										
7										
8										
9										
10										

2018 JUN 19 13:27

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only	
<i>Ryan Gardiner</i>		18/06/19	13:30	<i>D. Albert</i>					Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt: 5.9.6
								Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No		
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.										White: Maxxam Yellow: Client
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.										

Your Project #: FMS
Your C.O.C. #: D 29398

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/07/17

Report #: R5299511

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8H0622

Received: 2018/07/10, 10:47

Sample Matrix: Water
Samples Received: 1

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	1	N/A	2018/07/17 N/A	SM 22 4500-CO2 D
Alkalinity	1	N/A	2018/07/17 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	1	N/A	2018/07/16 ATL SOP 00014	SM 23 4500-Cl- E m
Colour	1	N/A	2018/07/16 ATL SOP 00020	SM 22 2120C m
Conductance - water	1	N/A	2018/07/16 ATL SOP 00004	SM 23 2510B m
Hardness (calculated as CaCO3)	1	N/A	2018/07/12 ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	1	2018/07/11	2018/07/12 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	1	2018/07/16	2018/07/17 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2018/07/11	2018/07/11 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	1	N/A	2018/07/17 N/A	Auto Calc.
Anion and Cation Sum	1	N/A	2018/07/17 N/A	Auto Calc.
Nitrogen Ammonia - water	1	N/A	2018/07/16 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	1	N/A	2018/07/17 ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	1	N/A	2018/07/14 ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	1	N/A	2018/07/17 ATL SOP 00018	ASTM D3867-16
pH (1)	1	N/A	2018/07/16 ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	1	N/A	2018/07/16 ATL SOP 00021	SM 23 4500-P E m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2018/07/17 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2018/07/17 ATL SOP 00049	Auto Calc.
Reactive Silica	1	N/A	2018/07/17 ATL SOP 00022	EPA 366.0 m
Sulphate	1	N/A	2018/07/16 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	1	N/A	2018/07/17 N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	1	N/A	2018/07/16 ATL SOP 00203	SM 23 5310B m
Turbidity	1	N/A	2018/07/13 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All

Your Project #: FMS
Your C.O.C. #: D 29398

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/07/17
Report #: R5299511
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8H0622

Received: 2018/07/10, 10:47

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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) 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.

(2) 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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====

This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HED800		HED800	
Sampling Date		2018/07/05 10:20		2018/07/05 10:20	
COC Number		D 29398		D 29398	
	UNITS	SW12	RDL	SW12 Lab-Dup	RDL

Calculated Parameters					
Anion Sum	me/L	0.120	N/A		
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	1.0		
Calculated TDS	mg/L	12	1.0		
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	1.0		
Cation Sum	me/L	0.240	N/A		
Hardness (CaCO ₃)	mg/L	4.2	1.0		
Ion Balance (% Difference)	%	33.3	N/A		
Langelier Index (@ 20C)	N/A	NC			
Langelier Index (@ 4C)	N/A	NC			
Nitrate (N)	mg/L	ND	0.050		
Saturation pH (@ 20C)	N/A	NC			
Saturation pH (@ 4C)	N/A	NC			
Inorganics					
Total Alkalinity (Total as CaCO ₃)	mg/L	ND	5.0		
Dissolved Chloride (Cl ⁻)	mg/L	4.2	1.0		
Colour	TCU	220 (1)	25		
Nitrate + Nitrite (N)	mg/L	ND	0.050		
Nitrite (N)	mg/L	ND	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L	0.057	0.050		
Total Organic Carbon (C)	mg/L	18	0.50		
Orthophosphate (P)	mg/L	ND	0.010		
pH	pH	5.77 (2)	N/A	5.40	N/A
Reactive Silica (SiO ₂)	mg/L	2.5	0.50		
Dissolved Sulphate (SO ₄)	mg/L	ND	2.0		
Turbidity	NTU	1.3	0.10	1.2	0.10
Conductivity	uS/cm	26	1.0	26	1.0

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 ND = Not detected
 (1) Elevated reporting limit due to sample matrix.
 (2) pH duplicates do not meet laboratory acceptance criteria, insufficient sample volume for repeat analysis.

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HED800	
Sampling Date		2018/07/05 10:20	
COC Number		D 29398	
	UNITS	SW12	RDL
Metals			
Dissolved Mercury (Hg)	ug/L	ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013
RDL = Reportable Detection Limit ND = Not detected			

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HED800	
Sampling Date		2018/07/05 10:20	
COC Number		D 29398	
	UNITS	SW12	RDL
Metals			
Total Aluminum (Al)	ug/L	380	5.0
Total Antimony (Sb)	ug/L	ND	1.0
Total Arsenic (As)	ug/L	ND	1.0
Total Barium (Ba)	ug/L	3.0	1.0
Total Beryllium (Be)	ug/L	ND	1.0
Total Bismuth (Bi)	ug/L	ND	2.0
Total Boron (B)	ug/L	ND	50
Total Cadmium (Cd)	ug/L	0.035	0.010
Total Calcium (Ca)	ug/L	1100	100
Total Chromium (Cr)	ug/L	ND	1.0
Total Cobalt (Co)	ug/L	0.54	0.40
Total Copper (Cu)	ug/L	ND	2.0
Total Iron (Fe)	ug/L	740	50
Total Lead (Pb)	ug/L	0.57	0.50
Total Magnesium (Mg)	ug/L	360	100
Total Manganese (Mn)	ug/L	47	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0
Total Nickel (Ni)	ug/L	ND	2.0
Total Phosphorus (P)	ug/L	ND	100
Total Potassium (K)	ug/L	170	100
Total Selenium (Se)	ug/L	ND	1.0
Total Silver (Ag)	ug/L	ND	0.10
Total Sodium (Na)	ug/L	2700	100
Total Strontium (Sr)	ug/L	7.4	2.0
Total Thallium (Tl)	ug/L	ND	0.10
Total Tin (Sn)	ug/L	ND	2.0
Total Titanium (Ti)	ug/L	3.2	2.0
Total Uranium (U)	ug/L	ND	0.10
Total Vanadium (V)	ug/L	ND	2.0
Total Zinc (Zn)	ug/L	ND	5.0
RDL = Reportable Detection Limit ND = Not detected			

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.7°C
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Sample HED800 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/18
Report #: R5404095
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N5349

Received: 2018/09/10, 16:29

Sample Matrix: Water
Samples Received: 14

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	7	N/A	2018/09/13 N/A	SM 22 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	6	N/A	2018/09/14 N/A	SM 22 4500-CO2 D
Alkalinity	13	N/A	2018/09/17 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	13	N/A	2018/09/14 ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	4	N/A	2018/09/13 ATL SOP 00042	SM 23 5220D m
Chemical Oxygen Demand (COD)	3	N/A	2018/09/14 ATL SOP 00042	SM 23 5220D m
Colour	13	N/A	2018/09/17 ATL SOP 00020	SM 23 2120C m
Organic carbon - Diss (DOC) (as rec'd) (1)	7	N/A	2018/09/18 ATL SOP 00203	SM 23 5310B m
Conductance - water	7	N/A	2018/09/13 ATL SOP 00004	SM 23 2510B m
Conductance - water	6	N/A	2018/09/14 ATL SOP 00004	SM 23 2510B m
Fluoride	7	N/A	2018/09/14 ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	5	N/A	2018/09/13 ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	6	N/A	2018/09/14 ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	2	N/A	2018/09/17 ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	7	2018/09/14	2018/09/17 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	1	2018/09/13	2018/09/17 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	6	2018/09/14	2018/09/17 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	6	N/A	2018/09/13 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	5	2018/09/12	2018/09/12 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	2	2018/09/12	2018/09/15 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	13	N/A	2018/09/18 N/A	Auto Calc.
Anion and Cation Sum	13	N/A	2018/09/18 N/A	Auto Calc.
Nitrogen Ammonia - water	13	N/A	2018/09/17 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	13	N/A	2018/09/17 ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	13	N/A	2018/09/14 ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	13	N/A	2018/09/17 ATL SOP 00018	ASTM D3867-16
pH (2)	7	N/A	2018/09/13 ATL SOP 00003	SM 23 4500-H+ B m
pH (2)	6	N/A	2018/09/14 ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	13	N/A	2018/09/14 ATL SOP 00021	SM 23 4500-P E m
Salinity	7	N/A	2018/09/13	SM 22 2520B

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/18
Report #: R5404095
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N5349

Received: 2018/09/10, 16:29

Sample Matrix: Water
Samples Received: 14

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Sat. pH and Langelier Index (@ 20C)	12	N/A	2018/09/17 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	1	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	12	N/A	2018/09/17 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Reactive Silica	13	N/A	2018/09/14 ATL SOP 00022	EPA 366.0 m
Sulphate	13	N/A	2018/09/17 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	13	N/A	2018/09/18 N/A	Auto Calc.
Organic carbon - Total (TOC) (3)	3	N/A	2018/09/17 ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (3)	10	N/A	2018/09/18 ATL SOP 00203	SM 23 5310B m
Total Suspended Solids	7	2018/09/17	2018/09/18 ATL SOP 00007	SM 23 2540D m
Turbidity	13	N/A	2018/09/14 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-03-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/18
Report #: R5404095
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N5349

Received: 2018/09/10, 16:29

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (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.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====
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RESULTS OF ANALYSES OF WATER

Maxxam ID		HSD834		HSD835		HSD836		HSD837	
Sampling Date		2018/09/10 08:50		2018/09/10 08:50		2018/09/10 09:40		2018/09/10 09:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW5	RDL	SW5 FILTERED	RDL	SW12	RDL	SW12 FILTERED	RDL

Calculated Parameters									
Anion Sum	me/L	0.120	N/A	0.120	N/A	0.140	N/A	0.140	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	10	1.0	9.0	1.0	18	1.0	17	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.200	N/A	0.170	N/A	0.290	N/A	0.260	N/A
Hardness (CaCO3)	mg/L	3.1	1.0	2.6	1.0	5.1	1.0	4.3	1.0
Ion Balance (% Difference)	%	25.0	N/A	17.2	N/A	34.9	N/A	30.0	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L	20	20			49	20		
Dissolved Chloride (Cl-)	mg/L	4.2	1.0	4.2	1.0	4.9	1.0	5.1	1.0
Colour	TCU	29	5.0	24	5.0	250 (1)	50	240 (1)	25
Dissolved Fluoride (F-)	mg/L	ND	0.10			ND	0.10		
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	0.075	0.050	0.072	0.050
Dissolved Organic Carbon (C)	mg/L			4.0	0.5			17	0.5
Total Organic Carbon (C)	mg/L	4.8	0.50	3.9	0.50	17 (2)	5.0	17	0.50
Orthophosphate (P)	mg/L	0.014	0.010	0.011	0.010	ND	0.010	0.012	0.010
pH	pH	6.23	N/A	6.01	N/A	5.96	N/A	6.09	N/A
Salinity	N/A	ND	2.0			ND	2.0		
Reactive Silica (SiO2)	mg/L	1.4	0.50	1.4	0.50	6.5	0.50	6.5	0.50
Total Suspended Solids	mg/L	1.8	1.1			2.2	1.1		
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	0.82	0.10	0.22	0.10	0.96	0.10	0.62	0.10
Conductivity	uS/cm	21	1.0	21	1.0	26	1.0	27	1.0

RDL = Reportable Detection Limit
N/A = Not Applicable
ND = Not detected
(1) Elevated reporting limit due to sample matrix.
(2) Elevated reporting limit due to turbidity.

Maxxam Analytics - Environmental Water Testing

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSD838		HSD839		HSD840		HSD841	
Sampling Date		2018/09/10 10:30		2018/09/10 10:30		2018/09/10 11:30		2018/09/10 11:30	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW11	RDL	SW11 FILTERED	RDL	SW10	RDL	SW10 FILTERED	RDL

Calculated Parameters

Anion Sum	me/L	0.130	N/A	0.130	N/A	0.150	N/A	0.150	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	11	1.0	11	1.0	11	1.0	10	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.200	N/A	0.180	N/A	0.220	N/A	0.210	N/A
Hardness (CaCO3)	mg/L	3.1	1.0	2.8	1.0	3.1	1.0	2.9	1.0
Ion Balance (% Difference)	%	21.2	N/A	16.1	N/A	18.9	N/A	16.7	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L	35	20			9.5	5.0		
Dissolved Chloride (Cl-)	mg/L	4.5	1.0	4.6	1.0	5.2	1.0	5.1	1.0
Colour	TCU	110 (1)	25	80 (1)	25	15	5.0	17	5.0
Dissolved Fluoride (F-)	mg/L	ND	0.10			ND	0.10		
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Dissolved Organic Carbon (C)	mg/L			10	0.5			4.0	0.5
Total Organic Carbon (C)	mg/L	11 (2)	5.0	9.9	0.50	3.7	0.50	3.8	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
pH	pH	6.20	N/A	5.98	N/A	6.22	N/A	6.16	N/A
Salinity	N/A	ND	2.0			ND	2.0		
Reactive Silica (SiO2)	mg/L	2.2	0.50	2.2	0.50	0.74	0.50	0.77	0.50
Total Suspended Solids	mg/L	6.7	1.1			1.8	1.1		
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	2.8	0.10	0.26	0.10	0.69	0.10	0.31	0.10
Conductivity	uS/cm	25	1.0	23	1.0	24	1.0	25	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

(2) Elevated reporting limit due to turbidity.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSD842		HSD843		HSD844		HSD845	
Sampling Date		2018/09/10 12:50		2018/09/10 12:50		2018/09/10 13:40		2018/09/10 13:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW9	RDL	SW9 FILTERED	RDL	SW8	RDL	SW8 FILTERED	RDL

Calculated Parameters

Anion Sum	me/L	0.150	N/A	0.150	N/A	0.150	N/A	0.150	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	11	1.0	11	1.0	12	1.0	11	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.240	N/A	0.230	N/A	0.270	N/A	0.240	N/A
Hardness (CaCO3)	mg/L	3.5	1.0	3.2	1.0	4.1	1.0	3.5	1.0
Ion Balance (% Difference)	%	23.1	N/A	21.1	N/A	28.6	N/A	23.1	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L	10	5.0			15	5.0		
Dissolved Chloride (Cl-)	mg/L	5.2	1.0	5.5	1.0	5.2	1.0	5.4	1.0
Colour	TCU	18	5.0	11	5.0	26	5.0	24	5.0
Dissolved Fluoride (F-)	mg/L	ND	0.10			ND	0.10		
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Dissolved Organic Carbon (C)	mg/L			3.7	0.5			4.4	0.5
Total Organic Carbon (C)	mg/L	3.8	0.50	3.8	0.50	5.7 (1)	5.0	4.6	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
pH	pH	6.37	N/A	6.35	N/A	6.41	N/A	6.39	N/A
Salinity	N/A	ND	2.0			ND	2.0		
Reactive Silica (SiO2)	mg/L	0.58	0.50	0.59	0.50	0.91	0.50	0.92	0.50
Total Suspended Solids	mg/L	ND	1.1			11	1.1		
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	0.62	0.10	0.19	0.10	0.50	0.10	0.19	0.10
Conductivity	uS/cm	26	1.0	27	1.0	27	1.0	28	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to turbidity.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSD846		HSD847	
Sampling Date		2018/09/10 14:10		2018/09/10 14:10	
COC Number		C#681838-03-01		C#681838-03-01	
	UNITS	SW4	RDL	SW4 FILTERED	RDL
Calculated Parameters					
Anion Sum	me/L	0.560	N/A		
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	22	1.0		
Calculated TDS	mg/L	43	1.0		
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0		
Cation Sum	me/L	0.780	N/A		
Hardness (CaCO3)	mg/L	22	1.0		
Ion Balance (% Difference)	%	16.4	N/A		
Langelier Index (@ 20C)	N/A	-2.12			
Langelier Index (@ 4C)	N/A	-2.37			
Nitrate (N)	mg/L	ND	0.050		
Saturation pH (@ 20C)	N/A	9.10			
Saturation pH (@ 4C)	N/A	9.35			
Inorganics					
Total Alkalinity (Total as CaCO3)	mg/L	22	5.0		
Total Chemical Oxygen Demand	mg/L	38	20		
Dissolved Chloride (Cl-)	mg/L	4.3	1.0		
Colour	TCU	61 (1)	25		
Dissolved Fluoride (F-)	mg/L	ND	0.10		
Nitrate + Nitrite (N)	mg/L	ND	0.050		
Nitrite (N)	mg/L	ND	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L	0.14	0.050		
Dissolved Organic Carbon (C)	mg/L			6.4	0.5
Total Organic Carbon (C)	mg/L	8.9	0.50		
Orthophosphate (P)	mg/L	0.029	0.010		
pH	pH	6.99	N/A		
Salinity	N/A	ND	2.0		
Reactive Silica (SiO2)	mg/L	6.5	0.50		
Total Suspended Solids	mg/L	18	2.0		
Dissolved Sulphate (SO4)	mg/L	ND	2.0		
Turbidity	NTU	9.3	0.10		
Conductivity	uS/cm	59	1.0		
RDL = Reportable Detection Limit N/A = Not Applicable ND = Not detected (1) Elevated reporting limit due to sample matrix.					

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HSD834		HSD835		HSD836		HSD837	
Sampling Date		2018/09/10 08:50		2018/09/10 08:50		2018/09/10 09:40		2018/09/10 09:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW5	RDL	SW5 FILTERED	RDL	SW12	RDL	SW12 FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam ID		HSD838		HSD839		HSD840		HSD841	
Sampling Date		2018/09/10 10:30		2018/09/10 10:30		2018/09/10 11:30		2018/09/10 11:30	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW11	RDL	SW11 FILTERED	RDL	SW10	RDL	SW10 FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam ID		HSD842		HSD843		HSD844		HSD845	
Sampling Date		2018/09/10 12:50		2018/09/10 12:50		2018/09/10 13:40		2018/09/10 13:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW9	RDL	SW9 FILTERED	RDL	SW8	RDL	SW8 FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam ID		HSD846		HSD847	
Sampling Date		2018/09/10 14:10		2018/09/10 14:10	
COC Number		C#681838-03-01		C#681838-03-01	
	UNITS	SW4	RDL	SW4 FILTERED	RDL

Metals					
Dissolved Mercury (Hg)	ug/L			ND	0.013
Total Mercury (Hg)	ug/L	0.018	0.013		
RDL = Reportable Detection Limit ND = Not detected					

Maxxam Analytics - Environmental Data Reporting

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD834		HSD835		HSD836		HSD837	
Sampling Date		2018/09/10 08:50		2018/09/10 08:50		2018/09/10 09:40		2018/09/10 09:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW5	RDL	SW5 FILTERED	RDL	SW12	RDL	SW12 FILTERED	RDL
Metals									
Dissolved Aluminum (Al)	ug/L			58	5.0			280	5.0
Total Aluminum (Al)	ug/L	87	5.0			320	5.0		
Dissolved Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Total Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Dissolved Arsenic (As)	ug/L			57	1.0			1.3	1.0
Total Arsenic (As)	ug/L	77	1.0			1.5	1.0		
Dissolved Barium (Ba)	ug/L			2.2	1.0			2.9	1.0
Total Barium (Ba)	ug/L	2.4	1.0			3.2	1.0		
Dissolved Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Total Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Dissolved Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Total Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Dissolved Boron (B)	ug/L			ND	50			ND	50
Total Boron (B)	ug/L	ND	50			ND	50		
Dissolved Cadmium (Cd)	ug/L			ND	0.010			0.014	0.010
Total Cadmium (Cd)	ug/L	0.020	0.010			0.018	0.010		
Dissolved Calcium (Ca)	ug/L			530	100			1100	100
Total Calcium (Ca)	ug/L	660	100			1400	100		
Dissolved Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Total Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Dissolved Cobalt (Co)	ug/L			ND	0.40			ND	0.40
Total Cobalt (Co)	ug/L	ND	0.40			0.46	0.40		
Dissolved Copper (Cu)	ug/L			ND	2.0			ND	2.0
Total Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Dissolved Iron (Fe)	ug/L			290	50			850	50
Total Iron (Fe)	ug/L	610	50			1200	50		
Dissolved Lead (Pb)	ug/L			ND	0.50			ND	0.50
Total Lead (Pb)	ug/L	ND	0.50			0.57	0.50		
Dissolved Magnesium (Mg)	ug/L			320	100			370	100
Total Magnesium (Mg)	ug/L	350	100			410	100		
Dissolved Manganese (Mn)	ug/L			66	2.0			58	2.0
Total Manganese (Mn)	ug/L	82	2.0			61	2.0		
Dissolved Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		
Dissolved Nickel (Ni)	ug/L			ND	2.0			ND	2.0
RDL = Reportable Detection Limit ND = Not detected									

Maxxam Analytics - Environmental Data Reporting

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD834		HSD835		HSD836		HSD837	
Sampling Date		2018/09/10 08:50		2018/09/10 08:50		2018/09/10 09:40		2018/09/10 09:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW5	RDL	SW5 FILTERED	RDL	SW12	RDL	SW12 FILTERED	RDL
Total Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Dissolved Phosphorus (P)	ug/L			ND	100			ND	100
Total Phosphorus (P)	ug/L	ND	100			ND	100		
Dissolved Potassium (K)	ug/L			190	100			220	100
Total Potassium (K)	ug/L	200	100			250	100		
Dissolved Selenium (Se)	ug/L			ND	1.0			ND	1.0
Total Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Dissolved Silver (Ag)	ug/L			ND	0.10			ND	0.10
Total Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Dissolved Sodium (Na)	ug/L			2400	100			3000	100
Total Sodium (Na)	ug/L	2600	100			3000	100		
Dissolved Strontium (Sr)	ug/L			5.4	2.0			7.6	2.0
Total Strontium (Sr)	ug/L	5.7	2.0			7.6	2.0		
Dissolved Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Total Thallium (Tl)	ug/L	ND	0.10			ND	0.10		
Dissolved Tin (Sn)	ug/L			ND	2.0			ND	2.0
Total Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Dissolved Titanium (Ti)	ug/L			ND	2.0			2.4	2.0
Total Titanium (Ti)	ug/L	ND	2.0			4.4	2.0		
Dissolved Uranium (U)	ug/L			ND	0.10			ND	0.10
Total Uranium (U)	ug/L	ND	0.10			ND	0.10		
Dissolved Vanadium (V)	ug/L			ND	2.0			ND	2.0
Total Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Dissolved Zinc (Zn)	ug/L			ND	5.0			ND	5.0
Total Zinc (Zn)	ug/L	ND	5.0			6.2	5.0		

RDL = Reportable Detection Limit
ND = Not detected

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ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD838		HSD839		HSD840		HSD841	
Sampling Date		2018/09/10 10:30		2018/09/10 10:30		2018/09/10 11:30		2018/09/10 11:30	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW11	RDL	SW11 FILTERED	RDL	SW10	RDL	SW10 FILTERED	RDL
Metals									
Dissolved Aluminum (Al)	ug/L			210	5.0			47	5.0
Total Aluminum (Al)	ug/L	250	5.0			77	5.0		
Dissolved Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Total Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Dissolved Arsenic (As)	ug/L			ND	1.0			ND	1.0
Total Arsenic (As)	ug/L	ND	1.0			ND	1.0		
Dissolved Barium (Ba)	ug/L			2.7	1.0			3.5	1.0
Total Barium (Ba)	ug/L	2.9	1.0			3.9	1.0		
Dissolved Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Total Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Dissolved Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Total Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Dissolved Boron (B)	ug/L			ND	50			ND	50
Total Boron (B)	ug/L	ND	50			ND	50		
Dissolved Cadmium (Cd)	ug/L			0.012	0.010			ND	0.010
Total Cadmium (Cd)	ug/L	0.014	0.010			ND	0.010		
Dissolved Calcium (Ca)	ug/L			570	100			590	100
Total Calcium (Ca)	ug/L	670	100			650	100		
Dissolved Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Total Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Dissolved Cobalt (Co)	ug/L			ND	0.40			ND	0.40
Total Cobalt (Co)	ug/L	ND	0.40			ND	0.40		
Dissolved Copper (Cu)	ug/L			ND	2.0			ND	2.0
Total Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Dissolved Iron (Fe)	ug/L			200	50			63	50
Total Iron (Fe)	ug/L	370	50			130	50		
Dissolved Lead (Pb)	ug/L			ND	0.50			ND	0.50
Total Lead (Pb)	ug/L	ND	0.50			ND	0.50		
Dissolved Magnesium (Mg)	ug/L			330	100			350	100
Total Magnesium (Mg)	ug/L	340	100			370	100		
Dissolved Manganese (Mn)	ug/L			34	2.0			25	2.0
Total Manganese (Mn)	ug/L	37	2.0			32	2.0		
Dissolved Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		
Dissolved Nickel (Ni)	ug/L			ND	2.0			ND	2.0
RDL = Reportable Detection Limit ND = Not detected									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD838		HSD839		HSD840		HSD841	
Sampling Date		2018/09/10 10:30		2018/09/10 10:30		2018/09/10 11:30		2018/09/10 11:30	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW11	RDL	SW11 FILTERED	RDL	SW10	RDL	SW10 FILTERED	RDL
Total Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Dissolved Phosphorus (P)	ug/L			ND	100			ND	100
Total Phosphorus (P)	ug/L	ND	100			ND	100		
Dissolved Potassium (K)	ug/L			170	100			280	100
Total Potassium (K)	ug/L	200	100			330	100		
Dissolved Selenium (Se)	ug/L			ND	1.0			ND	1.0
Total Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Dissolved Silver (Ag)	ug/L			ND	0.10			ND	0.10
Total Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Dissolved Sodium (Na)	ug/L			2600	100			3200	100
Total Sodium (Na)	ug/L	2800	100			3200	100		
Dissolved Strontium (Sr)	ug/L			5.9	2.0			5.0	2.0
Total Strontium (Sr)	ug/L	6.0	2.0			5.4	2.0		
Dissolved Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Total Thallium (Tl)	ug/L	0.16	0.10			ND	0.10		
Dissolved Tin (Sn)	ug/L			ND	2.0			ND	2.0
Total Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Dissolved Titanium (Ti)	ug/L			ND	2.0			ND	2.0
Total Titanium (Ti)	ug/L	3.0	2.0			ND	2.0		
Dissolved Uranium (U)	ug/L			ND	0.10			ND	0.10
Total Uranium (U)	ug/L	ND	0.10			ND	0.10		
Dissolved Vanadium (V)	ug/L			ND	2.0			ND	2.0
Total Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Dissolved Zinc (Zn)	ug/L			ND	5.0			ND	5.0
Total Zinc (Zn)	ug/L	ND	5.0			ND	5.0		

RDL = Reportable Detection Limit
ND = Not detected

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ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD842		HSD843		HSD844		HSD845	
Sampling Date		2018/09/10 12:50		2018/09/10 12:50		2018/09/10 13:40		2018/09/10 13:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW9	RDL	SW9 FILTERED	RDL	SW8	RDL	SW8 FILTERED	RDL
Metals									
Dissolved Aluminum (Al)	ug/L			32	5.0			65	5.0
Total Aluminum (Al)	ug/L	42	5.0			160	5.0		
Dissolved Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Total Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Dissolved Arsenic (As)	ug/L			ND	1.0			ND	1.0
Total Arsenic (As)	ug/L	ND	1.0			ND	1.0		
Dissolved Barium (Ba)	ug/L			2.8	1.0			2.8	1.0
Total Barium (Ba)	ug/L	3.0	1.0			3.9	1.0		
Dissolved Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Total Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Dissolved Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Total Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Dissolved Boron (B)	ug/L			ND	50			ND	50
Total Boron (B)	ug/L	ND	50			ND	50		
Dissolved Cadmium (Cd)	ug/L			ND	0.010			ND	0.010
Total Cadmium (Cd)	ug/L	ND	0.010			0.012	0.010		
Dissolved Calcium (Ca)	ug/L			640	100			760	100
Total Calcium (Ca)	ug/L	730	100			880	100		
Dissolved Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Total Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Dissolved Cobalt (Co)	ug/L			ND	0.40			ND	0.40
Total Cobalt (Co)	ug/L	ND	0.40			0.85	0.40		
Dissolved Copper (Cu)	ug/L			ND	2.0			ND	2.0
Total Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Dissolved Iron (Fe)	ug/L			66	50			120	50
Total Iron (Fe)	ug/L	110	50			700	50		
Dissolved Lead (Pb)	ug/L			ND	0.50			ND	0.50
Total Lead (Pb)	ug/L	ND	0.50			ND	0.50		
Dissolved Magnesium (Mg)	ug/L			380	100			400	100
Total Magnesium (Mg)	ug/L	420	100			450	100		
Dissolved Manganese (Mn)	ug/L			30	2.0			35	2.0
Total Manganese (Mn)	ug/L	41	2.0			190	2.0		
Dissolved Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		
Dissolved Nickel (Ni)	ug/L			ND	2.0			ND	2.0
RDL = Reportable Detection Limit ND = Not detected									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD842		HSD843		HSD844		HSD845	
Sampling Date		2018/09/10 12:50		2018/09/10 12:50		2018/09/10 13:40		2018/09/10 13:40	
COC Number		C#681838-03-01		C#681838-03-01		C#681838-03-01		C#681838-03-01	
	UNITS	SW9	RDL	SW9 FILTERED	RDL	SW8	RDL	SW8 FILTERED	RDL
Total Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Dissolved Phosphorus (P)	ug/L			ND	100			ND	100
Total Phosphorus (P)	ug/L	ND	100			ND	100		
Dissolved Potassium (K)	ug/L			220	100			270	100
Total Potassium (K)	ug/L	240	100			300	100		
Dissolved Selenium (Se)	ug/L			ND	1.0			ND	1.0
Total Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Dissolved Silver (Ag)	ug/L			ND	0.10			ND	0.10
Total Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Dissolved Sodium (Na)	ug/L			3600	100			3600	100
Total Sodium (Na)	ug/L	3700	100			3600	100		
Dissolved Strontium (Sr)	ug/L			4.9	2.0			5.6	2.0
Total Strontium (Sr)	ug/L	5.0	2.0			6.1	2.0		
Dissolved Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Total Thallium (Tl)	ug/L	ND	0.10			ND	0.10		
Dissolved Tin (Sn)	ug/L			ND	2.0			ND	2.0
Total Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Dissolved Titanium (Ti)	ug/L			ND	2.0			ND	2.0
Total Titanium (Ti)	ug/L	ND	2.0			3.9	2.0		
Dissolved Uranium (U)	ug/L			ND	0.10			ND	0.10
Total Uranium (U)	ug/L	ND	0.10			ND	0.10		
Dissolved Vanadium (V)	ug/L			ND	2.0			ND	2.0
Total Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Dissolved Zinc (Zn)	ug/L			ND	5.0			ND	5.0
Total Zinc (Zn)	ug/L	ND	5.0			ND	5.0		

RDL = Reportable Detection Limit
ND = Not detected

Maxxam Analytics International Corporation - Bedford, Nova Scotia Canada B4B 1G9

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSD846	
Sampling Date		2018/09/10 14:10	
COC Number		C#681838-03-01	
	UNITS	SW4	RDL
Metals			
Total Aluminum (Al)	ug/L	260	5.0
Total Antimony (Sb)	ug/L	ND	1.0
Total Arsenic (As)	ug/L	340	1.0
Total Barium (Ba)	ug/L	11	1.0
Total Beryllium (Be)	ug/L	ND	1.0
Total Bismuth (Bi)	ug/L	ND	2.0
Total Boron (B)	ug/L	ND	50
Total Cadmium (Cd)	ug/L	0.011	0.010
Total Calcium (Ca)	ug/L	7300	100
Total Chromium (Cr)	ug/L	ND	1.0
Total Cobalt (Co)	ug/L	5.8	0.40
Total Copper (Cu)	ug/L	ND	2.0
Total Iron (Fe)	ug/L	4800	50
Total Lead (Pb)	ug/L	1.3	0.50
Total Magnesium (Mg)	ug/L	810	100
Total Manganese (Mn)	ug/L	1500	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0
Total Nickel (Ni)	ug/L	ND	2.0
Total Phosphorus (P)	ug/L	ND	100
Total Potassium (K)	ug/L	690	100
Total Selenium (Se)	ug/L	ND	1.0
Total Silver (Ag)	ug/L	ND	0.10
Total Sodium (Na)	ug/L	3400	100
Total Strontium (Sr)	ug/L	23	2.0
Total Thallium (Tl)	ug/L	ND	0.10
Total Tin (Sn)	ug/L	ND	2.0
Total Titanium (Ti)	ug/L	9.0	2.0
Total Uranium (U)	ug/L	ND	0.10
Total Vanadium (V)	ug/L	ND	2.0
Total Zinc (Zn)	ug/L	8.2	5.0
RDL = Reportable Detection Limit ND = Not detected			

Maxxam Analytics International Corporation - Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.7°C
Package 2	7.0°C
Package 3	1.3°C
Package 4	2.0°C

Sample HSD834 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD835 [SW5 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD836 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD837 [SW12 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD838 [SW11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD839 [SW11 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD840 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD841 [SW10 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD842 [SW9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

TSS:Used all of the sample provided, DL raised.

Sample HSD843 [SW9 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD844 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD845 [SW8 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD846 [SW4] : RCap Ion Balance acceptable. Low ionic strength sample.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Eric Dearman, Scientific Specialist



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation - Bedford, Nova Scotia, Canada



Maxxam Analytics International Corporation via Maxxam Analytics
 200 Bluewater Road, Bridgetown, Nova Scotia Canada B4B 1G9 Tel: (902) 420-0203 Toll Free: 800-563-6266 Fax: (902) 420-8612 www.maxxam.ca

Chain Of Custody Record

Page 1 of 1

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Customer #: B83573	Maxxam Job #: B8N5349	Bottle Order #:			
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner/ Jim Millard	P.O. #:	Fifteen Mile Stream	Project Manager:			
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project Name:		Chain of Custody Record:			
Middle Musquodoboit NS B0N 1X0	Bedford NS B4B 1G7	Site #:		Sampled By:			
Phone: (902) 384-2772	Phone: (902) 680-6375						
Fax: (902) 384-2772	Fax: (902) 680-6375						
E-mail: accounts@atlanticgoldcorporation.com	E-mail: ryan@mcCallumenvironmental.com						

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:			
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Sewerwater/Potable/Nonpotable/Tissue/Solid/Sediment/Metal		Field Filtered & Preserved	Lab Filtration Required	Aluminum RCAP-MS Total Metals in Water	All RCAP-MS Dissolved (Field/Filt) in W	Mercury - Total (CVAA/LL)	Mercury - Dissolved (CVAA/LL)	Organic carbon - Diss (DOC) (as rec'd)	Methymercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are + 5 days - contact your Project Manager for details. Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____	
UNACCEPTABLE RISK: LOSS OF DATA FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM															

Sample Barcode Label	Sample Location Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Aluminum RCAP-MS Total Metals in Water	All RCAP-MS Dissolved (Field/Filt) in W	Mercury - Total (CVAA/LL)	Mercury - Dissolved (CVAA/LL)	Organic carbon - Diss (DOC) (as rec'd)	Methymercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	# of Bottles	Comments / Remarks / Other Required Analysis	
1	SWS	18/09/10	8:50	H ₂ O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2	SW12	"	9:40	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3	SW11	"	10:30	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
4	SW10	"	11:30	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5	SW9	"	12:50	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6	SW8	"	13:40	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7	SW4	"	14:10	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8																			
9																			
10																			

RELINQUISHED BY: (Signature/Print)	Date: (YYMMDD)	Time	RECEIVED BY: (Signature/Print)	Date: (YYMMDD)	Time	# Jars used and not submitted	Lab Use Only
	18/09/10	1630					Time Sensitive: <input type="checkbox"/> Temperature (°C) on Receipt: 11, 4, 11, 9, 0, 12 Custody Seal Intact on Cooler?: <input type="checkbox"/> Yes <input type="checkbox"/> No White Maxxam Yellow Crest 7, -1, 2/0, 5, 1

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEW AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-03-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/24

Report #: R5413027

Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N5349

Received: 2018/09/10, 16:29

Sample Matrix: Water
Samples Received: 7

Analyses	Date		Laboratory Method	Reference
	Quantity Extracted	Analyzed		
Chlorophyll A (Sub from Bedford) (1)	7	2018/09/11 2018/09/19		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Dalhousie Dept of Oceanography

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-03-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/24
Report #: R5413027
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N5349
Received: 2018/09/10, 16:29

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSD834	HSD836	HSD838	HSD840	HSD842	HSD844
Sampling Date		2018/09/10 08:50	2018/09/10 09:40	2018/09/10 10:30	2018/09/10 11:30	2018/09/10 12:50	2018/09/10 13:40
COC Number		C#681838-03-01	C#681838-03-01	C#681838-03-01	C#681838-03-01	C#681838-03-01	C#681838-03-01
	UNITS	SW5	SW12	SW11	SW10	SW9	SW8

Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED

Maxxam ID		HSD846
Sampling Date		2018/09/10 14:10
COC Number		C#681838-03-01
	UNITS	SW4

Subcontracted Analysis		
Subcontract Parameter	N/A	ATTACHED

Maxxam Analytics International Corporation - Bedford, Nova Scotia

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.7°C
Package 2	7.0°C
Package 3	1.3°C
Package 4	2.0°C

Sample HSD834 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD835 [SW5 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD836 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD837 [SW12 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD838 [SW11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD839 [SW11 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD840 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD841 [SW10 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD842 [SW9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

TSS:Used all of the sample provided, DL raised.

Sample HSD843 [SW9 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD844 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD845 [SW8 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSD846 [SW4] : RCap Ion Balance acceptable. Low ionic strength sample.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Eric Dearman, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation - Bedford, Nova Scotia Canada B4B 1G9



Dalhousie University

Department of Oceanography
Halifax, N.S.
B3H 4R2

Maxxam Analytics Inc., 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Re: Determination of chlorophyll a in algae by fluorescence

Maxxam Project#: B8N5349

Acidification Technique:

Sample ID	Client ID	Chl a ($\mu\text{g L}^{-1}$)
HSD834-02R	SW5	0.69
HSD836-02R	SW12	2.26
HSD838-02R	SW11	4.08
HSD840-02R	SW10	2.51
HSD842-02R	SW9	1.19
HSD844-02R	SW8	1.06
HSD846-02R	SW4	5.41

- Chl a = chlorophyll a

Received: September 11, 2018

Completed: September 19, 2018

Hugh MacIntyre Ph.D.



Maxxam Analytics International Corporation via Maxxam Analytics
 200 Bluewater Road, Bridgetown, Nova Scotia Canada B4D 1G9 Tel: (902) 420-0203 Toll-free: 800-563-6266 Fax: (902) 420-8612 www.maxxam.ca

Chain Of Custody Record

Page 1 of 1

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Customer #: B83573	Maxxam Job #: B8N5349	Bottle Order #:			
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner/ Jim Millard	P.O. #:	Fifteen Mile Stream	Project Manager:			
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project #:		Chain of Custody Record:			
Middle Musquodoboit NS B0N 1X0	Bedford NS B4B 1G7	Project Name:					
Phone: (902) 384-2772 Fax: (902) 384-2772	Phone: (902) 680-6375	Site #:		Sampled By:			
Email: accounts@atlanticgoldcorporation.com	Email: ryans@mccallumenvironmental.com						

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:			
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater/Potable/Nonpotable/Tissue/Solid/Sediment/Metal		Field Filtered & Preserved	Lab Filtration Required	Asiatic RCAP-MS Total Metals in Water	All RCAP-MS Dissolved (Field/Filt) in W	Mercury - Total (CVAA/LL)	Mercury - Dissolved (CVAA/LL)	Organic carbon - Diss (DOC) (as rec'd)	Methymercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	<input type="checkbox"/> Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dissolved Furans are + 5 days - contact your Project Manager for details. <input type="checkbox"/> Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ <input type="checkbox"/>	
SAMPLED AT: 10:00 AM COOL IN 300L FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM															

Sample Barcode Label	Sample Location Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Asiatic RCAP-MS Total Metals in Water	All RCAP-MS Dissolved (Field/Filt) in W	Mercury - Total (CVAA/LL)	Mercury - Dissolved (CVAA/LL)	Organic carbon - Diss (DOC) (as rec'd)	Methymercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	# of Bottles	Comments / Remarks / Other Required Analysis
1	SWS	18/09/10	8:50	H ₂ O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2	SW12	"	9:40	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3	SW11	"	10:30	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
4	SW10	"	11:30	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5	SW9	"	12:50	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6	SW8	"	13:40	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
7	SW4	"	14:10	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8																		
9																		
10																		

RELINQUISHED BY: (Signature/Print)	Date: (YYMMDD)	Time	RECEIVED BY: (Signature/Print)	Date: (YYMMDD)	Time	# Jars used and not submitted	Lab Use Only
	18/09/10	1630					Time Sensitive: <input type="checkbox"/> Temperature (°C) on Receipt: 11, 4, 11, 9, 0, 12 Custody Seal Intact on Cooler?: <input type="checkbox"/> Yes <input type="checkbox"/> No White Maxxam Yellow Crest 7, -1, 2/0, 5, 1

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEW AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Attention: Maryann Comeau

Fax #:

MComeau@maxxam.ca; bclientsvcsubcontr@maxxam.ca

Project #: B8N5349

Methylmercury Analysis in Water

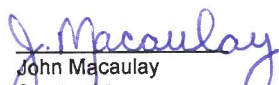
Analytes:				Methylmercury
Units:				µg/L
RL:				0.004
RPC Sample ID	Client Sample ID	Date Sampled	Matrix	< 0.004
288978-1	HSD834-01R\SW5	10-Sep-18	water	< 0.004
288978-2	HSD836-01R\SW12	10-Sep-18	water	< 0.004
288978-3	HSD838-01R\SW11	10-Sep-18	water	< 0.004
288978-4	HSD840-01R\SW10	10-Sep-18	water	< 0.004
288978-5	HSD842-01R\SW9	10-Sep-18	water	< 0.004
288978-6	HSD844-01R\SW8	10-Sep-18	water	< 0.004
288978-7	HSD846-01R\SW4	10-Sep-18	water	< 0.004
Method Blank	-	-	water	< 0.004
Spike Rec. (%)	-	-	water	91

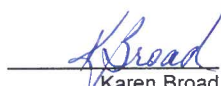
This report relates only to the sample(s) and information provided to the laboratory.

Method: Solvent extraction, derivatization, followed by GC/MS analysis.

RL = Reporting Limit

Methylmercury analysed as ethylated methylmercury.


John Macaulay
Section Manager
Organic Analytical Services


Karen Broad
Chemist
Organic Analytical Services

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/19

Report #: R5405906

Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N6894

Received: 2018/09/12, 11:44

Sample Matrix: Water
Samples Received: 4

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	1	N/A	2018/09/13 N/A	SM 22 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	3	N/A	2018/09/14 N/A	SM 22 4500-CO2 D
Alkalinity	4	N/A	2018/09/17 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	4	N/A	2018/09/17 ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	2	N/A	2018/09/13 ATL SOP 00042	SM 23 5220D m
Colour	4	N/A	2018/09/18 ATL SOP 00020	SM 23 2120C m
Organic carbon - Diss (DOC) (as rec'd) (1)	2	N/A	2018/09/19 ATL SOP 00203	SM 23 5310B m
Conductance - water	1	N/A	2018/09/13 ATL SOP 00004	SM 23 2510B m
Conductance - water	3	N/A	2018/09/14 ATL SOP 00004	SM 23 2510B m
Fluoride	2	N/A	2018/09/14 ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	2	N/A	2018/09/17 ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	2	N/A	2018/09/19 ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	2	2018/09/14	2018/09/17 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	2	2018/09/17	2018/09/18 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	2	N/A	2018/09/18 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	2	2018/09/14	2018/09/14 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	2	N/A	2018/09/18 N/A	Auto Calc.
Ion Balance (% Difference)	2	N/A	2018/09/19 N/A	Auto Calc.
Anion and Cation Sum	2	N/A	2018/09/18 N/A	Auto Calc.
Anion and Cation Sum	2	N/A	2018/09/19 N/A	Auto Calc.
Nitrogen Ammonia - water	4	N/A	2018/09/18 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	4	N/A	2018/09/18 ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	4	N/A	2018/09/17 ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	4	N/A	2018/09/18 ATL SOP 00018	ASTM D3867-16
pH (2)	1	N/A	2018/09/13 ATL SOP 00003	SM 23 4500-H+ B m
pH (2)	3	N/A	2018/09/14 ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	4	N/A	2018/09/17 ATL SOP 00021	SM 23 4500-P E m
Salinity	2	N/A	2018/09/13	SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	2	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	2	N/A	2018/09/19 ATL SOP 00049	Auto Calc.

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-01-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/19
Report #: R5405906
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N6894

Received: 2018/09/12, 11:44

Sample Matrix: Water
Samples Received: 4

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Sat. pH and Langelier Index (@ 4C)	2	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	2	N/A	2018/09/19 ATL SOP 00049	Auto Calc.
Reactive Silica	4	N/A	2018/09/18 ATL SOP 00022	EPA 366.0 m
Sulphate	4	N/A	2018/09/18 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	2	N/A	2018/09/18 N/A	Auto Calc.
Total Dissolved Solids (TDS calc)	2	N/A	2018/09/19 N/A	Auto Calc.
Organic carbon - Total (TOC) (3)	2	N/A	2018/09/18 ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (3)	2	N/A	2018/09/19 ATL SOP 00203	SM 23 5310B m
Total Suspended Solids	2	2018/09/17	2018/09/18 ATL SOP 00007	SM 23 2540D m
Turbidity	1	N/A	2018/09/13 ATL SOP 00011	EPA 180.1 R2 m
Turbidity	3	N/A	2018/09/14 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-01-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/19
Report #: R5405906
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N6894

Received: 2018/09/12, 11:44

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (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.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSM324		HSM325		HSM326		HSM327	
Sampling Date		2018/09/11 08:45		2018/09/11 08:45		2018/09/11 09:00		2018/09/11 09:00	
COC Number		C#681838-01-01		C#681838-01-01		C#681838-01-01		C#681838-01-01	
	UNITS	SW 6	RDL	SW 6 FILTERED	RDL	DUPLICATE	RDL	DUPLICATE FILTERED	RDL

Calculated Parameters									
Anion Sum	me/L	0.150	N/A	0.160	N/A	0.160	N/A	0.160	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	13	1.0	12	1.0	13	1.0	12	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.270	N/A	0.220	N/A	0.260	N/A	0.230	N/A
Hardness (CaCO3)	mg/L	3.4	1.0	3.2	1.0	3.3	1.0	3.2	1.0
Ion Balance (% Difference)	%	28.6	N/A	15.8	N/A	23.8	N/A	18.0	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L	26	20			28	20		
Dissolved Chloride (Cl-)	mg/L	5.4	1.0	5.6	1.0	5.5	1.0	5.6	1.0
Colour	TCU	59 (1)	25	52 (1)	25	60 (1)	25	56 (1)	25
Dissolved Fluoride (F-)	mg/L	ND	0.10			ND	0.10		
Nitrate + Nitrite (N)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Dissolved Organic Carbon (C)	mg/L			6.0	0.5			6.1	0.5
Total Organic Carbon (C)	mg/L	7.4	0.50	5.9	0.50	7.8	0.50	6.0	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
pH	pH	6.25	N/A	6.09	N/A	6.18	N/A	6.32	N/A
Salinity	N/A	ND	2.0			ND	2.0		
Reactive Silica (SiO2)	mg/L	1.6	0.50	1.6	0.50	1.6	0.50	1.6	0.50
Total Suspended Solids	mg/L	14	2.5			13	3.3		
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	7.0	0.10	0.52	0.10	5.0	0.10	0.19	0.10
Conductivity	uS/cm	25	1.0	26	1.0	25	1.0	26	1.0

RDL = Reportable Detection Limit
 N/A = Not Applicable
 ND = Not detected
 (1) Elevated reporting limit due to sample matrix.

Maxxam Analytics - Potable Water Testing

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HSM324		HSM325		HSM326		HSM327	
Sampling Date		2018/09/11 08:45		2018/09/11 08:45		2018/09/11 09:00		2018/09/11 09:00	
COC Number		C#681838-01-01		C#681838-01-01		C#681838-01-01		C#681838-01-01	
	UNITS	SW 6	RDL	SW 6 FILTERED	RDL	DUPLICATE	RDL	DUPLICATE FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	0.013	0.013			ND	0.013		

RDL = Reportable Detection Limit
ND = Not detected

Maxxam Analytics International Corporation - Environmental & Water Resources

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSM324		HSM325		HSM326		HSM327	
Sampling Date		2018/09/11 08:45		2018/09/11 08:45		2018/09/11 09:00		2018/09/11 09:00	
COC Number		C#681838-01-01		C#681838-01-01		C#681838-01-01		C#681838-01-01	
	UNITS	SW 6	RDL	SW 6 FILTERED	RDL	DUPLICATE	RDL	DUPLICATE FILTERED	RDL

Metals									
Dissolved Aluminum (Al)	ug/L			95	5.0			97	5.0
Total Aluminum (Al)	ug/L	280	5.0			280	5.0		
Dissolved Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Total Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Dissolved Arsenic (As)	ug/L			7.6	1.0			7.7	1.0
Total Arsenic (As)	ug/L	21	1.0			21	1.0		
Dissolved Barium (Ba)	ug/L			3.0	1.0			3.1	1.0
Total Barium (Ba)	ug/L	3.9	1.0			3.5	1.0		
Dissolved Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Total Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Dissolved Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Total Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Dissolved Boron (B)	ug/L			ND	50			ND	50
Total Boron (B)	ug/L	ND	50			ND	50		
Dissolved Cadmium (Cd)	ug/L			ND	0.010			ND	0.010
Total Cadmium (Cd)	ug/L	0.014	0.010			0.010	0.010		
Dissolved Calcium (Ca)	ug/L			720	100			740	100
Total Calcium (Ca)	ug/L	750	100			730	100		
Dissolved Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Total Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Dissolved Cobalt (Co)	ug/L			ND	0.40			ND	0.40
Total Cobalt (Co)	ug/L	ND	0.40			ND	0.40		
Dissolved Copper (Cu)	ug/L			ND	2.0			ND	2.0
Total Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Dissolved Iron (Fe)	ug/L			360	50			350	50
Total Iron (Fe)	ug/L	1300	50			1300	50		
Dissolved Lead (Pb)	ug/L			ND	0.50			ND	0.50
Total Lead (Pb)	ug/L	0.75	0.50			0.75	0.50		
Dissolved Magnesium (Mg)	ug/L			340	100			340	100
Total Magnesium (Mg)	ug/L	370	100			360	100		
Dissolved Manganese (Mn)	ug/L			57	2.0			59	2.0
Total Manganese (Mn)	ug/L	68	2.0			68	2.0		
Dissolved Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0
Total Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		

RDL = Reportable Detection Limit
ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSM324		HSM325		HSM326		HSM327	
Sampling Date		2018/09/11 08:45		2018/09/11 08:45		2018/09/11 09:00		2018/09/11 09:00	
COC Number		C#681838-01-01		C#681838-01-01		C#681838-01-01		C#681838-01-01	
	UNITS	SW 6	RDL	SW 6 FILTERED	RDL	DUPLICATE	RDL	DUPLICATE FILTERED	RDL
Dissolved Nickel (Ni)	ug/L			ND	2.0			ND	2.0
Total Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Dissolved Phosphorus (P)	ug/L			ND	100			ND	100
Total Phosphorus (P)	ug/L	ND	100			ND	100		
Dissolved Potassium (K)	ug/L			250	100			270	100
Total Potassium (K)	ug/L	260	100			240	100		
Dissolved Selenium (Se)	ug/L			ND	1.0			ND	1.0
Total Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Dissolved Silver (Ag)	ug/L			ND	0.10			ND	0.10
Total Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Dissolved Sodium (Na)	ug/L			3200	100			3300	100
Total Sodium (Na)	ug/L	3400	100			3200	100		
Dissolved Strontium (Sr)	ug/L			6.8	2.0			7.6	2.0
Total Strontium (Sr)	ug/L	6.1	2.0			5.7	2.0		
Dissolved Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Total Thallium (Tl)	ug/L	ND	0.10			ND	0.10		
Dissolved Tin (Sn)	ug/L			ND	2.0			ND	2.0
Total Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Dissolved Titanium (Ti)	ug/L			2.4	2.0			2.4	2.0
Total Titanium (Ti)	ug/L	11	2.0			11	2.0		
Dissolved Uranium (U)	ug/L			ND	0.10			ND	0.10
Total Uranium (U)	ug/L	ND	0.10			ND	0.10		
Dissolved Vanadium (V)	ug/L			ND	2.0			ND	2.0
Total Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Dissolved Zinc (Zn)	ug/L			5.1	5.0			ND	5.0
Total Zinc (Zn)	ug/L	ND	5.0			ND	5.0		
RDL = Reportable Detection Limit ND = Not detected									

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
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Sample HSM324 [SW 6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM325 [SW 6 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM326 [DUPLICATE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM327 [DUPLICATE FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

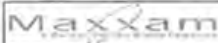
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Maxxam Analytics International Corporation via Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel: (902) 420-0263 Toll-free: 800-563-6266 Fax: (902) 420-8612 www.maxxam.ca

Chain Of Custody Record

Page of

INVOICE TO		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Quotation #: B83573	Maxxam Job #: B8N6894	Bottle Order #:	681638		
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner/ Jim Millard	P.O. #:	Fifteen Mile Stream		Chain Of Custody Record		
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project #:			Project Manager		
Middle Musquodoboit NS B0N 1X0	Bedford NS B4B 1G7	Project Name:			Maryann Corbett		
Phone: (902) 384-2772 Fax: (902) 384-2772	Phone: (902) 880-6375 Fax:	Site #:			C4951638-01-01		
Email: accounts@atlanticgoldcorporation.com	Email: ryan@miccallumenvironmental.com	Sampled By:					

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)												Turnaround Time (TAT) Required:	
** Specify Matrix: Surface/Ground Tapwater/Sewage/Effluent/Seawater Pondwater/Nonpotable/Tissue/Soil/Sediment/Metal		Field Filtered & Preserved Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Al. RCAP-MS Dissolved (Field/Filter) in W	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as rec'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	Please provide advance notice for rush projects		
SAMPLER MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM												Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as DOC and Dioxins/Furans are > 5 days - contact your Project Manager for details.			
												Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____			
												# of Bottles	Comments / Hazards / Other Required Analysis		

Sample Barcode Label	Sample Location Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Al. RCAP-MS Dissolved (Field/Filter) in W	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as rec'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 6	18/09/11	8:45	H ₂ O	/	/	/	/	/	/	/	/	/	/	/		
2	Duplicate	"	9:00	"	/	/	/	/	/	/	/	/	/	/	/		
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

RELINQUISHED BY: (Signature/Print)	Date: (YYMMDD)	Time	RECEIVED BY: (Signature/Print)	Date: (YYMMDD)	Time	# jars used and not submitted	Lab Use Only	
<i>R. [Signature]</i>	18/09/11	16:30	<i>[Signature]</i>				Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt: 10.1.1
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.							Custody Seal Intact on Container? <input type="checkbox"/> Yes <input type="checkbox"/> No	
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.							Write Maxxam Yellow Card	

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-01-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/10/01
Report #: R5422810
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N6894

Received: 2018/09/12, 11:44

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Chlorophyll A (Sub from Bedford) (1)	2	2018/09/13	2018/09/19		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Dalhousie Dept of Oceanography

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-01-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/10/01
Report #: R5422810
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N6894
Received: 2018/09/12, 11:44

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSM324	HSM326
Sampling Date		2018/09/11 08:45	2018/09/11 09:00
COC Number		C#681838-01-01	C#681838-01-01
	UNITS	SW 6	DUPLICATE
Subcontracted Analysis			
Subcontract Parameter	N/A	ATTACHED	ATTACHED

Maxxam Analytics International Corporation - 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
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Sample HSM324 [SW 6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM325 [SW 6 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM326 [DUPLICATE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSM327 [DUPLICATE FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Eric Dearman, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Dalhousie University

Department of Oceanography
Halifax, N.S.
B3H 4R2

Maxxam Analytics Inc., 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Re: Determination of chlorophyll a in algae by fluorescence

Maxxam Project#: B8N6894

Acidification Technique:

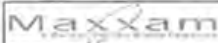
Sample ID	Client ID	Chl a ($\mu\text{g L}^{-1}$)
HSM324-02R	SW6	3.25
HSM326-02R	DUPLICATE	2.54

- **Chl a = chlorophyll a**

Received: September 13, 2018

Completed: September 19, 2018

Hugh MacIntyre Ph.D.



Maxxam Analytics International Corporation via Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel: (902) 420-0263 Toll-free: 800-563-6266 Fax: (902) 420-8612 www.maxxam.ca

Chain Of Custody Record

Page of

INVOICE TO		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Quotation #: B83573	Maxxam Job #: B8N6894	Bottle Order #:	681638		
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner/ Jim Millard	P.O. #:	Fifteen Mile Stream		Chain Of Custody Record		
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project #:			Project Manager		
Middle Musquodoboit NS B0N 1X0	Bedford NS B4B 1G7	Project Name:			Maryann Corbett		
Phone: (902) 384-2772 Fax: (902) 384-2772	Phone: (902) 880-6375 Fax:	Site #:			C4951638-01-01		
Email: accounts@atlanticgoldcorporation.com	Email: ryan@miccallumenvironmental.com	Sampled By:					

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)												Turnaround Time (TAT) Required:	
** Specify Matrix: Surface/Ground Tapwater/Sewage/Effluent/Seawater Pondwater/Nonpotable/Tissue/Soil/Sediment/Metal		Field Filtered & Preserved Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Al. RCAP-MS Dissolved (Field/Filter) in Water	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as rec'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	Please provide advance notice for rush projects		
SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM												Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as DOC and Dioxins/Furans are > 5 days - contact your Project Manager for details.			
												Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____			
												# of Bottles	Comments / Hazards / Other Required Analysis		

Sample Barcode Label	Sample Location Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Al. RCAP-MS Dissolved (Field/Filter) in Water	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as rec'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity + Total Suspended Solids	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 6	18/09/11	8:45	H ₂ O	/	/	/	/	/	/	/	/	/	/	/		
2	Duplicate	"	9:00	"	/	/	/	/	/	/	/	/	/	/	/		
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

RELINQUISHED BY: (Signature/Print)	Date: (YYMMDD)	Time	RECEIVED BY: (Signature/Print)	Date: (YYMMDD)	Time	# jars used and not submitted	Lab Use Only	
<i>R. [Signature]</i>	18/09/11	16:30	<i>[Signature]</i>				Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt: 10.1.1
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.							Custody Seal Intact on Container? <input type="checkbox"/> Yes <input type="checkbox"/> No	
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.							Write Maxxam Yellow Card	

Attention: Maryann Comeau

Fax #:

MComeau@maxxam.ca; bclientsvcsubcontr@maxxam.ca

Project #: B8N6894

Methylmercury Analysis in Water

Analytes:				Methylmercury
Units:				µg/L
RL:				0.004
RPC Sample ID	Client Sample ID	Date Sampled	Matrix	
289254-1	HSM324-01R\SW6	11-Sep-18	water	< 0.004
289254-2	HSM326-01R\DUPLICATE	11-Sep-18	water	< 0.004
Method Blank	-	-	water	< 0.004
Spike Rec. (%)	-	-	water	103


This report relates only to the sample(s) and information provided to the laboratory.

Method: Solvent extraction, derivatization, followed by GC/MS analysis.

RL = Reporting Limit

Methylmercury analysed as ethylated methylmercury.


John Macaulay
Section Manager
Organic Analytical Services


Karen Broad
Chemist
Organic Analytical Services

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/20

Report #: R5407657

Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N8200

Received: 2018/09/12, 16:22

Sample Matrix: Water
Samples Received: 15

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	12	N/A	2018/09/14 N/A	SM 22 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	3	N/A	2018/09/17 N/A	SM 22 4500-CO2 D
Alkalinity	10	N/A	2018/09/17 ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	5	N/A	2018/09/18 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	12	N/A	2018/09/17 ATL SOP 00014	SM 23 4500-Cl- E m
Chloride	3	N/A	2018/09/18 ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	2	N/A	2018/09/13 ATL SOP 00042	SM 23 5220D m
Chemical Oxygen Demand (COD)	1	N/A	2018/09/14 ATL SOP 00042	SM 23 5220D m
Chemical Oxygen Demand (COD)	2	N/A	2018/09/18 ATL SOP 00042	SM 23 5220D m
Chemical Oxygen Demand (COD)	1	N/A	2018/09/19 ATL SOP 00042	SM 23 5220D m
Colour	12	N/A	2018/09/18 ATL SOP 00020	SM 23 2120C m
Colour	3	N/A	2018/09/19 ATL SOP 00020	SM 23 2120C m
Organic carbon - Diss (DOC) (as rec'd) (1)	7	N/A	2018/09/20 ATL SOP 00203	SM 23 5310B m
Conductance - water	12	N/A	2018/09/14 ATL SOP 00004	SM 23 2510B m
Conductance - water	3	N/A	2018/09/17 ATL SOP 00004	SM 23 2510B m
Fluoride	4	N/A	2018/09/14 ATL SOP 00043	SM 23 4500-F- C m
Fluoride	2	N/A	2018/09/17 ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	11	N/A	2018/09/17 ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	4	N/A	2018/09/18 ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	3	2018/09/14	2018/09/17 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Dissolved (CVAA,LL)	4	2018/09/17	2018/09/18 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	6	2018/09/17	2018/09/18 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	1	2018/09/19	2018/09/20 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	8	N/A	2018/09/15 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	3	2018/09/14	2018/09/15 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	4	2018/09/14	2018/09/18 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	15	N/A	2018/09/19 N/A	Auto Calc.
Anion and Cation Sum	15	N/A	2018/09/19 N/A	Auto Calc.
Nitrogen Ammonia - water	15	N/A	2018/09/19 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	12	N/A	2018/09/18 ATL SOP 00016	USGS I-2547-11m

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2018/09/20

Report #: R5407657

Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N8200

Received: 2018/09/12, 16:22

Sample Matrix: Water
 # Samples Received: 15

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Nitrogen - Nitrate + Nitrite	3	N/A	2018/09/19 ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	12	N/A	2018/09/17 ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrite	3	N/A	2018/09/18 ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	12	N/A	2018/09/18 ATL SOP 00018	ASTM D3867-16
Nitrogen - Nitrate (as N)	3	N/A	2018/09/19 ATL SOP 00018	ASTM D3867-16
pH (2)	12	N/A	2018/09/14 ATL SOP 00003	SM 23 4500-H+ B m
pH (2)	3	N/A	2018/09/17 ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	12	N/A	2018/09/17 ATL SOP 00021	SM 23 4500-P E m
Phosphorus - ortho	3	N/A	2018/09/19 ATL SOP 00021	SM 23 4500-P E m
Salinity	7	N/A	2018/09/13	SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	11	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	4	N/A	2018/09/19 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	11	N/A	2018/09/18 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	4	N/A	2018/09/19 ATL SOP 00049	Auto Calc.
Reactive Silica	12	N/A	2018/09/18 ATL SOP 00022	EPA 366.0 m
Reactive Silica	3	N/A	2018/09/19 ATL SOP 00022	EPA 366.0 m
Sulphate	12	N/A	2018/09/18 ATL SOP 00023	ASTM D516-16 m
Sulphate	3	N/A	2018/09/19 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	15	N/A	2018/09/19 N/A	Auto Calc.
Organic carbon - Total (TOC) (3)	2	N/A	2018/09/19 ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (3)	13	N/A	2018/09/20 ATL SOP 00203	SM 23 5310B m
Total Suspended Solids	7	2018/09/18	2018/09/20 ATL SOP 00007	SM 23 2540D m
Turbidity	2	N/A	2018/09/14 ATL SOP 00011	EPA 180.1 R2 m
Turbidity	13	N/A	2018/09/18 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-05-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/09/20
Report #: R5407657
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N8200

Received: 2018/09/12, 16:22

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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====
This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSU395		HSU396		HSU397	
Sampling Date		2018/09/12 09:00		2018/09/12 09:00		2018/09/12 09:40	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 DEPTH	RDL

Calculated Parameters

Anion Sum	me/L	0.160	N/A	0.160	N/A	0.150	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	13	1.0	12	1.0	13	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.250	N/A	0.220	N/A	0.280	N/A
Hardness (CaCO3)	mg/L	3.2	1.0	3.2	1.0	3.3	1.0
Ion Balance (% Difference)	%	22.0	N/A	15.8	N/A	30.2	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	0.050	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L	33	20			26	20
Dissolved Chloride (Cl-)	mg/L	5.5	1.0	5.7	1.0	5.3	1.0
Colour	TCU	50 (1)	10	43	5.0	52 (1)	25
Dissolved Fluoride (F-)	mg/L	ND	0.10			ND	0.10
Nitrate + Nitrite (N)	mg/L	ND	0.050	0.050	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	0.058	0.050
Dissolved Organic Carbon (C)	mg/L			5.6	0.5		
Total Organic Carbon (C)	mg/L	7.4	0.50	5.8	0.50	8.0	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010	ND	0.010
pH	pH	6.20	N/A	6.08	N/A	6.09	N/A
Salinity	N/A	ND	2.0			ND	2.0
Reactive Silica (SiO2)	mg/L	1.6	0.50	1.6	0.50	1.7	0.50
Total Suspended Solids	mg/L	15	2.5			13	2.0
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	7.3	0.10	0.28	0.10	4.2	0.10
Conductivity	uS/cm	24	1.0	25	1.0	27	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSU398		HSU399		HSU400		HSU401	
Sampling Date		2018/09/12 09:40		2018/09/12 11:00		2018/09/12 11:00		2018/09/12 11:25	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW14	RDL	SW14 FILTERED	RDL	SW7	RDL

Calculated Parameters									
Anion Sum	me/L	0.130	N/A	0.150	N/A	0.140	N/A	0.170	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	11	1.0	12	1.0	11	1.0	16	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.220	N/A	0.230	N/A	0.220	N/A	0.270	N/A
Hardness (CaCO3)	mg/L	3.2	1.0	3.3	1.0	3.5	1.0	5.8	1.0
Ion Balance (% Difference)	%	25.7	N/A	21.1	N/A	22.2	N/A	22.7	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	0.056	0.050	ND	0.050	0.11	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L			14	5.0			27	20
Dissolved Chloride (Cl-)	mg/L	4.7	1.0	5.0	1.0	4.9	1.0	5.9	1.0
Colour	TCU	45 (1)	10	27	5.0	25	5.0	31	5.0
Dissolved Fluoride (F-)	mg/L			ND	0.10			ND	0.10
Nitrate + Nitrite (N)	mg/L	ND	0.050	0.056	0.050	ND	0.050	0.11	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Dissolved Organic Carbon (C)	mg/L	6.2	0.5			4.8	0.5		
Total Organic Carbon (C)	mg/L	6.4	0.50	5.1	0.50	5.0	0.50	7.1	0.50
Orthophosphate (P)	mg/L	ND	0.010	0.011	0.010	0.010	0.010	ND	0.010
pH	pH	5.93	N/A	6.11	N/A	6.21	N/A	6.01	N/A
Salinity	N/A			ND	2.0			ND	2.0
Reactive Silica (SiO2)	mg/L	1.7	0.50	1.6	0.50	1.6	0.50	3.7	0.50
Total Suspended Solids	mg/L			4.8	2.0			ND	2.0
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	0.14	0.10	1.3	0.10	0.13	0.10	1.7	0.10
Conductivity	uS/cm	26	1.0	27	1.0	25	1.0	31	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

Maxxam Analytics - Environmental Water Testing

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSU402		HSU403		HSU404		HSU405	
Sampling Date		2018/09/12 11:25		2018/09/12 12:20		2018/09/12 12:20		2018/09/12 12:50	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW7 FILTERED	RDL	SW1	RDL	SW1 FILTERED	RDL	SW2	RDL

Calculated Parameters

Anion Sum	me/L	0.140	N/A	0.140	N/A	0.140	N/A	0.110	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	14	1.0	18	1.0	18	1.0	8.0	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.260	N/A	0.260	N/A	0.250	N/A	0.170	N/A
Hardness (CaCO3)	mg/L	5.9	1.0	5.0	1.0	5.1	1.0	2.6	1.0
Ion Balance (% Difference)	%	30.0	N/A	30.0	N/A	28.2	N/A	21.4	N/A
Langelier Index (@ 20C)	N/A	NC		NC		NC		NC	
Langelier Index (@ 4C)	N/A	NC		NC		NC		NC	
Nitrate (N)	mg/L	ND	0.050	0.11	0.050	0.096	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC		NC		NC		NC	
Saturation pH (@ 4C)	N/A	NC		NC		NC		NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	ND	5.0	ND	5.0	ND	5.0	ND	5.0
Total Chemical Oxygen Demand	mg/L			34	20			12	5.0
Dissolved Chloride (Cl-)	mg/L	5.0	1.0	4.8	1.0	4.8	1.0	4.0	1.0
Colour	TCU	34	5.0	87 (1)	25	81 (1)	25	17	5.0
Dissolved Fluoride (F-)	mg/L			ND	0.10			ND	0.10
Nitrate + Nitrite (N)	mg/L	ND	0.050	0.11	0.050	0.11	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	0.010	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Dissolved Organic Carbon (C)	mg/L	7.1	0.5			13	0.5		
Total Organic Carbon (C)	mg/L	7.1	0.50	13	0.50	12	0.50	4.2	0.50
Orthophosphate (P)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
pH	pH	5.85	N/A	5.88	N/A	5.74	N/A	6.41	N/A
Salinity	N/A			ND	2.0			ND	2.0
Reactive Silica (SiO2)	mg/L	3.6	0.50	7.4	0.50	7.4	0.50	0.59	0.50
Total Suspended Solids	mg/L			ND	1.0			2.0	1.0
Dissolved Sulphate (SO4)	mg/L	ND	2.0	ND	2.0	ND	2.0	ND	2.0
Turbidity	NTU	0.75	0.10	1.1	0.10	0.26	0.10	1.3	0.10
Conductivity	uS/cm	32	1.0	28	1.0	29	1.0	20	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

(1) Elevated reporting limit due to sample matrix.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSU406		HSU407		HSU408		HSU409	
Sampling Date		2018/09/12 12:50		2018/09/12 13:20		2018/09/12 13:40		2018/09/12 13:50	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW2 FILTERED	RDL	SW4	RDL	FILTER BLANK	RDL	FIELD BLANK	RDL

Calculated Parameters

Anion Sum	me/L	0.220	N/A	0.510	N/A	0.00	N/A	0.00	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5.0	1.0	15	1.0	ND	1.0	ND	1.0
Calculated TDS	mg/L	11	1.0	35	1.0	ND	1.0	ND	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Cation Sum	me/L	0.170	N/A	0.510	N/A	0.0100	N/A	0.0100	N/A
Hardness (CaCO3)	mg/L	2.5	1.0	16	1.0	ND	1.0	ND	1.0
Ion Balance (% Difference)	%	12.8	N/A	0.00	N/A	100	N/A	100	N/A
Langelier Index (@ 20C)	N/A	-4.95		-2.59		NC		NC	
Langelier Index (@ 4C)	N/A	-5.20		-2.84		NC		NC	
Nitrate (N)	mg/L	0.053	0.050	0.097	0.050	0.057	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	10.9		9.38		NC		NC	
Saturation pH (@ 4C)	N/A	11.1		9.63		NC		NC	

Inorganics

Total Alkalinity (Total as CaCO3)	mg/L	5.0	5.0	15	5.0	ND	5.0	ND	5.0
Dissolved Chloride (Cl-)	mg/L	4.1	1.0	3.9	1.0	ND	1.0	ND	1.0
Colour	TCU	15	5.0	37	5.0	ND	5.0	ND	5.0
Nitrate + Nitrite (N)	mg/L	0.053	0.050	0.097	0.050	0.057	0.050	ND	0.050
Nitrite (N)	mg/L	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.050	0.18	0.050	ND	0.050	0.071	0.050
Dissolved Organic Carbon (C)	mg/L	4.1	0.5			ND	0.5		
Total Organic Carbon (C)	mg/L	4.0	0.50	6.0	0.50	ND	0.50	ND	0.50
Orthophosphate (P)	mg/L	ND	0.010	0.018	0.010	ND	0.010	ND	0.010
pH	pH	5.93	N/A	6.79	N/A	6.51	N/A	6.07	N/A
Salinity	N/A							ND	2.0
Reactive Silica (SiO2)	mg/L	0.56	0.50	5.9	0.50	ND	0.50	ND	0.50
Total Suspended Solids	mg/L							ND	1.0
Dissolved Sulphate (SO4)	mg/L	ND	2.0	4.2	2.0	ND	2.0	ND	2.0
Turbidity	NTU	0.19	0.10	0.38	0.10	0.25	0.10	0.15	0.10
Conductivity	uS/cm	21	1.0	53	1.0	2.4	1.0	1.5	1.0

RDL = Reportable Detection Limit

N/A = Not Applicable

ND = Not detected

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HSU395		HSU396		HSU397		HSU398	
Sampling Date		2018/09/12 09:00		2018/09/12 09:00		2018/09/12 09:40		2018/09/12 09:40	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 DEPTH	RDL	SW13 DEPTH FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	0.015	0.013			0.015	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam ID		HSU399		HSU400		HSU401		HSU402	
Sampling Date		2018/09/12 11:00		2018/09/12 11:00		2018/09/12 11:25		2018/09/12 11:25	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW14	RDL	SW14 FILTERED	RDL	SW7	RDL	SW7 FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam ID		HSU403		HSU404		HSU405		HSU406	
Sampling Date		2018/09/12 12:20		2018/09/12 12:20		2018/09/12 12:50		2018/09/12 12:50	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW1	RDL	SW1 FILTERED	RDL	SW2	RDL	SW2 FILTERED	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			ND	0.013			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013			ND	0.013		
RDL = Reportable Detection Limit ND = Not detected									

Maxxam Analytics International Corporation - Bedford, Nova Scotia

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		HSU408		HSU409	
Sampling Date		2018/09/12 13:40		2018/09/12 13:50	
COC Number		C#681838-05-01		C#681838-05-01	
	UNITS	FILTER BLANK	RDL	FIELD BLANK	RDL
Metals					
Dissolved Mercury (Hg)	ug/L	ND	0.013		
Total Mercury (Hg)	ug/L			ND	0.013
RDL = Reportable Detection Limit ND = Not detected					

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ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU395		HSU396		HSU397	
Sampling Date		2018/09/12 09:00		2018/09/12 09:00		2018/09/12 09:40	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 DEPTH	RDL
Metals							
Dissolved Aluminum (Al)	ug/L			87	5.0		
Total Aluminum (Al)	ug/L	290	5.0			280	5.0
Dissolved Antimony (Sb)	ug/L			ND	1.0		
Total Antimony (Sb)	ug/L	ND	1.0			ND	1.0
Dissolved Arsenic (As)	ug/L			7.4	1.0		
Total Arsenic (As)	ug/L	21	1.0			22	1.0
Dissolved Barium (Ba)	ug/L			2.9	1.0		
Total Barium (Ba)	ug/L	3.6	1.0			3.5	1.0
Dissolved Beryllium (Be)	ug/L			ND	1.0		
Total Beryllium (Be)	ug/L	ND	1.0			ND	1.0
Dissolved Bismuth (Bi)	ug/L			ND	2.0		
Total Bismuth (Bi)	ug/L	ND	2.0			ND	2.0
Dissolved Boron (B)	ug/L			ND	50		
Total Boron (B)	ug/L	ND	50			ND	50
Dissolved Cadmium (Cd)	ug/L			0.012	0.010		
Total Cadmium (Cd)	ug/L	ND	0.010			ND	0.010
Dissolved Calcium (Ca)	ug/L			720	100		
Total Calcium (Ca)	ug/L	690	100			700	100
Dissolved Chromium (Cr)	ug/L			ND	1.0		
Total Chromium (Cr)	ug/L	ND	1.0			ND	1.0
Dissolved Cobalt (Co)	ug/L			ND	0.40		
Total Cobalt (Co)	ug/L	ND	0.40			ND	0.40
Dissolved Copper (Cu)	ug/L			ND	2.0		
Total Copper (Cu)	ug/L	ND	2.0			ND	2.0
Dissolved Iron (Fe)	ug/L			310	50		
Total Iron (Fe)	ug/L	1400	50			1500	50
Dissolved Lead (Pb)	ug/L			ND	0.50		
Total Lead (Pb)	ug/L	0.72	0.50			0.75	0.50
Dissolved Magnesium (Mg)	ug/L			340	100		
Total Magnesium (Mg)	ug/L	360	100			370	100
Dissolved Manganese (Mn)	ug/L			54	2.0		
Total Manganese (Mn)	ug/L	62	2.0			65	2.0
Dissolved Molybdenum (Mo)	ug/L			ND	2.0		
Total Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0
RDL = Reportable Detection Limit ND = Not detected							

Maxxam Analytics - Environmental Data Reporting

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU395		HSU396		HSU397	
Sampling Date		2018/09/12 09:00		2018/09/12 09:00		2018/09/12 09:40	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 DEPTH	RDL
Dissolved Nickel (Ni)	ug/L			ND	2.0		
Total Nickel (Ni)	ug/L	ND	2.0			ND	2.0
Dissolved Phosphorus (P)	ug/L			ND	100		
Total Phosphorus (P)	ug/L	110	100			110	100
Dissolved Potassium (K)	ug/L			240	100		
Total Potassium (K)	ug/L	280	100			290	100
Dissolved Selenium (Se)	ug/L			ND	1.0		
Total Selenium (Se)	ug/L	ND	1.0			ND	1.0
Dissolved Silver (Ag)	ug/L			ND	0.10		
Total Silver (Ag)	ug/L	ND	0.10			ND	0.10
Dissolved Sodium (Na)	ug/L			3100	100		
Total Sodium (Na)	ug/L	3100	100			3400	100
Dissolved Strontium (Sr)	ug/L			5.4	2.0		
Total Strontium (Sr)	ug/L	6.0	2.0			6.1	2.0
Dissolved Thallium (Tl)	ug/L			ND	0.10		
Total Thallium (Tl)	ug/L	ND	0.10			ND	0.10
Dissolved Tin (Sn)	ug/L			ND	2.0		
Total Tin (Sn)	ug/L	ND	2.0			ND	2.0
Dissolved Titanium (Ti)	ug/L			ND	2.0		
Total Titanium (Ti)	ug/L	9.8	2.0			12	2.0
Dissolved Uranium (U)	ug/L			ND	0.10		
Total Uranium (U)	ug/L	ND	0.10			ND	0.10
Dissolved Vanadium (V)	ug/L			ND	2.0		
Total Vanadium (V)	ug/L	ND	2.0			ND	2.0
Dissolved Zinc (Zn)	ug/L			ND	5.0		
Total Zinc (Zn)	ug/L	ND	5.0			ND	5.0
RDL = Reportable Detection Limit ND = Not detected							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU398		HSU399		HSU400		HSU401	
Sampling Date		2018/09/12 09:40		2018/09/12 11:00		2018/09/12 11:00		2018/09/12 11:25	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW14	RDL	SW14 FILTERED	RDL	SW7	RDL

Metals									
Dissolved Aluminum (Al)	ug/L	92	5.0			62	5.0		
Total Aluminum (Al)	ug/L			100	5.0			120	5.0
Dissolved Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Total Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Dissolved Arsenic (As)	ug/L	7.0	1.0			23	1.0		
Total Arsenic (As)	ug/L			33	1.0			2.5	1.0
Dissolved Barium (Ba)	ug/L	2.9	1.0			3.0	1.0		
Total Barium (Ba)	ug/L			3.2	1.0			4.0	1.0
Dissolved Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Total Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Dissolved Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Total Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Dissolved Boron (B)	ug/L	ND	50			ND	50		
Total Boron (B)	ug/L			ND	50			ND	50
Dissolved Cadmium (Cd)	ug/L	0.011	0.010			0.010	0.010		
Total Cadmium (Cd)	ug/L			ND	0.010			0.011	0.010
Dissolved Calcium (Ca)	ug/L	740	100			790	100		
Total Calcium (Ca)	ug/L			700	100			1300	100
Dissolved Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Total Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Dissolved Cobalt (Co)	ug/L	ND	0.40			ND	0.40		
Total Cobalt (Co)	ug/L			ND	0.40			0.67	0.40
Dissolved Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Total Copper (Cu)	ug/L			ND	2.0			ND	2.0
Dissolved Iron (Fe)	ug/L	360	50			170	50		
Total Iron (Fe)	ug/L			490	50			360	50
Dissolved Lead (Pb)	ug/L	ND	0.50			ND	0.50		
Total Lead (Pb)	ug/L			ND	0.50			ND	0.50
Dissolved Magnesium (Mg)	ug/L	340	100			380	100		
Total Magnesium (Mg)	ug/L			390	100			600	100
Dissolved Manganese (Mn)	ug/L	55	2.0			52	2.0		
Total Manganese (Mn)	ug/L			95	2.0			520	2.0
Dissolved Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		
Total Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0

RDL = Reportable Detection Limit
ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU398		HSU399		HSU400		HSU401	
Sampling Date		2018/09/12 09:40		2018/09/12 11:00		2018/09/12 11:00		2018/09/12 11:25	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW14	RDL	SW14 FILTERED	RDL	SW7	RDL
Dissolved Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Total Nickel (Ni)	ug/L			ND	2.0			ND	2.0
Dissolved Phosphorus (P)	ug/L	ND	100			ND	100		
Total Phosphorus (P)	ug/L			ND	100			ND	100
Dissolved Potassium (K)	ug/L	240	100			310	100		
Total Potassium (K)	ug/L			330	100			ND	100
Dissolved Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Total Selenium (Se)	ug/L			ND	1.0			ND	1.0
Dissolved Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Total Silver (Ag)	ug/L			ND	0.10			ND	0.10
Dissolved Sodium (Na)	ug/L	3100	100			3100	100		
Total Sodium (Na)	ug/L			3100	100			3300	100
Dissolved Strontium (Sr)	ug/L	5.1	2.0			6.4	2.0		
Total Strontium (Sr)	ug/L			5.9	2.0			7.0	2.0
Dissolved Thallium (Tl)	ug/L	ND	0.10			ND	0.10		
Total Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Dissolved Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Total Tin (Sn)	ug/L			ND	2.0			ND	2.0
Dissolved Titanium (Ti)	ug/L	2.1	2.0			ND	2.0		
Total Titanium (Ti)	ug/L			ND	2.0			ND	2.0
Dissolved Uranium (U)	ug/L	ND	0.10			ND	0.10		
Total Uranium (U)	ug/L			ND	0.10			ND	0.10
Dissolved Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Total Vanadium (V)	ug/L			ND	2.0			ND	2.0
Dissolved Zinc (Zn)	ug/L	5.3	5.0			12	5.0		
Total Zinc (Zn)	ug/L			ND	5.0			ND	5.0

RDL = Reportable Detection Limit
ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU402		HSU403		HSU404		HSU405	
Sampling Date		2018/09/12 11:25		2018/09/12 12:20		2018/09/12 12:20		2018/09/12 12:50	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW7 FILTERED	RDL	SW1	RDL	SW1 FILTERED	RDL	SW2	RDL
Metals									
Dissolved Aluminum (Al)	ug/L	93	5.0			220	5.0		
Total Aluminum (Al)	ug/L			230	5.0			69	5.0
Dissolved Antimony (Sb)	ug/L	ND	1.0			ND	1.0		
Total Antimony (Sb)	ug/L			ND	1.0			ND	1.0
Dissolved Arsenic (As)	ug/L	1.8	1.0			2.8	1.0		
Total Arsenic (As)	ug/L			2.8	1.0			ND	1.0
Dissolved Barium (Ba)	ug/L	3.7	1.0			5.5	1.0		
Total Barium (Ba)	ug/L			5.6	1.0			2.8	1.0
Dissolved Beryllium (Be)	ug/L	ND	1.0			ND	1.0		
Total Beryllium (Be)	ug/L			ND	1.0			ND	1.0
Dissolved Bismuth (Bi)	ug/L	ND	2.0			ND	2.0		
Total Bismuth (Bi)	ug/L			ND	2.0			ND	2.0
Dissolved Boron (B)	ug/L	ND	50			ND	50		
Total Boron (B)	ug/L			ND	50			ND	50
Dissolved Cadmium (Cd)	ug/L	0.012	0.010			0.030	0.010		
Total Cadmium (Cd)	ug/L			0.020	0.010			0.011	0.010
Dissolved Calcium (Ca)	ug/L	1400	100			1200	100		
Total Calcium (Ca)	ug/L			1200	100			490	100
Dissolved Chromium (Cr)	ug/L	ND	1.0			ND	1.0		
Total Chromium (Cr)	ug/L			ND	1.0			ND	1.0
Dissolved Cobalt (Co)	ug/L	0.57	0.40			0.45	0.40		
Total Cobalt (Co)	ug/L			0.44	0.40			ND	0.40
Dissolved Copper (Cu)	ug/L	ND	2.0			ND	2.0		
Total Copper (Cu)	ug/L			ND	2.0			ND	2.0
Dissolved Iron (Fe)	ug/L	200	50			290	50		
Total Iron (Fe)	ug/L			300	50			97	50
Dissolved Lead (Pb)	ug/L	ND	0.50			ND	0.50		
Total Lead (Pb)	ug/L			ND	0.50			ND	0.50
Dissolved Magnesium (Mg)	ug/L	580	100			500	100		
Total Magnesium (Mg)	ug/L			510	100			320	100
Dissolved Manganese (Mn)	ug/L	470	2.0			120	2.0		
Total Manganese (Mn)	ug/L			110	2.0			24	2.0
Dissolved Molybdenum (Mo)	ug/L	ND	2.0			ND	2.0		
Total Molybdenum (Mo)	ug/L			ND	2.0			ND	2.0
RDL = Reportable Detection Limit ND = Not detected									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU402		HSU403		HSU404		HSU405	
Sampling Date		2018/09/12 11:25		2018/09/12 12:20		2018/09/12 12:20		2018/09/12 12:50	
COC Number		C#681838-05-01		C#681838-05-01		C#681838-05-01		C#681838-05-01	
	UNITS	SW7 FILTERED	RDL	SW1	RDL	SW1 FILTERED	RDL	SW2	RDL
Dissolved Nickel (Ni)	ug/L	ND	2.0			ND	2.0		
Total Nickel (Ni)	ug/L			ND	2.0			ND	2.0
Dissolved Phosphorus (P)	ug/L	ND	100			ND	100		
Total Phosphorus (P)	ug/L			ND	100			ND	100
Dissolved Potassium (K)	ug/L	ND	100			360	100		
Total Potassium (K)	ug/L			340	100			240	100
Dissolved Selenium (Se)	ug/L	ND	1.0			ND	1.0		
Total Selenium (Se)	ug/L			ND	1.0			ND	1.0
Dissolved Silver (Ag)	ug/L	ND	0.10			ND	0.10		
Total Silver (Ag)	ug/L			ND	0.10			ND	0.10
Dissolved Sodium (Na)	ug/L	3100	100			3000	100		
Total Sodium (Na)	ug/L			3100	100			2400	100
Dissolved Strontium (Sr)	ug/L	7.5	2.0			11	2.0		
Total Strontium (Sr)	ug/L			11	2.0			5.0	2.0
Dissolved Thallium (Tl)	ug/L	ND	0.10			ND	0.10		
Total Thallium (Tl)	ug/L			ND	0.10			ND	0.10
Dissolved Tin (Sn)	ug/L	ND	2.0			ND	2.0		
Total Tin (Sn)	ug/L			ND	2.0			ND	2.0
Dissolved Titanium (Ti)	ug/L	ND	2.0			2.7	2.0		
Total Titanium (Ti)	ug/L			3.8	2.0			ND	2.0
Dissolved Uranium (U)	ug/L	ND	0.10			ND	0.10		
Total Uranium (U)	ug/L			ND	0.10			ND	0.10
Dissolved Vanadium (V)	ug/L	ND	2.0			ND	2.0		
Total Vanadium (V)	ug/L			ND	2.0			ND	2.0
Dissolved Zinc (Zn)	ug/L	ND	5.0			15	5.0		
Total Zinc (Zn)	ug/L			ND	5.0			ND	5.0

RDL = Reportable Detection Limit
ND = Not detected

Maxxam Analytics International Corporation

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU406	HSU407	HSU408		HSU409	
Sampling Date		2018/09/12 12:50	2018/09/12 13:20	2018/09/12 13:40		2018/09/12 13:50	
COC Number		C#681838-05-01	C#681838-05-01	C#681838-05-01		C#681838-05-01	
	UNITS	SW2 FILTERED	SW4	FILTER BLANK	RDL	FIELD BLANK	RDL
Metals							
Dissolved Aluminum (Al)	ug/L	45	60	ND	5.0		
Total Aluminum (Al)	ug/L					ND	5.0
Dissolved Antimony (Sb)	ug/L	ND	ND	ND	1.0		
Total Antimony (Sb)	ug/L					ND	1.0
Dissolved Arsenic (As)	ug/L	ND	79	ND	1.0		
Total Arsenic (As)	ug/L					ND	1.0
Dissolved Barium (Ba)	ug/L	2.8	5.7	ND	1.0		
Total Barium (Ba)	ug/L					ND	1.0
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	1.0		
Total Beryllium (Be)	ug/L					ND	1.0
Dissolved Bismuth (Bi)	ug/L	ND	ND	ND	2.0		
Total Bismuth (Bi)	ug/L					ND	2.0
Dissolved Boron (B)	ug/L	ND	ND	ND	50		
Total Boron (B)	ug/L					ND	50
Dissolved Cadmium (Cd)	ug/L	0.015	0.020	ND	0.010		
Total Cadmium (Cd)	ug/L					ND	0.010
Dissolved Calcium (Ca)	ug/L	490	5400	ND	100		
Total Calcium (Ca)	ug/L					ND	100
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	1.0		
Total Chromium (Cr)	ug/L					ND	1.0
Dissolved Cobalt (Co)	ug/L	ND	1.4	ND	0.40		
Total Cobalt (Co)	ug/L					ND	0.40
Dissolved Copper (Cu)	ug/L	ND	ND	ND	2.0		
Total Copper (Cu)	ug/L					ND	2.0
Dissolved Iron (Fe)	ug/L	ND	710	ND	50		
Total Iron (Fe)	ug/L					ND	50
Dissolved Lead (Pb)	ug/L	ND	ND	ND	0.50		
Total Lead (Pb)	ug/L					ND	0.50
Dissolved Magnesium (Mg)	ug/L	320	660	ND	100		
Total Magnesium (Mg)	ug/L					ND	100
Dissolved Manganese (Mn)	ug/L	21	550	ND	2.0		
Total Manganese (Mn)	ug/L					ND	2.0
Dissolved Molybdenum (Mo)	ug/L	ND	ND	ND	2.0		
Total Molybdenum (Mo)	ug/L					ND	2.0
RDL = Reportable Detection Limit ND = Not detected							

Maxxam Analytics International Corporation - Bedford, Nova Scotia

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		HSU406	HSU407	HSU408		HSU409	
Sampling Date		2018/09/12 12:50	2018/09/12 13:20	2018/09/12 13:40		2018/09/12 13:50	
COC Number		C#681838-05-01	C#681838-05-01	C#681838-05-01		C#681838-05-01	
	UNITS	SW2 FILTERED	SW4	FILTER BLANK	RDL	FIELD BLANK	RDL
Dissolved Nickel (Ni)	ug/L	ND	ND	ND	2.0		
Total Nickel (Ni)	ug/L					ND	2.0
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	100		
Total Phosphorus (P)	ug/L					ND	100
Dissolved Potassium (K)	ug/L	250	620	ND	100		
Total Potassium (K)	ug/L					ND	100
Dissolved Selenium (Se)	ug/L	ND	ND	ND	1.0		
Total Selenium (Se)	ug/L					ND	1.0
Dissolved Silver (Ag)	ug/L	ND	ND	ND	0.10		
Total Silver (Ag)	ug/L					ND	0.10
Dissolved Sodium (Na)	ug/L	2500	3100	180	100		
Total Sodium (Na)	ug/L					120	100
Dissolved Strontium (Sr)	ug/L	5.4	18	ND	2.0		
Total Strontium (Sr)	ug/L					ND	2.0
Dissolved Thallium (Tl)	ug/L	ND	ND	ND	0.10		
Total Thallium (Tl)	ug/L					ND	0.10
Dissolved Tin (Sn)	ug/L	ND	ND	2.7	2.0		
Total Tin (Sn)	ug/L					ND	2.0
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	2.0		
Total Titanium (Ti)	ug/L					ND	2.0
Dissolved Uranium (U)	ug/L	ND	ND	ND	0.10		
Total Uranium (U)	ug/L					ND	0.10
Dissolved Vanadium (V)	ug/L	ND	ND	ND	2.0		
Total Vanadium (V)	ug/L					ND	2.0
Dissolved Zinc (Zn)	ug/L	ND	7.3	ND	5.0		
Total Zinc (Zn)	ug/L					ND	5.0
RDL = Reportable Detection Limit ND = Not detected							

Maxxam Analytics International Corporation - Bedford, Nova Scotia

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.7°C
Package 2	10.0°C
Package 3	10.3°C
Package 4	10.3°C

Sample HSU395 [SW13 SURFACE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU396 [SW13 SURFACE FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU397 [SW13 DEPTH] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU398 [SW13 DEPTH FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU399 [SW14] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU400 [SW14 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU401 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU402 [SW7 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU403 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU404 [SW1 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU405 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU406 [SW2 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU408 [FILTER BLANK] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU409 [FIELD BLANK] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Eric Dearman, Scientific Specialist



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation - Bedford, Nova Scotia Canada B4B 1G9

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCullum Environmental	Customer #:	B83573	Maxxam Job #:	B8N 8200		Bottle Order #:
Account Name: Accounts Payable	Contact Name: Ryan Gardner/ Jim Millard	B.I.T. #:		Client Of Company Location:			Project Manager:
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project #:	Fifteen Mile Stream	Client Of Company:			
City: Miramichi, New Brunswick NS B0N 1X0	City: Bedford NS B4B 1G7	Project Name:		Client Of Company:			
Phone: (502) 384-2772 Fax: (502) 384-2772	Phone: (502) 860-6375 Fax:	Project #:		Client Of Company:			
Website: www.maxxam.ca	Website: www.mccullumenvironmental.com	Project #:		Client Of Company:			

Regulation/Code:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)	Turnaround Time (TAT) Required:
** Specify Matrix: Surface/Ground Tapwater/Sewage/Effluent/Sewerage Possible Non-potable/Treated/Sol/Subject/Metal		<input type="checkbox"/> Adamic-RCAP-MS Total Metals in Water <input type="checkbox"/> AL (Li)-MS Dissolved (Field/Fill) in W <input type="checkbox"/> Mercury - Total (CVAALL) <input type="checkbox"/> Mercury - Dissolved (CVAALL) <input type="checkbox"/> Organic carbon - Diss (DOC) (as rec'd) <input type="checkbox"/> Methylmercury Water (Sub from Bed/fill) <input type="checkbox"/> Fluoride <input type="checkbox"/> Chemical Oxygen Demand (COD) <input type="checkbox"/> Chlor - (nyl) A (Sub from Bed/fill) <input type="checkbox"/> Salinity - Total Suspended Solids	Regular (Standard) TAT: (will be applied if Rush TAT is not specified) Standard TAT = 7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dissolved Phosphorus are + 5 days - contact your Project Manager for details. Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required:

Sample Bottle Label	Sample Location/Identification	Date Sampled	Time Sampled	Matrix	Field / Stored & Preserved Lab / Condition Required	Adamic-RCAP-MS Total Metals in Water	AL (Li)-MS Dissolved (Field/Fill) in W	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as rec'd)	Methylmercury Water (Sub from Bed/fill)	Fluoride	Chemical Oxygen Demand (COD)	Chlor - (nyl) A (Sub from Bed/fill)	Salinity - Total Suspended Solids	# of Bottles
1	SW13 surface	18/09/12	9:00	H ₂ O	/	/	/	/	/	/	/	/	/	/	/	/
2	SW13 Depth	"	9:40	H ₂ O	/	/	/	/	/	/	/	/	/	/	/	/
3	SW14	"	11:00	"	/	/	/	/	/	/	/	/	/	/	/	/
4	SW7	"	11:25	"	/	/	/	/	/	/	/	/	/	/	/	/
5	SW1	"	12:20	"	/	/	/	/	/	/	/	/	/	/	/	/
6	SW2	"	12:50	"	/	/	/	/	/	/	/	/	/	/	/	/
7	SW4	"	13:20	"	/	/	/	/	/	/	/	/	/	/	/	/
8	Filter Blank	"	13:40	"	/	/	/	/	/	/	/	/	/	/	/	/
9	Field Blank	"	13:50	"	/	/	/	/	/	/	/	/	/	/	/	/
10																

Attempt to Cool:
 Yes
 No

RELINQUISHED BY: (Signature/Print): <i>[Signature]</i>	Date: (YYMMDD): 18/09/12	Time: 1825	RECEIVED BY: (Signature/Print): <i>[Signature]</i>	Date: (YYMMDD):	Time:	# jars used and not submitted:	Lab Use Only
							Time Sensitive: <input type="checkbox"/> Temperature (°C) on Receipt: 15.9, 5/4, 12.8 Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No While Maxxam: <input type="checkbox"/> Yes <input type="checkbox"/> No 12, 6, 13, 5, 13, 13

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-05-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/10/01
Report #: R5422812
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N8200

Received: 2018/09/12, 16:22

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Chlorophyll A (Sub from Bedford) (1)	6	2018/09/13	2018/09/19		

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Dalhousie Dept of Oceanography

Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: C#681838-05-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2018/10/01
Report #: R5422812
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

MAXXAM JOB #: B8N8200
Received: 2018/09/12, 16:22

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		HSU395	HSU397	HSU399	HSU401	HSU403	HSU405
Sampling Date		2018/09/12 09:00	2018/09/12 09:40	2018/09/12 11:00	2018/09/12 11:25	2018/09/12 12:20	2018/09/12 12:50
COC Number		C#681838-05-01	C#681838-05-01	C#681838-05-01	C#681838-05-01	C#681838-05-01	C#681838-05-01
	UNITS	SW13 SURFACE	SW13 DEPTH	SW14	SW7	SW1	SW2
Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED

Maxxam Analytics International Corporation - 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.7°C
Package 2	10.0°C
Package 3	10.3°C
Package 4	10.3°C

Sample HSU395 [SW13 SURFACE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU396 [SW13 SURFACE FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU397 [SW13 DEPTH] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU398 [SW13 DEPTH FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU399 [SW14] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU400 [SW14 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU401 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU402 [SW7 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU403 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU404 [SW1 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU405 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU406 [SW2 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU408 [FILTER BLANK] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample HSU409 [FIELD BLANK] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Eric Dearman, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation - Bedford, Nova Scotia Canada B4B 1G9



Dalhousie University

Department of Oceanography
Halifax, N.S.
B3H 4R2

Maxxam Analytics Inc., 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Re: Determination of chlorophyll a in algae by fluorescence

Maxxam Project#: B8N8200

Acidification Technique:

Sample ID	Client ID	Chl a ($\mu\text{g L}^{-1}$)
HSU395-02R	SW13 SURFACE	3.30
HSU397-02R	SW13 DEPTH	8.27
HSU399-02R	SW14	1.24
HSU401-02R	SW7	0.32
HSU403-02R	SW1	0.55
HSU405-02R	SW2	2.24

- **Chl a = chlorophyll a**

Received: September 14, 2018

Completed: September 19, 2018

Hugh MacIntyre Ph.D.

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCullum Environmental	Customer #: B83573	Maxxam Job #: B8N 8200	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #
Account Name: Accounts Payable	Contact Name: Ryan Gardiner/ Jim Millard	Project Name: Fifteen Mile Stream	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project Name: Fifteen Mile Stream	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #
Address: Mobile Mailbox/Bedford NS B0N 1X0	Address: Bedford NS B4B 1G7	Project Name: Fifteen Mile Stream	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #
Phone: (902) 384-2772	Phone: (902) 860-6375	Project Name: Fifteen Mile Stream	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #
Website: www.atlanticmining.com	Website: www.mccullumenvironmental.com	Project Name: Fifteen Mile Stream	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #	Maxxam Job #

Regulation/Source:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)												Turnaround Time (TAT) Required:	
Special Instructions:	Special Instructions:	Field / Stored & Preserved	Lab / Ambient Required	Asbestos - RCAP-MS Total Metals in Water	Asbestos - RCAP-MS Dissolved (Field/Fill) in W	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as req'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlor - (nyl) A (Sub from Bedford)	Salinity - Total Suspended Solids	# of Bottles	Comments (Remarks) - User Filled In Only

Sample Bottle Label	Sample Location/Identification	Date Sampled	Time Sampled	Matrix	Field / Stored & Preserved	Lab / Ambient Required	Asbestos - RCAP-MS Total Metals in Water	Asbestos - RCAP-MS Dissolved (Field/Fill) in W	Mercury - Total (CVAALL)	Mercury - Dissolved (CVAALL)	Organic carbon - Diss (DOC) (as req'd)	Methylmercury Water (Sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlor - (nyl) A (Sub from Bedford)	Salinity - Total Suspended Solids	# of Bottles	Comments (Remarks) - User Filled In Only	
1	SW13 surface	18/09/12	9:00	H ₂ O	/	/	/	/	/	/	/	/	/	/	/	/	/		
2	SW13 Depth	"	9:40	H ₂ O	/	/	/	/	/	/	/	/	/	/	/	/	/		
3	SW14	"	11:00	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
4	SW7	"	11:25	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
5	SW1	"	12:20	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
6	SW2	"	12:50	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
7	SW4	"	13:20	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
8	Filter Blank	"	13:40	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
9	Field Blank	"	13:50	"	/	/	/	/	/	/	/	/	/	/	/	/	/		
10																			

Attempt to Cool:
 Yes
 No

RELINQUISHED BY: (Signature/Print): <i>[Signature]</i>	Date: (YYMMDD): 18/09/12	Time: 1825	RECEIVED BY: (Signature/Print): <i>[Signature]</i>	Date: (YYMMDD):	Time:	# jars used and not submitted:	Lab Use Only
Time Sensitive: <input type="checkbox"/>	Temperature (°C) on Receipt: 15.9, 5/4, 12.8	Customs Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No	Time Sensitive: <input type="checkbox"/>	Temperature (°C) on Receipt: 12.6, 13.5, 13.13	Customs Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No	Time Sensitive: <input type="checkbox"/>	Temperature (°C) on Receipt: 12.6, 13.5, 13.13

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Attention: Maryann Comeau

Fax #:

MComeau@maxxam.ca; bclientsvcsbcontr@maxxam.ca

Project #: B8N8200

Methylmercury Analysis in Water

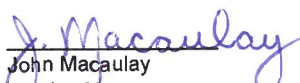
Analytes:				Methylmercury
Units:				µg/L
RL:				0.004
RPC Sample ID	Client Sample ID	Date Sampled	Matrix	
289255-1	HSU395-01R\SW13 SURFACE	12-Sep-18	water	< 0.004
289255-2	HSU397-01R\SW13 DEPTH	12-Sep-18	water	< 0.004
289255-3	HSU399-01R\SW14	12-Sep-18	water	< 0.004
289255-4	HSU401-01R\SW7	12-Sep-18	water	< 0.004
289255-5	HSU403-01R\SW1	12-Sep-18	water	< 0.004
289255-6	HSU405-01R\SW2	12-Sep-18	water	< 0.004
Method Blank 1	-	-	water	< 0.004
Method Blank 2	-	-	water	< 0.004
Spike 1 Rec. (%)	-	-	water	121
Spike 2 Rec. (%)	-	-	water	88

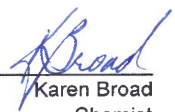
This report relates only to the sample(s) and information provided to the laboratory.

Method: Solvent extraction, derivatization, followed by GC/MS analysis.

RL = Reporting Limit

Methylmercury analysed as ethylated methylmercury.


John Macaulay
Section Manager
Organic Analytical Services


Karen Broad
Chemist
Organic Analytical Services

Report ID: 292511-OAS
Report Date: 18-Jan-19
Date Received: 11-Oct-18

Maxxam Analytics Inc.
200 Bluewater Road, Suite 105
Bedford, NS B4B 1G9

rpc

921 College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506-452-1212
Fax: 506-452-0594
www.rpc.ca

Attention: Maryann Comeau

Fax #:

MComeau@maxxam.ca; bclientsvcscontr@maxxam.ca

Project #: B8Q5948

Methylmercury Analysis in Water

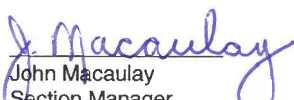
Analytes:				Methylmercury
Units:				µg/L
RL:				0.004
RPC Sample ID	Client Sample ID	Date Sampled	Matrix	
292511-1	HYY207-06RISW16	09-Oct-18	water	< 0.004
Method Blank	-	-	water	< 0.004
Spike Rec. (%)	-	-	water	108

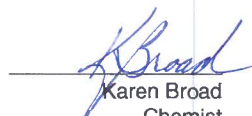
This report relates only to the sample(s) and information provided to the laboratory.

Method: Solvent extraction, derivatization, followed by GC/MS analysis.

RL = Reporting Limit

Methylmercury analysed as ethylated methylmercury.


John Macaulay
Section Manager
Organic Analytical Services


Karen Broad
Chemist
Organic Analytical Services

Methyl Mercury Results

Flett Research Ltd.

440 DeSabberry Ave. Winnipeg, MB R2L 0Y7
 Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR121818JS1
 Page 1 of 1

CLIENT: Maxxam Analytics - Bedford: B8W2926

200 Bluewater Road, Suite 105
 Bedford, NS B4B 1G9

Date Received: December 6, 2018
Sampling Date: December 3, 2018

Matrix: Water

Transaction ID: 870
PO/Contract No.:
Date Analysed: December 18, 2018
Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 1)

Comments: Sample SW 3 had particulates present, while all other samples were yellow in colour with particulates present.

Detection Limit: 0.08 ng/L (ML). MDL=0.03 ng/L (based on 7 replicates of method blanks with 98% confidence level and the analysis of 45mL of raw sample and 20mL of distillate).
 For reporting purpose samples will be flagged below the ML which is considered a practical detection limit.

Estimated Uncertainty: The estimated uncertainty of this method has preliminarily been determined to be ± 10 % at methyl mercury concentrations of 0.5 and 2.5 ng/L (95 % confidence). Uncertainty at 0.1 ng/L is 13% (95% confidence).

Results authorized by Dr. Robert J. Flett, Chief Scientist

Blanks		Pg of CH3Hg in the Ethylation Blank	Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L) <small>assumes volume is 30mL</small>					
Ethylation blank (H ₂ O+Reagents)		0.09	6.67	0.003					
Mean Eth. Blank (last 30 runs)		0.11							
Net Pg CH3Hg in the Method Blank <small>(Eth. Blank subtracted)</small>		Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) <small>[Eth. Blank subtracted]</small>						
Method Blank 1		0.09	13.41	0.00					
Method Blank 2		0.09	13.67	0.00					
Method Blank 3		0.05	10.52	0.00					
Mean Method Blank				0.00					
Mean Calibration Factor <small>(area units / pg)</small>		73.82 ± 5.1 %RSD							
Spike Recovery <small>Matrix Spike (MS) and Matrix Spike Duplicate (MSD)</small>		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)	
		ILL983-18R (SW 5)	MS1	2132.58	47.58	100%	1.12	91.9	
		ILL983-18R (SW 5)	MS1D	1897.64	47.19	100%	1.10	88.8	
		Mean of Spike Recoveries						90.4	
QC Samples <small>Ongoing Precision & Recovery (OPR)</small>		MeOPR ID1701 (1000ng/L)	<small>(beginning of run)</small>		862.61	0.050	100%	912	91.2
		MeOPR ID1701 (1000ng/L)	<small>(end of run)</small>		840.67	0.050	100%	941	94.1
		Mean of MeOPR					927	92.7	
<small>Alternate Source Standard (A.S.S.)</small>		A.S.S.-Alfa ID1302 (1000 ng/L)		3114.54		100%	1053	105.3	
LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) <small>[Ethylation & Method Blank subtracted] [recovery corrected]</small>
93324	ILL981-18R	SW 2	December 3, 2018	11:00		103.73	48.76	90.4%	~ 0.06
93325	ILL982-18R	SW 3	December 3, 2018	09:30		93.32	48.09	90.4%	~ 0.05
93326	ILL983-18R	SW 5	December 3, 2018	11:30		295.66	47.73	90.4%	0.17
93327	ILL984-18R	SW 10	December 3, 2018	12:15		94.58	48.87	90.4%	~ 0.05
93328	ILL985-18R	SW 11	December 3, 2018	10:15		202.08	47.78	90.4%	0.12
93329	ILL986-18R	SW 12	December 3, 2018	13:15		221.48	48.55	90.4%	0.14

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*: See 'Comments' section above for discussion.

This test report shall not be reproduced, except in full, without written approval of the laboratory.

- : Result below the official detection limit for this analyte in this matrix.

Note: Results relate only to the items tested.



Methyl Mercury Results

Flett Research Ltd.

440 DeSabberry Ave. Winnipeg, MB R2L 0Y7
 Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR121818JS2
 Page 1 of 1

CLIENT: Maxxam Analytics - Bedford: B8W4584

200 Bluewater Road, Suite 105
 Bedford, NS B4B 1G9

Date Received: December 7, 2018
Sampling Date: December 4, 2018

Matrix: Water

Transaction ID: 870
PO/Contract No.:
Date Analysed: December 18, 2018
Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 1)

Comments: Samples (except for FIELD/FILTER BLANK) were yellow in colour with particulates.

Detection Limit: 0.08 ng/L (ML). MDL=0.03 ng/L (based on 7 replicates of method blanks with 98% confidence level and the analysis of 45mL of raw sample and 20mL of distillate).
 For reporting purpose samples will be flagged below the ML which is considered a practical detection limit.

Estimated Uncertainty: The estimated uncertainty of this method has preliminarily been determined to be ± 10 % at methyl mercury concentrations of 0.5 and 2.5 ng/L (95 % confidence). Uncertainty at 0.1 ng/L is 13% (95% confidence).

Results authorized by Dr. Robert J. Flett, Chief Scientist

Blanks		Pg of CH3Hg in the Ethylation Blank	Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L) <small>assumes volume is 30mL</small>				
Ethylation blank (H ₂ O+Reagents)		0.09	6.67	0.003				
Mean Eth. Blank (last 30 runs)		0.11						
		Net Pg CH3Hg in the Method Blank <small>(Eth. Blank subtracted)</small>	Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) <small>[Eth. Blank subtracted]</small>				
Method Blank 1		0.09	13.41	0.00				
Method Blank 2		0.09	13.67	0.00				
Method Blank 3		0.05	10.52	0.00				
Mean Method Blank				0.00				
Mean Calibration Factor <small>(area units / pg)</small>		73.82 ± 5.1 %RSD						
Spike Recovery <small>Matrix Spike (MS) and Matrix Spike Duplicate (MSD)</small>		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)
		ILU723-12R (SW14)	MS2	1810.79	47.32	100%	1.08	95.9
		ILU723-12R (SW14)	MS2D	1701.03	47.11	100%	1.02	89.7
		Mean of Spike Recoveries						92.8
QC Samples <small>Ongoing Precision & Recovery (OPR)</small>		MeOPR ID1701 (1000ng/L)	(beginning of run)	862.61	0.050	100%	912	91.2
		MeOPR ID1701 (1000ng/L)	(end of run)	840.67	0.050	100%	941	94.1
		Mean of MeOPR					927	92.7
<small>Alternate Source Standard (A.S.S.)</small>		A.S.S.-Alfa ID1302 (1000 ng/L)		3114.54		100%	1053	105.3

%RPD=6.7

LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) <small>[Ethylation & Method Blank subtracted] [recovery corrected]</small>
93332	ILU713-12R	SW1	December 4, 2018	12:00		72.18	47.30	92.8%	~ 0.04
93333	ILU715-12R	SW4	December 4, 2018	13:45		263.29	48.68	92.8%	0.15
93334	ILU717-12R	SW7	December 4, 2018	09:30	DupA1	92.75	48.15	92.8%	~ 0.05
93334	ILU717-12R	SW7	December 4, 2018	09:30	DupA2	97.66	48.71	92.8%	~ 0.05
93335	ILU719-12R	SW8	December 4, 2018	10:30		106.06	48.31	92.8%	~ 0.06
93336	ILU721-12R	SW9	December 4, 2018	11:00		108.65	49.03	92.8%	~ 0.06
93337	ILU723-12R	SW14	December 4, 2018	09:00		132.62	47.59	92.8%	~ 0.07
93338	ILU725-12R	SW16	December 4, 2018	13:15		193.69	48.15	92.8%	0.12
93339	ILU727-12R	DUPLICATE	December 4, 2018	12:15		67.44	48.22	92.8%	~ 0.04
93340	ILU729-10R	FIELD/FILTER BLANK	December 4, 2018	12:30		13.32	47.78	92.8%	~ 0.00

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* : See 'Comments' section above for discussion.

This test report shall not be reproduced, except in full, without written approval of the laboratory.

Note: Results relate only to the items tested.

Dup : Duplicate - two subsamples of the same sample carried through the analytical procedure in an identical manner.



Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 694566-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/01/03
Report #: R5545794
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8W5998

Received: 2018/12/05, 15:43

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO ₃) in water (6)	3	N/A	2018/12/13		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	1	N/A	2018/12/07	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	1	N/A	2018/12/10	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	3	N/A	2018/12/12	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	1	N/A	2018/12/13	N/A	SM 23 4500-CO2 D
Alkalinity	2	N/A	2018/12/11	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	4	N/A	2018/12/12	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	2	N/A	2018/12/10	ATL SOP 00014	SM 23 4500-Cl- E m
Chloride	4	N/A	2018/12/12	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	3	N/A	2018/12/11	ATL SOP 00042	SM 23 5220D m
Colour	2	N/A	2018/12/10	ATL SOP 00020	SM 23 2120C m
Colour	4	N/A	2018/12/12	ATL SOP 00020	SM 23 2120C m
Organic carbon - Diss (DOC) (as rec'd) (7)	2	N/A	2018/12/16	ATL SOP 00203	SM 23 5310B m
Organic carbon - Diss (DOC) (as rec'd) (7)	1	N/A	2018/12/17	ATL SOP 00203	SM 23 5310B m
Conductance - water	2	N/A	2018/12/07	ATL SOP 00004	SM 23 2510B m
Conductance - water	3	N/A	2018/12/12	ATL SOP 00004	SM 23 2510B m
Conductance - water	1	N/A	2018/12/13	ATL SOP 00004	SM 23 2510B m
Fluoride	1	N/A	2018/12/07	ATL SOP 00043	SM 23 4500-F- C m
Fluoride	1	N/A	2018/12/12	ATL SOP 00043	SM 23 4500-F- C m
Fluoride	1	N/A	2018/12/13	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO ₃)	1	N/A	2018/12/10	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO ₃)	2	N/A	2018/12/11	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO ₃)	1	N/A	2018/12/12	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO ₃)	2	N/A	2018/12/13	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	3	2018/12/12	2018/12/13	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	3	2018/12/12	2018/12/13	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	3	N/A	2018/12/12	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	1	2018/12/07	2018/12/08	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	2	2018/12/10	2018/12/10	ATL SOP 00058	EPA 6020A R1 m
Dissolved Metals by ICPMS (1)	3	N/A	2018/12/10	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	3	N/A	2018/12/14	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	6	N/A	2018/12/14	N/A	Auto Calc.

Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 694566-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/01/03

Report #: R5545794

Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8W5998

Received: 2018/12/05, 15:43

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Anion and Cation Sum	6	N/A	2018/12/14	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	3	2018/12/10	2018/12/10	STL SOP-00035	MA300-CN 1.2 R3 m
Cyanide (Total) Low Level (3, 8)	3	2018/12/17	2018/12/18	CAL SOP-00073	EPA 335.4 R1 m
Nitrogen Ammonia - water	6	N/A	2018/12/13	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	2	N/A	2018/12/11	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrate + Nitrite	4	N/A	2018/12/13	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	2	N/A	2018/12/10	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrite	4	N/A	2018/12/12	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	2	N/A	2018/12/11	ATL SOP 00018	ASTM D3867-16
Nitrogen - Nitrate (as N)	4	N/A	2018/12/13	ATL SOP 00018	ASTM D3867-16
pH (9)	1	N/A	2018/12/07	ATL SOP 00003	SM 23 4500-H+ B m
pH (9)	1	N/A	2018/12/10	ATL SOP 00003	SM 23 4500-H+ B m
pH (9)	3	N/A	2018/12/12	ATL SOP 00003	SM 23 4500-H+ B m
pH (9)	1	N/A	2018/12/13	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	2	N/A	2018/12/10	ATL SOP 00021	SM 23 4500-P E m
Phosphorus - ortho	4	N/A	2018/12/12	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (4, 10)	3	N/A	2018/12/14	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (6)	3	N/A	2018/12/13		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	1	N/A	2018/12/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	5	N/A	2018/12/13	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2018/12/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	5	N/A	2018/12/13	ATL SOP 00049	Auto Calc.
Reactive Silica	2	N/A	2018/12/10	ATL SOP 00022	EPA 366.0 m
Reactive Silica	4	N/A	2018/12/12	ATL SOP 00022	EPA 366.0 m
Sulphate	2	N/A	2018/12/11	ATL SOP 00023	ASTM D516-16 m
Sulphate	4	N/A	2018/12/12	ATL SOP 00023	ASTM D516-16 m
Methyl Mercury (sub from Bedford) (5)	3	N/A	2018/12/18		EPA 1630
Total Dissolved Solids (Filt. Residue)	3	2018/12/12	2018/12/13	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	6	N/A	2018/12/14	N/A	Auto Calc.
Organic carbon - Total (TOC) (11)	3	N/A	2018/12/16	ATL SOP 00203	SM 23 5310B m

Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 694566-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/01/03
Report #: R5545794
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8W5998

Received: 2018/12/05, 15:43

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Organic carbon - Total (TOC) (11)	3	N/A	2018/12/17	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	3	2018/12/13	2018/12/14	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	3	2018/12/12	2018/12/17	ATL SOP 00007	SM 23 2540D m
Turbidity	1	N/A	2018/12/10	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	5	N/A	2018/12/13	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Maxxam Analytics Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Bedford to Calgary Offsite
- (4) This test was performed by Maxxam Analytics Kitimat
- (5) This test was performed by Sub Bedford to Flett Research
- (6) Non-accredited test method
- (7) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (8) *Note: Total cyanide values reported do not include contributions from thiocyanate.*

Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 694566-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/01/03
Report #: R5545794
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8W5998

Received: 2018/12/05, 15:43

(9) 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.

(10) Radium-226 results have not been corrected for blanks.

(11) 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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC331		IMC332		IMC332	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 SURFACE FILTERED Lab-Dup	RDL
Calculated Parameters							
Anion Sum	me/L	0.140	N/A	0.130	N/A		
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0		
Calculated TDS	mg/L	12	1.0	12	1.0		
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0		
Cation Sum	me/L	0.210	N/A	0.210	N/A		
Hardness (CaCO3)	mg/L	3.4	1.0	3.4	1.0		
Ion Balance (% Difference)	%	20.0	N/A	23.5	N/A		
Langelier Index (@ 20C)	N/A	NC		NC			
Langelier Index (@ 4C)	N/A	NC		NC			
Nitrate (N)	mg/L	<0.050	0.050	<0.050	0.050		
Saturation pH (@ 20C)	N/A	NC		NC			
Saturation pH (@ 4C)	N/A	NC		NC			
Inorganics							
Acidity	mg/L	5.2	5.0				
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	<5.0	5.0		
Total Chemical Oxygen Demand	mg/L	21	20				
Dissolved Chloride (Cl-)	mg/L	4.8	1.0	4.7	1.0		
Colour	TCU	76	25	77	25		
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.0020	0.0020				
Total Dissolved Solids	mg/L	10	10				
Dissolved Fluoride (F-)	mg/L	<0.10	0.10				
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	<0.050	0.050		
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	0.051	0.050		
Dissolved Organic Carbon (C)	mg/L			9.4	0.5	9.3	0.5
Total Organic Carbon (C)	mg/L	9.0	0.50	9.4	0.50		
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010		
pH	pH	5.46	N/A	5.73	N/A		
Total Phosphorus	mg/L	0.025	0.020				
Salinity	N/A	<2.0	2.0				
Reactive Silica (SiO2)	mg/L	3.0	0.50	3.1	0.50		
Total Suspended Solids	mg/L	<1.0	1.0				
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	<2.0	2.0		
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC331		IMC332		IMC332	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 SURFACE FILTERED Lab-Dup	RDL
Turbidity	NTU	0.66	0.10	0.13	0.10		
WAD Cyanide (Free)	mg/L	<0.0030	0.0030				
Conductivity	uS/cm	26	1.0	26	1.0		
RADIONUCLIDE							
Radium-226	Bq/L	<0.010	0.010				
Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	N/A				
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC333		IMC333		IMC334		IMC334	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 DEPTH	RDL	SW13 DEPTH Lab-Dup	RDL	SW13 DEPTH FILTERED	RDL	SW13 DEPTH FILTERED Lab-Dup	RDL
Calculated Parameters									
Anion Sum	me/L	0.160	N/A			0.130	N/A		
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0			<1.0	1.0		
Calculated TDS	mg/L	13	1.0			12	1.0		
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0			<1.0	1.0		
Cation Sum	me/L	0.220	N/A			0.210	N/A		
Hardness (CaCO3)	mg/L	3.4	1.0			3.4	1.0		
Ion Balance (% Difference)	%	15.8	N/A			23.5	N/A		
Langelier Index (@ 20C)	N/A	NC				NC			
Langelier Index (@ 4C)	N/A	NC				NC			
Nitrate (N)	mg/L	<0.050	0.050			<0.050	0.050		
Saturation pH (@ 20C)	N/A	NC				NC			
Saturation pH (@ 4C)	N/A	NC				NC			
Inorganics									
Acidity	mg/L	6.6	5.0						
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	<5.0	5.0	<5.0	5.0		
Total Chemical Oxygen Demand	mg/L	23	20						
Dissolved Chloride (Cl-)	mg/L	5.6	1.0	5.7	1.0	4.7	1.0		
Colour	TCU	82	25	83	25	78	25		
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.0020	0.0020						
Total Dissolved Solids	mg/L	14	10						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10						
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	<0.050	0.050	<0.050	0.050		
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050			<0.050	0.050		
Dissolved Organic Carbon (C)	mg/L					9.7	0.5		
Total Organic Carbon (C)	mg/L	9.4	0.50			9.3	0.50	9.6	0.50
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010		
pH	pH	5.27	N/A			5.59	N/A		
Total Phosphorus	mg/L	0.025	0.020						
Salinity	N/A	<2.0	2.0						
Reactive Silica (SiO2)	mg/L	3.1	0.50	3.1	0.50	3.0	0.50		
Total Suspended Solids	mg/L	<1.0	1.0						
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	<2.0	2.0	<2.0	2.0		
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC333		IMC333		IMC334		IMC334	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 DEPTH	RDL	SW13 DEPTH Lab-Dup	RDL	SW13 DEPTH FILTERED	RDL	SW13 DEPTH FILTERED Lab-Dup	RDL
Turbidity	NTU	0.47	0.10			0.63	0.10		
WAD Cyanide (Free)	mg/L	<0.0030	0.0030						
Conductivity	uS/cm	26	1.0			26	1.0		
RADIONUCLIDE									
Radium-226	Bq/L	<0.010	0.010						
Subcontracted Analysis									
Subcontract Parameter	N/A	ATTACHED	N/A						
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC335		IMC336		IMC336	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW6	RDL	SW6 FILTERED	RDL	SW6 FILTERED Lab-Dup	RDL
Calculated Parameters							
Anion Sum	me/L	0.140	N/A	0.160	N/A		
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0		
Calculated TDS	mg/L	12	1.0	13	1.0		
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0		
Cation Sum	me/L	0.200	N/A	0.210	N/A		
Hardness (CaCO3)	mg/L	3.3	1.0	3.4	1.0		
Ion Balance (% Difference)	%	17.7	N/A	13.5	N/A		
Langelier Index (@ 20C)	N/A	NC		NC			
Langelier Index (@ 4C)	N/A	NC		NC			
Nitrate (N)	mg/L	<0.050	0.050	<0.050	0.050		
Saturation pH (@ 20C)	N/A	NC		NC			
Saturation pH (@ 4C)	N/A	NC		NC			
Inorganics							
Acidity	mg/L	5.8	5.0				
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	<5.0	5.0	<5.0	5.0
Total Chemical Oxygen Demand	mg/L	21	20				
Dissolved Chloride (Cl-)	mg/L	4.9	1.0	5.7	1.0	5.5	1.0
Colour	TCU	81	25	83	25	78	25
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.0020	0.0020				
Total Dissolved Solids	mg/L	21	10				
Dissolved Fluoride (F-)	mg/L	<0.10	0.10				
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	<0.050	0.050	<0.050	0.050
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	<0.050	0.050		
Dissolved Organic Carbon (C)	mg/L			9.3	0.5		
Total Organic Carbon (C)	mg/L	9.5	0.50	9.5	0.50		
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010
pH	pH	5.56	N/A	5.33	N/A		
Total Phosphorus	mg/L	0.024	0.020				
Salinity	N/A	<2.0	2.0				
Reactive Silica (SiO2)	mg/L	3.0	0.50	3.1	0.50	3.1	0.50
Total Suspended Solids	mg/L	<1.0	1.0				
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	<2.0	2.0	<2.0	2.0
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		IMC335		IMC336		IMC336	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW6	RDL	SW6 FILTERED	RDL	SW6 FILTERED Lab-Dup	RDL
Turbidity	NTU	0.84	0.10	0.16	0.10		
WAD Cyanide (Free)	mg/L	<0.0030	0.0030				
Conductivity	uS/cm	27	1.0	26	1.0		
RADIONUCLIDE							
Radium-226	Bq/L	<0.010	0.010				
Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	N/A				
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		IMC331		IMC332		IMC332		IMC333	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED		SW13 SURFACE FILTERED Lab-Dup	RDL	SW13 DEPTH	RDL

Metals									
Dissolved Mercury (Hg)	ug/L			<0.013		<0.013		0.013	
Total Mercury (Hg)	ug/L	<0.013	0.013					<0.013	0.013
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate									

Maxxam ID		IMC334		IMC335		IMC336	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW6	RDL	SW6 FILTERED	RDL

Metals							
Dissolved Mercury (Hg)	ug/L	<0.013	0.013			<0.013	0.013
Total Mercury (Hg)	ug/L			<0.013	0.013		
RDL = Reportable Detection Limit							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		IMC331		IMC332		IMC332		IMC333	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED		SW13 SURFACE FILTERED Lab-Dup	RDL	SW13 DEPTH	RDL
Metals									
Dissolved Aluminum (Al)	ug/L			240		240	5.0		
Total Aluminum (Al)	ug/L	240	5.0					250	5.0
Dissolved Antimony (Sb)	ug/L			<1.0		<1.0	1.0		
Total Antimony (Sb)	ug/L	<1.0	1.0					<1.0	1.0
Dissolved Arsenic (As)	ug/L			1.3		1.3	1.0		
Total Arsenic (As)	ug/L	1.4	1.0					1.4	1.0
Dissolved Barium (Ba)	ug/L			4.9		4.9	1.0		
Total Barium (Ba)	ug/L	4.8	1.0					5.0	1.0
Dissolved Beryllium (Be)	ug/L			<1.0		<1.0	1.0		
Total Beryllium (Be)	ug/L	<1.0	1.0					<1.0	1.0
Dissolved Bismuth (Bi)	ug/L			<2.0		<2.0	2.0		
Total Bismuth (Bi)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Boron (B)	ug/L			<50		<50	50		
Total Boron (B)	ug/L	<50	50					<50	50
Dissolved Cadmium (Cd)	ug/L			0.023		0.021	0.010		
Total Cadmium (Cd)	ug/L	0.028	0.010					0.026	0.010
Dissolved Calcium (Ca)	ug/L			730		720	100		
Total Calcium (Ca)	ug/L	750	100					740	100
Dissolved Chromium (Cr)	ug/L			2.3		2.1	1.0		
Total Chromium (Cr)	ug/L	<1.0	1.0					<1.0	1.0
Dissolved Cobalt (Co)	ug/L			<0.40		<0.40	0.40		
Total Cobalt (Co)	ug/L	<0.40	0.40					<0.40	0.40
Dissolved Copper (Cu)	ug/L			<2.0		<2.0	2.0		
Total Copper (Cu)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Iron (Fe)	ug/L			260		260	50		
Total Iron (Fe)	ug/L	260	50					290	50
Dissolved Lead (Pb)	ug/L			<0.50		<0.50	0.50		
Total Lead (Pb)	ug/L	<0.50	0.50					<0.50	0.50
Dissolved Magnesium (Mg)	ug/L			370		370	100		
Total Magnesium (Mg)	ug/L	360	100					370	100
Dissolved Manganese (Mn)	ug/L			60		60	2.0		
Total Manganese (Mn)	ug/L	58	2.0					58	2.0
Dissolved Molybdenum (Mo)	ug/L			<2.0		<2.0	2.0		
Total Molybdenum (Mo)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Nickel (Ni)	ug/L			<2.0		<2.0	2.0		
RDL = Reportable Detection Limit									
Lab-Dup = Laboratory Initiated Duplicate									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		IMC331		IMC332		IMC332		IMC333	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED		SW13 SURFACE FILTERED Lab-Dup	RDL	SW13 DEPTH	RDL
Total Nickel (Ni)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Phosphorus (P)	ug/L			<100		<100	100		
Total Phosphorus (P)	ug/L	<100	100					<100	100
Dissolved Potassium (K)	ug/L			220		220	100		
Total Potassium (K)	ug/L	190	100					210	100
Dissolved Selenium (Se)	ug/L			<1.0		<1.0	1.0		
Total Selenium (Se)	ug/L	<1.0	1.0					<1.0	1.0
Dissolved Silver (Ag)	ug/L			<0.10		<0.10	0.10		
Total Silver (Ag)	ug/L	<0.10	0.10					<0.10	0.10
Dissolved Sodium (Na)	ug/L			2800		2800	100		
Total Sodium (Na)	ug/L	2800	100					3100	100
Dissolved Strontium (Sr)	ug/L			6.7		6.1	2.0		
Total Strontium (Sr)	ug/L	6.7	2.0					6.0	2.0
Dissolved Thallium (Tl)	ug/L			<0.10		<0.10	0.10		
Total Thallium (Tl)	ug/L	<0.10	0.10					<0.10	0.10
Dissolved Tin (Sn)	ug/L			<2.0		<2.0	2.0		
Total Tin (Sn)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Titanium (Ti)	ug/L			<2.0		<2.0	2.0		
Total Titanium (Ti)	ug/L	3.0	2.0					2.1	2.0
Dissolved Uranium (U)	ug/L			<0.10		<0.10	0.10		
Total Uranium (U)	ug/L	<0.10	0.10					<0.10	0.10
Dissolved Vanadium (V)	ug/L			<2.0		<2.0	2.0		
Total Vanadium (V)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Zirconium (Zr)	ug/L			<2.0		<2.0	2.0		
Total Zirconium (Zr)	ug/L	<2.0	2.0					<2.0	2.0
Dissolved Zinc (Zn)	ug/L			<5.0		<5.0	5.0		
Total Zinc (Zn)	ug/L	<5.0	5.0					6.1	5.0

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		IMC334		IMC335		IMC336	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW6	RDL	SW6 FILTERED	RDL
Metals							
Dissolved Aluminum (Al)	ug/L	230	5.0			230	5.0
Total Aluminum (Al)	ug/L			240	5.0		
Dissolved Antimony (Sb)	ug/L	<1.0	1.0			<1.0	1.0
Total Antimony (Sb)	ug/L			<1.0	1.0		
Dissolved Arsenic (As)	ug/L	1.3	1.0			1.2	1.0
Total Arsenic (As)	ug/L			1.4	1.0		
Dissolved Barium (Ba)	ug/L	4.9	1.0			5.0	1.0
Total Barium (Ba)	ug/L			4.9	1.0		
Dissolved Beryllium (Be)	ug/L	<1.0	1.0			<1.0	1.0
Total Beryllium (Be)	ug/L			<1.0	1.0		
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0			<2.0	2.0
Total Bismuth (Bi)	ug/L			<2.0	2.0		
Dissolved Boron (B)	ug/L	<50	50			<50	50
Total Boron (B)	ug/L			<50	50		
Dissolved Cadmium (Cd)	ug/L	0.037	0.010			0.023	0.010
Total Cadmium (Cd)	ug/L			0.020	0.010		
Dissolved Calcium (Ca)	ug/L	760	100			730	100
Total Calcium (Ca)	ug/L			730	100		
Dissolved Chromium (Cr)	ug/L	<1.0	1.0			<1.0	1.0
Total Chromium (Cr)	ug/L			<1.0	1.0		
Dissolved Cobalt (Co)	ug/L	<0.40	0.40			<0.40	0.40
Total Cobalt (Co)	ug/L			<0.40	0.40		
Dissolved Copper (Cu)	ug/L	<2.0	2.0			<2.0	2.0
Total Copper (Cu)	ug/L			<2.0	2.0		
Dissolved Iron (Fe)	ug/L	250	50			250	50
Total Iron (Fe)	ug/L			280	50		
Dissolved Lead (Pb)	ug/L	<0.50	0.50			<0.50	0.50
Total Lead (Pb)	ug/L			<0.50	0.50		
Dissolved Magnesium (Mg)	ug/L	370	100			380	100
Total Magnesium (Mg)	ug/L			350	100		
Dissolved Manganese (Mn)	ug/L	59	2.0			59	2.0
Total Manganese (Mn)	ug/L			58	2.0		
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0			<2.0	2.0
Total Molybdenum (Mo)	ug/L			<2.0	2.0		
Dissolved Nickel (Ni)	ug/L	<2.0	2.0			<2.0	2.0
RDL = Reportable Detection Limit							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		IMC334		IMC335		IMC336	
Sampling Date		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 DEPTH FILTERED	RDL	SW6	RDL	SW6 FILTERED	RDL
Total Nickel (Ni)	ug/L			<2.0	2.0		
Dissolved Phosphorus (P)	ug/L	<100	100			<100	100
Total Phosphorus (P)	ug/L			<100	100		
Dissolved Potassium (K)	ug/L	230	100			220	100
Total Potassium (K)	ug/L			200	100		
Dissolved Selenium (Se)	ug/L	<1.0	1.0			<1.0	1.0
Total Selenium (Se)	ug/L			<1.0	1.0		
Dissolved Silver (Ag)	ug/L	<0.10	0.10			<0.10	0.10
Total Silver (Ag)	ug/L			<0.10	0.10		
Dissolved Sodium (Na)	ug/L	2800	100			2800	100
Total Sodium (Na)	ug/L			2700	100		
Dissolved Strontium (Sr)	ug/L	6.0	2.0			6.1	2.0
Total Strontium (Sr)	ug/L			6.5	2.0		
Dissolved Thallium (Tl)	ug/L	<0.10	0.10			<0.10	0.10
Total Thallium (Tl)	ug/L			<0.10	0.10		
Dissolved Tin (Sn)	ug/L	<2.0	2.0			<2.0	2.0
Total Tin (Sn)	ug/L			<2.0	2.0		
Dissolved Titanium (Ti)	ug/L	<2.0	2.0			<2.0	2.0
Total Titanium (Ti)	ug/L			2.3	2.0		
Dissolved Uranium (U)	ug/L	<0.10	0.10			<0.10	0.10
Total Uranium (U)	ug/L			<0.10	0.10		
Dissolved Vanadium (V)	ug/L	<2.0	2.0			<2.0	2.0
Total Vanadium (V)	ug/L			<2.0	2.0		
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0			<2.0	2.0
Total Zirconium (Zr)	ug/L			<2.0	2.0		
Dissolved Zinc (Zn)	ug/L	<5.0	5.0			<5.0	5.0
Total Zinc (Zn)	ug/L			<5.0	5.0		

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		IMC331		IMC332		IMC333		IMC334	
Sampling Date		2018/12/05		2018/12/05		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01		694566-04-01		694566-04-01	
	UNITS	SW13 SURFACE	RDL	SW13 SURFACE FILTERED	RDL	SW13 DEPTH	RDL	SW13 DEPTH FILTERED	RDL
Metals									
Dissolved Tungsten (W)	ug/L			<1.0	1.0			<1.0	1.0
Total Tungsten (W)	ug/L	<1.0	1.0			<1.0	1.0		
RDL = Reportable Detection Limit									

Maxxam ID		IMC335		IMC336	
Sampling Date		2018/12/05		2018/12/05	
COC Number		694566-04-01		694566-04-01	
	UNITS	SW6	RDL	SW6 FILTERED	RDL
Metals					
Dissolved Tungsten (W)	ug/L			<1.0	1.0
Total Tungsten (W)	ug/L	<1.0	1.0		
RDL = Reportable Detection Limit					

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-0.7°C
Package 2	0.0°C

Sample IMC331 [SW13 SURFACE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample IMC332 [SW13 SURFACE FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample IMC333 [SW13 DEPTH] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample IMC334 [SW13 DEPTH FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.


Sample IMC335 [SW6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample IMC336 [SW6 FILTERED] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

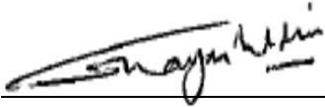
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist



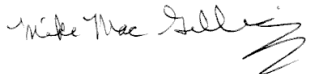
Miryam Assayag



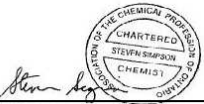
Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Gina Thompson, Inorganics General Chemistry Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)



Steven Simpson, Lab Director

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**DALHOUSIE
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Inspiring Minds

Department of Oceanography
1355 Oxford St
Halifax, NS
B3H 4R2

Determination of chlorophyll a by fluorescence

Client: Maxxam Analytics Inc., 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Received: 2018-12-06

Project #: B8W5998

Completed: 2018-12-10

Hugh MacIntyre

Hugh MacIntyre, Ph.D.

Chl *a* (chlorophyll *a*; µg L⁻¹) determined by the acidification method (Holm-Hansen et al., 1965). Estimates made with the non-acidification method (Welschmeyer, 1994) are shown for comparison.

The non-acidification method is considered more reliable than the acidification method in correcting for bias due to the contributions of chlorophyll *b* and chlorophyll degradation products. Holm-Hansen O, Lorenzen CJ, Holmes RW, Strickland JDH (1965) Fluorometric determination of chlorophyll.

J Conseil 30:3-15

Welschmeyer NA (1994) Fluorometric analysis of chlorophyll *a* in the presence of chlorophyll *b* and phaeopigments.

Limnol Oceanogr 39:1985-1992

Contractor ID	Client ID	Chl <i>a</i> (acidification)	Chl <i>a</i> (non-acidification)
IMC331-12R	SW13 SURFACE	0.414	0.439
IMC333-12R	SW13 DEPTH	0.343	0.377
INC335-12R	SW6	0.416	0.455



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Chain Of Custody Record

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INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B8W5998	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	Project Manager
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			Maryann Comeau
				Sampled By		C#694566-04-01	

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)													Turnaround Time (TAT) Required:		
		Field Filtered & Preserved	Lab Filtration Required	Atlantic RCP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAALL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis		
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal																	Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM																	Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required:
1	SW 13 surface	18/12/05	11:20	X	X	X	X	X	X	X	X	X	X	X			
2	SW 13 depth	18/12/05	-	X	X	X	X	X	X	X	X	X	X	X			
3	SW 6	18/12/05	-	X	X	X	X	X	X	X	X	X	X	X			
4																	
5				X	X	X	X	X	X	X	X	X	X	X			
6				X	X	X	X	X	X	X	X	X	X	X			
7																	
8																	
9																	2018 DEC 5 15:43
10																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only	
<i>Ryan Gardiner</i> Ryan Gardiner	18/12/05	15:45	<i>R.M. SRTG</i> R.M. SRTG				Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt: -1.1 / -1.2 / -1.3
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.							Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No	
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.							Write: Maxxam Yellow: Client	



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Chain Of Custody Record

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INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	38W5998	694566
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772	Phone	(902) 880-6375	Project Name		C#694566-02-02	Maryann Comeau
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:	
		Field Filtered & Preserved	Phosphorus Total Colourimetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al. RCAP-MS Diss(Field/fit) Includes Zirconium	Mercury - Dissolved (CVAA,LL)	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Please provide advance notice for rush projects	
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal		Lab Filtration Required	X	X	X	X	X	X	X	X	X	Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans > 5 days - contact your Project Manager for details.	

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Phosphorus Total Colourimetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al. RCAP-MS Diss(Field/fit) Includes Zirconium	Mercury - Dissolved (CVAA,LL)	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 13 surface	18/12/05	11:15	H ₂ O			X	X	X	X	X						
2	SW 13 depth	"	11:45	"								X	X	X	X		
3	SW 6	"	15:00	"			X	X	X	X	X						
4												X	X	X	X		
5							X	X	X	X	X						
6												X	X	X	X		
7							X	X	X	X	X						
8												X	X	X	X		
9							X	X	X	X	X						
10												X	X	X	X		2018 DEC 5 15:43

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only		
<i>Ryan Gardiner</i>		18/12/05	15:45	<i>Ryan Gardiner</i>					Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
									<input type="checkbox"/>	-1.12/-1.22	<input type="checkbox"/> Yes <input type="checkbox"/> No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

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Chain Of Custody Record

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INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B8W5998	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	Project Manager
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			Maryann Comeau
				Sampled By		C#694566-04-01	

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:			
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal		Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	Please provide advance notice for rush projects	
Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input type="checkbox"/> Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.															
Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ <input type="checkbox"/>															
# of Bottles: _____ Comments / Hazards / Other Required Analysis: _____															

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 13 surface	18/12/05		H ₂ O	✓		X	X	X	X	X	X	X	X	X	X		
2	SW 13 depth	18/12/05		-	✓		X	X	X	X	X	X	X	X	X	X		
3	SW 6	18/12/05		-	✓		X	X	X	X	X	X	X	X	X	X		
4																		
5							X	X	X	X	X	X	X	X	X	X		
6							X	X	X	X	X	X	X	X	X	X		
7																		
8																		
9																		2018 DEC 5 15:43
10																		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only
<i>Ryan Gardiner</i>	18/12/05	15:45	<i>Ryan Gardiner</i>				Time Sensitive <input type="checkbox"/> Temperature (°C) on Receipt: <i>-1.0 / -1.2</i> Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.							White: Maxxam Yellow: Client
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.							



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Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	38W5998	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name			Maryann Comeau
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			

Regulatory Criteria:		Special Instructions		ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:				
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sudge/Metal				Field Filtered & Preserved		Lab Filtration Required		Phosphorus Total Colourimetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al. RCAP-MS Diss(Field/Filter) Includes Zirconium	Mercury - Dissolved (CVAA,LL)	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Please provide advance notice for rush projects	
Regular (Standard) TAT:																		
(will be applied if Rush TAT is not specified):																		
Standard TAT = 5-7 Working days for most tests.																		
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.																		
Job Specific Rush TAT (if applies to entire submission)																		
Date Required: Time Required:																		
# of Bottles Comments / Hazards / Other Required Analysis																		
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix														
1	SW 13 surface	18/12/05	11:15	H ₂ O	X	X	X	X	X									
2	SW 13 depth	"	11:45	"						X	X	X	X					
3	SW 6	"	13:00	"	X	X	X	X	X									
4										X	X	X	X					
5					X	X	X	X	X									
6										X	X	X	X					
7					X	X	X	X	X									
8										X	X	X	X					
9					X	X	X	X	X									
10										X	X	X	X					

2018 DEC 5 15:43

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only	
<i>Ryan Gardiner</i>		18/12/05	15:45	<i>Ryan Gardiner</i>					Time Sensitive	Temperature (°C) on Receipt
									<input type="checkbox"/>	-1.10/-1.21
									Custody Seal Intact on Cooler?	
									<input type="checkbox"/> Yes <input type="checkbox"/> No	
									White: Maxxam Yellow: Client	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Methyl Mercury Results

Flett Research Ltd.

440 DeSaberry Ave. Winnipeg, MB R2L 0Y7
 Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR121818JS3
 Page 1 of 1

CLIENT: Maxxam Analytics - Bedford: B8W5998

200 Bluewater Road, Suite 105
 Bedford, NS B4B 1G9

Date Received: December 7, 2018

Sampling Date: December 5, 2018

Matrix: Water

Transaction ID: 870

PO/Contract No.:

Date Analysed: December 18, 2018

Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 1)

Comments: Samples were yellow in colour with particulates.

Detection Limit: 0.08 ng/L (ML). MDL=0.03 ng/L (based on 7 replicates of method blanks with 98% confidence level and the analysis of 45mL of raw sample and 20mL of distillate). For reporting purpose samples will be flagged below the ML which is considered a practical detection limit.

Estimated Uncertainty: The estimated uncertainty of this method has preliminarily been determined to be $\pm 10\%$ at methyl mercury concentrations of 0.5 and 2.5 ng/L (95% confidence). Uncertainty at 0.1 ng/L is 13% (95% confidence).

Results authorized by Dr. Robert J. Flett, Chief Scientist

Blanks		Pg of CH3Hg in the Ethylation Blank	Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L) <small>assumes volume is 30mL</small>					
Ethylation blank (H ₂ O+Reagents)		0.09	6.67	0.003					
Mean Eth. Blank (last 30 runs)		0.11							
		Net Pg CH3Hg in the Method Blank <small>(Eth. Blank subtracted)</small>	Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) <small>[Eth. Blank subtracted]</small>					
Method Blank 1		0.09	13.41	0.00					
Method Blank 2		0.09	13.67	0.00					
Method Blank 3		0.05	10.52	0.00					
Mean Method Blank				0.00					
Mean Calibration Factor <small>(area units / pg)</small>		73.82 \pm 5.1 %RSD							
Spike Recovery		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)	
Matrix Spike (MS) and Matrix Spike Duplicate (MSD)		Mean of Spike Recoveries from December 18, 2018							
		91.6							
QC Samples		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)	
Ongoing Precision & Recovery (OPR)		MeOPR ID1701 (1000ng/L)	(beginning of run)	862.61	0.050	100%	912	91.2	
		MeOPR ID1701 (1000ng/L)	(end of run)	840.67	0.050	100%	941	94.1	
		Mean of MeOPR					927	92.7	
Alternate Source Standard (A.S.S)		A.S.S.-Alfa ID1302 (1000 ng/L)		3114.54		100%	1053	105.3	
LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) <small>[Ethylation & Method Blank subtracted] [recovery corrected]</small>
93341	IMC331-11R	SW13 SURFACE	December 5, 2018			181.47	49.11	91.6%	0.11
93342	IMC333-11R	SW13 DEPTH	December 5, 2018		DupA1	188.57	47.24	91.6%	0.12
93342	IMC333-11R	SW13 DEPTH	December 5, 2018		DupA2	205.36	49.43	91.6%	0.12
93343	IMC335-11R	SW6	December 5, 2018			186.66	48.06	91.6%	0.11

Q:\Clients M-Z\Maxxam Analytics - Bedford\2018(870)\Methyl Mercury\MTWATR121818JS3.xls

* : See 'Comments' section above for discussion.

This test report shall not be reproduced, except in full, without written approval of the laboratory.

Note: Results relate only to the items tested.

Dup : Duplicate - two subsamples of the same sample carried through the analytical procedure in an identical manner.



ISO/IEC 17025:2005 Accredited with the Canadian Association for Laboratory Accreditation

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/05/07
Report #: R5700411
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9A0599
Received: 2019/04/16, 17:00

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO3) in water (6)	4	N/A	2019/04/23		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	3	N/A	2019/04/18	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	4	N/A	2019/04/22	N/A	SM 23 4500-CO2 D
Alkalinity	7	N/A	2019/04/18	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	7	N/A	2019/04/22	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	4	N/A	2019/04/22	ATL SOP 00042	SM 23 5220D m
Colour	7	N/A	2019/04/22	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	3	2019/04/23	2019/04/23	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (7)	3	N/A	2019/04/22	ATL SOP 00203	SM 23 5310B m
Conductance - water	3	N/A	2019/04/18	ATL SOP 00004	SM 23 2510B m
Conductance - water	4	N/A	2019/04/22	ATL SOP 00004	SM 23 2510B m
Fluoride	4	N/A	2019/04/22	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	4	N/A	2019/04/22	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	3	N/A	2019/04/23	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	3	2019/04/22	2019/04/22	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	4	2019/04/22	2019/04/22	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	3	N/A	2019/04/22	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	4	2019/04/18	2019/04/22	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	3	N/A	2019/04/22	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	3	N/A	2019/04/26	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2019/04/22	N/A	Auto Calc.
Ion Balance (% Difference)	3	N/A	2019/04/23	N/A	Auto Calc.
Anion and Cation Sum	3	N/A	2019/04/22	N/A	Auto Calc.
Anion and Cation Sum	4	N/A	2019/04/23	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	2	2019/04/22	2019/04/24	STL SOP-00035	MA300-CN 1.2 R3 m
Weak Acid Dissociable Cyanides (2)	1	2019/04/24	2019/04/24	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	4	N/A	2019/04/22	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water	3	N/A	2019/04/23	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	7	N/A	2019/04/22	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	7	N/A	2019/04/18	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	7	N/A	2019/04/22	ATL SOP 00018	ASTM D3867-16
pH (8)	3	N/A	2019/04/18	ATL SOP 00003	SM 23 4500-H+ B m

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/05/07
Report #: R5700411
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9A0599
Received: 2019/04/16, 17:00

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
pH (8)	4	N/A	2019/04/22	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	7	N/A	2019/04/18	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (3, 9)	3	N/A	2019/05/05	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (6)	4	N/A	2019/04/23		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	4	N/A	2019/04/22	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	3	N/A	2019/04/23	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	4	N/A	2019/04/22	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	3	N/A	2019/04/23	ATL SOP 00049	Auto Calc.
Reactive Silica	7	N/A	2019/04/22	ATL SOP 00022	EPA 366.0 m
Sulphate	7	N/A	2019/04/18	ATL SOP 00023	ASTM D516-16 m
Chlorophyll A (Sub from Bedford) (4)	3	2019/04/18	2019/04/23		
Methyl Mercury (sub from Bedford) (5)	3	N/A	2019/04/22		EPA 1630
Total Dissolved Solids (Filt. Residue)	4	2019/04/18	2019/04/25	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	3	N/A	2019/04/22	N/A	Auto Calc.
Total Dissolved Solids (TDS calc)	4	N/A	2019/04/23	N/A	Auto Calc.
Organic carbon - Total (TOC) (10)	6	N/A	2019/04/18	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (10)	1	N/A	2019/04/22	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	4	2019/04/22	2019/04/23	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	4	2019/04/18	2019/04/25	ATL SOP 00007	SM 23 2540D m
Turbidity	7	N/A	2019/04/18	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/05/07
Report #: R5700411
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9A0599

Received: 2019/04/16, 17:00

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

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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 Maxxam Analytics Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Maxxam Analytics Kitimat
- (4) This test was performed by Dalhousie Dept of Oceanography
- (5) This test was performed by Sub Bedford to Flett Research
- (6) Non-accredited test method
- (7) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (8) 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.
- (9) Radium-226 results have not been corrected for blanks.
- (10) 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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV486			JLV486			JLV487		
Sampling Date		2019/04/16 12:45			2019/04/16 12:45			2019/04/16 13:15		
COC Number		707748-04-01			707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	RDL	QC Batch	SW13 SURFACE Lab-Dup	RDL	QC Batch	SW13 DEPTH	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.130	N/A	6074430				0.130	N/A	6074430
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425				<1.0	1.0	6074425
Calculated TDS	mg/L	11	1.0	6074439				10	1.0	6074439
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425				<1.0	1.0	6074425
Cation Sum	me/L	0.180	N/A	6074430				0.180	N/A	6074430
Hardness (CaCO3)	mg/L	2.5	1.0	6074427				2.6	1.0	6074427
Ion Balance (% Difference)	%	16.1	N/A	6074428				16.1	N/A	6074428
Langelier Index (@ 20C)	N/A	NC		6074436				NC		6074436
Langelier Index (@ 4C)	N/A	NC		6074438				NC		6074438
Nitrate (N)	mg/L	<0.050	0.050	6074432				<0.050	0.050	6074432
Saturation pH (@ 20C)	N/A	NC		6074436				NC		6074436
Saturation pH (@ 4C)	N/A	NC		6074438				NC		6074438
Inorganics										
Acidity	mg/L	<5.0	5.0	6082237				<5.0	5.0	6082237
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6076646				<5.0	5.0	6076646
Total Chemical Oxygen Demand	mg/L	<20	20	6080296	<20	20	6080296	<20	20	6080296
Dissolved Chloride (Cl-)	mg/L	4.6	1.0	6076647				4.6	1.0	6076647
Colour	TCU	47	5.0	6076650				47	5.0	6076650
Total Dissolved Solids	mg/L	22	10	6084939				22	10	6084939
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6080178				<0.10	0.10	6080178
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6076652				<0.050	0.050	6076652
Nitrite (N)	mg/L	<0.010	0.010	6076653				<0.010	0.010	6076653
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6080273				<0.050	0.050	6080273
Total Organic Carbon (C)	mg/L	6.2	0.50	6076584				6.0	0.50	6074612
Orthophosphate (P)	mg/L	<0.010	0.010	6076651				<0.010	0.010	6076651
pH	pH	5.62	N/A	6080174				5.41	N/A	6080174
Total Phosphorus	mg/L	0.023	0.020	6080170				0.021	0.020	6080170
Salinity	N/A	<2.0	2.0	6082648				<2.0	2.0	6082648
Reactive Silica (SiO2)	mg/L	2.0	0.50	6076649				2.0	0.50	6076649
Total Suspended Solids	mg/L	1.6	1.0	6076775				<1.0	1.0	6076775
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6076648				<2.0	2.0	6076648
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV486			JLV486			JLV487		
Sampling Date		2019/04/16 12:45			2019/04/16 12:45			2019/04/16 13:15		
COC Number		707748-04-01			707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	RDL	QC Batch	SW13 SURFACE Lab-Dup	RDL	QC Batch	SW13 DEPTH	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6082581				<0.0050	0.0050	6082581
Turbidity	NTU	1.1	0.10	6076609				0.99	0.10	6076609
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6087552				<0.0030	0.0030	6087760
Conductivity	uS/cm	22	1.0	6080177				24	1.0	6080177
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6077820				<0.010	0.010	6077820
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6076684				ATTACHED	N/A	6076684
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV488			JLV489		JLV490		
Sampling Date		2019/04/16			2019/04/16 12:45		2019/04/16 13:15		
COC Number		707748-04-01			707748-04-01		707748-04-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	QC Batch	SW13 DEPTH FF	RDL	QC Batch

Calculated Parameters									
Anion Sum	me/L	0.00	N/A	6074430	0.120	6074430	0.130	N/A	6074430
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425	<1.0	6074425	<1.0	1.0	6074425
Calculated TDS	mg/L	<1.0	1.0	6074439	10	6074439	11	1.0	6074439
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425	<1.0	6074425	<1.0	1.0	6074425
Cation Sum	me/L	0.00	N/A	6074430	0.170	6074430	0.180	N/A	6074430
Hardness (CaCO3)	mg/L	<1.0	1.0	6074427	2.6	6074427	3.0	1.0	6074427
Ion Balance (% Difference)	%				17.2	6074428	16.1	N/A	6074428
Langelier Index (@ 20C)	N/A	NC		6074436	NC	6074436	NC		6074436
Langelier Index (@ 4C)	N/A	NC		6074438	NC	6074438	NC		6074438
Nitrate (N)	mg/L	<0.050	0.050	6074432	<0.050	6074432	<0.050	0.050	6074432
Saturation pH (@ 20C)	N/A	NC		6074436	NC	6074436	NC		6074436
Saturation pH (@ 4C)	N/A	NC		6074438	NC	6074438	NC		6074438

Inorganics									
Acidity	mg/L	<5.0	5.0	6082237					
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6076646	<5.0	6076646	<5.0	5.0	6076646
Total Chemical Oxygen Demand	mg/L	<20	20	6080296					
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6076647	4.4	6076647	4.7	1.0	6076647
Colour	TCU	<5.0	5.0	6076650	47	6076650	48	5.0	6076650
Total Dissolved Solids	mg/L	<10	10	6084939					
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6080178					
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6076652	<0.050	6076652	<0.050	0.050	6076652
Nitrite (N)	mg/L	<0.010	0.010	6076653	<0.010	6076653	<0.010	0.010	6076653
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6082128	<0.050	6082128	<0.050	0.050	6080273
Dissolved Organic Carbon (C)	mg/L				5.3	6076586	5.6	0.5	6076586
Total Organic Carbon (C)	mg/L	<0.50	0.50	6074612	5.6	6074612	5.8	0.50	6074612
Orthophosphate (P)	mg/L	<0.010	0.010	6076651	<0.010	6076651	<0.010	0.010	6076651
pH	pH	5.90	N/A	6080174	5.69	6076499	5.86	N/A	6076499
Total Phosphorus	mg/L	<0.020	0.020	6080170					
Salinity	N/A	<2.0	2.0	6082648					
Reactive Silica (SiO2)	mg/L	<0.50	0.50	6076649	2.0	6076649	2.0	0.50	6076649
Total Suspended Solids	mg/L	<1.0	1.0	6076775					
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6076648	<2.0	6076648	<2.0	2.0	6076648

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV488			JLV489		JLV490		
Sampling Date		2019/04/16			2019/04/16 12:45		2019/04/16 13:15		
COC Number		707748-04-01			707748-04-01		707748-04-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	QC Batch	SW13 DEPTH FF	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6082581					
Turbidity	NTU	<0.10	0.10	6076609	<0.10	6076609	0.10	0.10	6076609
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6087552					
Conductivity	uS/cm	4.1	1.0	6080177	23	6076504	23	1.0	6076504
RADIONUCLIDE									
Radium-226	Bq/L	<0.010	0.010	6077820					
Subcontracted Analysis									
Subcontract Parameter	N/A	ATTACHED	N/A	6076684					
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV491			JLV491		
Sampling Date		2019/04/16			2019/04/16		
COC Number		707748-04-01			707748-04-01		
	UNITS	FIELD/FILTER BLANK FF	RDL	QC Batch	FIELD/FILTER BLANK FF Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.00	N/A	6074430			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425			
Calculated TDS	mg/L	<1.0	1.0	6074439			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6074425			
Cation Sum	me/L	0.0200	N/A	6074430			
Hardness (CaCO3)	mg/L	<1.0	1.0	6074427			
Ion Balance (% Difference)	%	100	N/A	6074428			
Langelier Index (@ 20C)	N/A	NC		6074436			
Langelier Index (@ 4C)	N/A	NC		6074438			
Nitrate (N)	mg/L	<0.050	0.050	6074432			
Saturation pH (@ 20C)	N/A	NC		6074436			
Saturation pH (@ 4C)	N/A	NC		6074438			
Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6076646			
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6076647			
Colour	TCU	<5.0	5.0	6076650			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6076652			
Nitrite (N)	mg/L	<0.010	0.010	6076653			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6082128			
Dissolved Organic Carbon (C)	mg/L	<0.5	0.5	6076586	<0.5	0.5	6076586
Total Organic Carbon (C)	mg/L	<0.50	0.50	6074612			
Orthophosphate (P)	mg/L	<0.010	0.010	6076651			
pH	pH	5.88	N/A	6076499			
Reactive Silica (SiO2)	mg/L	<0.50	0.50	6076649			
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6076648			
Turbidity	NTU	<0.10	0.10	6076609			
Conductivity	uS/cm	1.4	1.0	6076504			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		JLV492		
Sampling Date		2019/04/16		
COC Number		707748-04-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	0.00	N/A	6074430
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6074425
Calculated TDS	mg/L	<1.0	1.0	6074439
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6074425
Cation Sum	me/L	0.00	N/A	6074430
Hardness (CaCO ₃)	mg/L	<1.0	1.0	6074427
Langelier Index (@ 20C)	N/A	NC		6074436
Langelier Index (@ 4C)	N/A	NC		6074438
Nitrate (N)	mg/L	<0.050	0.050	6074432
Saturation pH (@ 20C)	N/A	NC		6074436
Saturation pH (@ 4C)	N/A	NC		6074438
Inorganics				
Acidity	mg/L	<5.0	5.0	6082237
Total Alkalinity (Total as CaCO ₃)	mg/L	<5.0	5.0	6076654
Total Chemical Oxygen Demand	mg/L	<20	20	6080296
Dissolved Chloride (Cl ⁻)	mg/L	<1.0	1.0	6076656
Colour	TCU	<5.0	5.0	6076661
Total Dissolved Solids	mg/L	<10	10	6084939
Dissolved Fluoride (F ⁻)	mg/L	<0.10	0.10	6080178
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6076664
Nitrite (N)	mg/L	<0.010	0.010	6076665
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6080273
Total Organic Carbon (C)	mg/L	<0.50	0.50	6074612
Orthophosphate (P)	mg/L	<0.010	0.010	6076663
pH	pH	5.95	N/A	6080174
Total Phosphorus	mg/L	<0.020	0.020	6080170
Salinity	N/A	<2.0	2.0	6082648
Reactive Silica (SiO ₂)	mg/L	<0.50	0.50	6076660
Total Suspended Solids	mg/L	<1.0	1.0	6076775
Dissolved Sulphate (SO ₄)	mg/L	<2.0	2.0	6076657
Turbidity	NTU	<0.10	0.10	6076609
Conductivity	uS/cm	<1.0	1.0	6080177
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		JLV486	JLV487	JLV488			JLV489		
Sampling Date		2019/04/16 12:45	2019/04/16 13:15	2019/04/16			2019/04/16 12:45		
COC Number		707748-04-01	707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	SW13 DEPTH	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	RDL	QC Batch

Metals									
Dissolved Mercury (Hg)	ug/L						<0.013	0.013	6076633
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	0.013	6076631			
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam ID		JLV490	JLV491			JLV492		
Sampling Date		2019/04/16 13:15	2019/04/16			2019/04/16		
COC Number		707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 DEPTH FF	FIELD/FILTER BLANK FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6076633			
Total Mercury (Hg)	ug/L					<0.013	0.013	6076631
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JLV486	JLV487	JLV488			JLV489		
Sampling Date		2019/04/16 12:45	2019/04/16 13:15	2019/04/16			2019/04/16 12:45		
COC Number		707748-04-01	707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	SW13 DEPTH	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	RDL	QC Batch
Metals									
Dissolved Aluminum (Al)	ug/L						140	5.0	6076746
Total Aluminum (Al)	ug/L	160	160	<5.0	5.0	6076607			
Dissolved Antimony (Sb)	ug/L						<1.0	1.0	6076746
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	1.0	6076607			
Dissolved Arsenic (As)	ug/L						<1.0	1.0	6076746
Total Arsenic (As)	ug/L	1.1	1.1	<1.0	1.0	6076607			
Dissolved Barium (Ba)	ug/L						3.3	1.0	6076746
Total Barium (Ba)	ug/L	3.6	3.9	<1.0	1.0	6076607			
Dissolved Beryllium (Be)	ug/L						<1.0	1.0	6076746
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	1.0	6076607			
Dissolved Bismuth (Bi)	ug/L						<2.0	2.0	6076746
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
Dissolved Boron (B)	ug/L						<50	50	6076746
Total Boron (B)	ug/L	<50	<50	<50	50	6076607			
Dissolved Cadmium (Cd)	ug/L						0.017	0.010	6076746
Total Cadmium (Cd)	ug/L	0.016	0.018	<0.010	0.010	6076607			
Dissolved Calcium (Ca)	ug/L						590	100	6076746
Total Calcium (Ca)	ug/L	550	570	<100	100	6076607			
Dissolved Chromium (Cr)	ug/L						1.0	1.0	6076746
Total Chromium (Cr)	ug/L	1.2	1.1	<1.0	1.0	6076607			
Dissolved Cobalt (Co)	ug/L						<0.40	0.40	6076746
Total Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	0.40	6076607			
Dissolved Copper (Cu)	ug/L						<0.50	0.50	6076746
Total Copper (Cu)	ug/L	<0.50	1.6	<0.50	0.50	6076607			
Dissolved Iron (Fe)	ug/L						130	50	6076746
Total Iron (Fe)	ug/L	170	180	<50	50	6076607			
Dissolved Lead (Pb)	ug/L						<0.50	0.50	6076746
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	6076607			
Dissolved Magnesium (Mg)	ug/L						280	100	6076746
Total Magnesium (Mg)	ug/L	290	280	<100	100	6076607			
Dissolved Manganese (Mn)	ug/L						65	2.0	6076746
Total Manganese (Mn)	ug/L	67	66	<2.0	2.0	6076607			
Dissolved Molybdenum (Mo)	ug/L						<2.0	2.0	6076746
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JLV486	JLV487	JLV488			JLV489		
Sampling Date		2019/04/16 12:45	2019/04/16 13:15	2019/04/16			2019/04/16 12:45		
COC Number		707748-04-01	707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	SW13 DEPTH	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L						<2.0	2.0	6076746
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
Dissolved Phosphorus (P)	ug/L						<100	100	6076746
Total Phosphorus (P)	ug/L	<100	<100	<100	100	6076607			
Dissolved Potassium (K)	ug/L						290	100	6076746
Total Potassium (K)	ug/L	300	290	<100	100	6076607			
Dissolved Selenium (Se)	ug/L						<1.0	1.0	6076746
Total Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	6076607			
Dissolved Silver (Ag)	ug/L						<0.10	0.10	6076746
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	0.10	6076607			
Dissolved Sodium (Na)	ug/L						2500	100	6076746
Total Sodium (Na)	ug/L	2500	2500	<100	100	6076607			
Dissolved Strontium (Sr)	ug/L						4.1	2.0	6076746
Total Strontium (Sr)	ug/L	4.3	4.2	<2.0	2.0	6076607			
Dissolved Thallium (Tl)	ug/L						<0.10	0.10	6076746
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	0.10	6076607			
Dissolved Tin (Sn)	ug/L						<2.0	2.0	6076746
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
Dissolved Titanium (Ti)	ug/L						<2.0	2.0	6076746
Total Titanium (Ti)	ug/L	2.2	2.4	<2.0	2.0	6076607			
Dissolved Uranium (U)	ug/L						<0.10	0.10	6076746
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	0.10	6076607			
Dissolved Vanadium (V)	ug/L						<2.0	2.0	6076746
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
Dissolved Zirconium (Zr)	ug/L						<2.0	2.0	6076746
Total Zirconium (Zr)	ug/L	<2.0	<2.0	<2.0	2.0	6076607			
Dissolved Zinc (Zn)	ug/L						<5.0	5.0	6076746
Total Zinc (Zn)	ug/L	<5.0	5.9	<5.0	5.0	6076607			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JLV490	JLV491			JLV492		
Sampling Date		2019/04/16 13:15	2019/04/16			2019/04/16		
COC Number		707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 DEPTH FF	FIELD/FILTER BLANK FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	140	<5.0	5.0	6076746			
Total Aluminum (Al)	ug/L					<5.0	5.0	6076607
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	1.0	6076746			
Total Antimony (Sb)	ug/L					<1.0	1.0	6076607
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	1.0	6076746			
Total Arsenic (As)	ug/L					<1.0	1.0	6076607
Dissolved Barium (Ba)	ug/L	3.4	<1.0	1.0	6076746			
Total Barium (Ba)	ug/L					<1.0	1.0	6076607
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	1.0	6076746			
Total Beryllium (Be)	ug/L					<1.0	1.0	6076607
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	6076746			
Total Bismuth (Bi)	ug/L					<2.0	2.0	6076607
Dissolved Boron (B)	ug/L	<50	<50	50	6076746			
Total Boron (B)	ug/L					<50	50	6076607
Dissolved Cadmium (Cd)	ug/L	0.017	<0.010	0.010	6076746			
Total Cadmium (Cd)	ug/L					<0.010	0.010	6076607
Dissolved Calcium (Ca)	ug/L	750	<100	100	6076746			
Total Calcium (Ca)	ug/L					<100	100	6076607
Dissolved Chromium (Cr)	ug/L	<1.0	1.3	1.0	6076746			
Total Chromium (Cr)	ug/L					<1.0	1.0	6076607
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	0.40	6076746			
Total Cobalt (Co)	ug/L					<0.40	0.40	6076607
Dissolved Copper (Cu)	ug/L	<0.50	<0.50	0.50	6076746			
Total Copper (Cu)	ug/L					<0.50	0.50	6076607
Dissolved Iron (Fe)	ug/L	130	<50	50	6076746			
Total Iron (Fe)	ug/L					<50	50	6076607
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	6076746			
Total Lead (Pb)	ug/L					<0.50	0.50	6076607
Dissolved Magnesium (Mg)	ug/L	280	<100	100	6076746			
Total Magnesium (Mg)	ug/L					<100	100	6076607
Dissolved Manganese (Mn)	ug/L	64	<2.0	2.0	6076746			
Total Manganese (Mn)	ug/L					<2.0	2.0	6076607
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	6076746			
Total Molybdenum (Mo)	ug/L					<2.0	2.0	6076607
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JLV490	JLV491			JLV492		
Sampling Date		2019/04/16 13:15	2019/04/16			2019/04/16		
COC Number		707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 DEPTH FF	FIELD/FILTER BLANK FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	2.0	6076746			
Total Nickel (Ni)	ug/L					<2.0	2.0	6076607
Dissolved Phosphorus (P)	ug/L	<100	<100	100	6076746			
Total Phosphorus (P)	ug/L					<100	100	6076607
Dissolved Potassium (K)	ug/L	310	<100	100	6076746			
Total Potassium (K)	ug/L					<100	100	6076607
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	1.0	6076746			
Total Selenium (Se)	ug/L					<1.0	1.0	6076607
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	6076746			
Total Silver (Ag)	ug/L					<0.10	0.10	6076607
Dissolved Sodium (Na)	ug/L	2500	450	100	6076746			
Total Sodium (Na)	ug/L					<100	100	6076607
Dissolved Strontium (Sr)	ug/L	4.3	<2.0	2.0	6076746			
Total Strontium (Sr)	ug/L					<2.0	2.0	6076607
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	0.10	6076746			
Total Thallium (Tl)	ug/L					<0.10	0.10	6076607
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	2.0	6076746			
Total Tin (Sn)	ug/L					<2.0	2.0	6076607
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	2.0	6076746			
Total Titanium (Ti)	ug/L					<2.0	2.0	6076607
Dissolved Uranium (U)	ug/L	<0.10	<0.10	0.10	6076746			
Total Uranium (U)	ug/L					<0.10	0.10	6076607
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	2.0	6076746			
Total Vanadium (V)	ug/L					<2.0	2.0	6076607
Dissolved Zirconium (Zr)	ug/L	<2.0	<2.0	2.0	6076746			
Total Zirconium (Zr)	ug/L					<2.0	2.0	6076607
Dissolved Zinc (Zn)	ug/L	6.7	<5.0	5.0	6076746			
Total Zinc (Zn)	ug/L					<5.0	5.0	6076607

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JLV486	JLV487	JLV488			JLV489		
Sampling Date		2019/04/16 12:45	2019/04/16 13:15	2019/04/16			2019/04/16 12:45		
COC Number		707748-04-01	707748-04-01	707748-04-01			707748-04-01		
	UNITS	SW13 SURFACE	SW13 DEPTH	FIELD/FILTER BLANK	RDL	QC Batch	SW13 SURFACE FF	RDL	QC Batch
Metals									
Dissolved Tungsten (W)	ug/L						<1.0	1.0	6077363
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	1.0	6090012			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam ID		JLV490	JLV491		
Sampling Date		2019/04/16 13:15	2019/04/16		
COC Number		707748-04-01	707748-04-01		
	UNITS	SW13 DEPTH FF	FIELD/FILTER BLANK FF	RDL	QC Batch
Metals					
Dissolved Tungsten (W)	ug/L	<1.0	<1.0	1.0	6077363
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.3°C
Package 2	2.7°C

Note: Chlorophyll A results have some negative values reported. As per Dalhousie University: The negative value arises because the sample contains something that quenches the residual signal inherent in a blank. If the client is using it to correct field data, the negative value is the appropriate one to use.

Sample JLV486 [SW13 SURFACE] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JLV487 [SW13 DEPTH] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JLV489 [SW13 SURFACE FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JLV490 [SW13 DEPTH FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JLV491 [FIELD/FILTER BLANK FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6074612	HM2	Matrix Spike	Total Organic Carbon (C)	2019/04/18		92	%	85 - 115
6074612	HM2	Spiked Blank	Total Organic Carbon (C)	2019/04/18		100	%	80 - 120
6074612	HM2	Method Blank	Total Organic Carbon (C)	2019/04/18	<0.50		mg/L	
6074612	HM2	RPD	Total Organic Carbon (C)	2019/04/18	NC		%	15
6076499	NHU	QC Standard	pH	2019/04/18		100	%	97 - 103
6076499	NHU	RPD	pH	2019/04/18	0.16		%	N/A
6076504	NHU	Spiked Blank	Conductivity	2019/04/18		103	%	80 - 120
6076504	NHU	Method Blank	Conductivity	2019/04/18	1.6, RDL=1.0		uS/cm	
6076504	NHU	RPD	Conductivity	2019/04/18	1.1		%	10
6076584	HM2	Matrix Spike	Total Organic Carbon (C)	2019/04/22		NC	%	85 - 115
6076584	HM2	Spiked Blank	Total Organic Carbon (C)	2019/04/22		98	%	80 - 120
6076584	HM2	Method Blank	Total Organic Carbon (C)	2019/04/22	<0.50		mg/L	
6076584	HM2	RPD	Total Organic Carbon (C)	2019/04/22	0.39 (1)		%	15
6076586	HM2	Matrix Spike [JLV491-07]	Dissolved Organic Carbon (C)	2019/04/22		98	%	85 - 115
6076586	HM2	Spiked Blank	Dissolved Organic Carbon (C)	2019/04/22		97	%	80 - 120
6076586	HM2	Method Blank	Dissolved Organic Carbon (C)	2019/04/22	<0.5		mg/L	
6076586	HM2	RPD [JLV491-07]	Dissolved Organic Carbon (C)	2019/04/22	NC		%	15
6076607	BAN	Matrix Spike	Total Aluminum (Al)	2019/04/22		100	%	80 - 120
			Total Antimony (Sb)	2019/04/22		100	%	80 - 120
			Total Arsenic (As)	2019/04/22		98	%	80 - 120
			Total Barium (Ba)	2019/04/22		92	%	80 - 120
			Total Beryllium (Be)	2019/04/22		102	%	80 - 120
			Total Bismuth (Bi)	2019/04/22		99	%	80 - 120
			Total Boron (B)	2019/04/22		108	%	80 - 120
			Total Cadmium (Cd)	2019/04/22		99	%	80 - 120
			Total Calcium (Ca)	2019/04/22		NC	%	80 - 120
			Total Chromium (Cr)	2019/04/22		95	%	80 - 120
			Total Cobalt (Co)	2019/04/22		99	%	80 - 120
			Total Copper (Cu)	2019/04/22		95	%	80 - 120
			Total Iron (Fe)	2019/04/22		102	%	80 - 120
			Total Lead (Pb)	2019/04/22		97	%	80 - 120
			Total Magnesium (Mg)	2019/04/22		NC	%	80 - 120
			Total Manganese (Mn)	2019/04/22		98	%	80 - 120
			Total Molybdenum (Mo)	2019/04/22		106	%	80 - 120
			Total Nickel (Ni)	2019/04/22		98	%	80 - 120
			Total Phosphorus (P)	2019/04/22		103	%	80 - 120
			Total Potassium (K)	2019/04/22		100	%	80 - 120
			Total Selenium (Se)	2019/04/22		101	%	80 - 120
			Total Silver (Ag)	2019/04/22		98	%	80 - 120
			Total Sodium (Na)	2019/04/22		97	%	80 - 120
			Total Strontium (Sr)	2019/04/22		NC	%	80 - 120
			Total Thallium (Tl)	2019/04/22		100	%	80 - 120
			Total Tin (Sn)	2019/04/22		101	%	80 - 120
			Total Titanium (Ti)	2019/04/22		97	%	80 - 120
			Total Uranium (U)	2019/04/22		104	%	80 - 120
			Total Vanadium (V)	2019/04/22		98	%	80 - 120
			Total Zirconium (Zr)	2019/04/22		107	%	80 - 120
			Total Zinc (Zn)	2019/04/22		95	%	80 - 120
6076607	BAN	Spiked Blank	Total Aluminum (Al)	2019/04/22		101	%	80 - 120
			Total Antimony (Sb)	2019/04/22		97	%	80 - 120
			Total Arsenic (As)	2019/04/22		97	%	80 - 120
			Total Barium (Ba)	2019/04/22		95	%	80 - 120
			Total Beryllium (Be)	2019/04/22		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2019/04/22		101	%	80 - 120
			Total Boron (B)	2019/04/22		105	%	80 - 120
			Total Cadmium (Cd)	2019/04/22		97	%	80 - 120
			Total Calcium (Ca)	2019/04/22		101	%	80 - 120
			Total Chromium (Cr)	2019/04/22		95	%	80 - 120
			Total Cobalt (Co)	2019/04/22		100	%	80 - 120
			Total Copper (Cu)	2019/04/22		99	%	80 - 120
			Total Iron (Fe)	2019/04/22		105	%	80 - 120
			Total Lead (Pb)	2019/04/22		98	%	80 - 120
			Total Magnesium (Mg)	2019/04/22		105	%	80 - 120
			Total Manganese (Mn)	2019/04/22		96	%	80 - 120
			Total Molybdenum (Mo)	2019/04/22		101	%	80 - 120
			Total Nickel (Ni)	2019/04/22		97	%	80 - 120
			Total Phosphorus (P)	2019/04/22		104	%	80 - 120
			Total Potassium (K)	2019/04/22		98	%	80 - 120
			Total Selenium (Se)	2019/04/22		97	%	80 - 120
			Total Silver (Ag)	2019/04/22		95	%	80 - 120
			Total Sodium (Na)	2019/04/22		100	%	80 - 120
			Total Strontium (Sr)	2019/04/22		96	%	80 - 120
			Total Thallium (Tl)	2019/04/22		100	%	80 - 120
			Total Tin (Sn)	2019/04/22		96	%	80 - 120
			Total Titanium (Ti)	2019/04/22		95	%	80 - 120
			Total Uranium (U)	2019/04/22		105	%	80 - 120
			Total Vanadium (V)	2019/04/22		98	%	80 - 120
			Total Zirconium (Zr)	2019/04/22		105	%	80 - 120
			Total Zinc (Zn)	2019/04/22		98	%	80 - 120
6076607	BAN	Method Blank	Total Aluminum (Al)	2019/04/22	<5.0		ug/L	
			Total Antimony (Sb)	2019/04/22	<1.0		ug/L	
			Total Arsenic (As)	2019/04/22	<1.0		ug/L	
			Total Barium (Ba)	2019/04/22	<1.0		ug/L	
			Total Beryllium (Be)	2019/04/22	<1.0		ug/L	
			Total Bismuth (Bi)	2019/04/22	<2.0		ug/L	
			Total Boron (B)	2019/04/22	<50		ug/L	
			Total Cadmium (Cd)	2019/04/22	<0.010		ug/L	
			Total Calcium (Ca)	2019/04/22	<100		ug/L	
			Total Chromium (Cr)	2019/04/22	<1.0		ug/L	
			Total Cobalt (Co)	2019/04/22	<0.40		ug/L	
			Total Copper (Cu)	2019/04/22	<0.50		ug/L	
			Total Iron (Fe)	2019/04/22	<50		ug/L	
			Total Lead (Pb)	2019/04/22	<0.50		ug/L	
			Total Magnesium (Mg)	2019/04/22	<100		ug/L	
			Total Manganese (Mn)	2019/04/22	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/04/22	<2.0		ug/L	
			Total Nickel (Ni)	2019/04/22	<2.0		ug/L	
			Total Phosphorus (P)	2019/04/22	<100		ug/L	
			Total Potassium (K)	2019/04/22	<100		ug/L	
			Total Selenium (Se)	2019/04/22	<1.0		ug/L	
			Total Silver (Ag)	2019/04/22	<0.10		ug/L	
			Total Sodium (Na)	2019/04/22	<100		ug/L	
			Total Strontium (Sr)	2019/04/22	<2.0		ug/L	
			Total Thallium (Tl)	2019/04/22	<0.10		ug/L	
			Total Tin (Sn)	2019/04/22	<2.0		ug/L	
			Total Titanium (Ti)	2019/04/22	<2.0		ug/L	
			Total Uranium (U)	2019/04/22	<0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Vanadium (V)	2019/04/22	<2.0		ug/L	
			Total Zirconium (Zr)	2019/04/22	<2.0		ug/L	
			Total Zinc (Zn)	2019/04/22	<5.0		ug/L	
6076607	BAN	RPD	Total Arsenic (As)	2019/04/22	6.0		%	20
6076609	NHU	QC Standard	Turbidity	2019/04/18		101	%	80 - 120
6076609	NHU	Spiked Blank	Turbidity	2019/04/18		98	%	80 - 120
6076609	NHU	Method Blank	Turbidity	2019/04/18	<0.10		NTU	
6076609	NHU	RPD	Turbidity	2019/04/18	NC		%	20
6076631	CCR	Matrix Spike	Total Mercury (Hg)	2019/04/22		106	%	80 - 120
6076631	CCR	Spiked Blank	Total Mercury (Hg)	2019/04/22		103	%	80 - 120
6076631	CCR	Method Blank	Total Mercury (Hg)	2019/04/22	<0.013		ug/L	
6076631	CCR	RPD	Total Mercury (Hg)	2019/04/22	NC		%	20
6076633	CCR	Matrix Spike	Dissolved Mercury (Hg)	2019/04/22		104	%	80 - 120
6076633	CCR	Spiked Blank	Dissolved Mercury (Hg)	2019/04/22		107	%	80 - 120
6076633	CCR	Method Blank	Dissolved Mercury (Hg)	2019/04/22	<0.013		ug/L	
6076633	CCR	RPD	Dissolved Mercury (Hg)	2019/04/22	NC		%	20
6076646	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/04/18		97	%	80 - 120
6076646	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/04/18		104	%	80 - 120
6076646	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/04/18	<5.0		mg/L	
6076646	NRG	RPD	Total Alkalinity (Total as CaCO3)	2019/04/18	18		%	25
6076647	NRG	Matrix Spike	Dissolved Chloride (Cl-)	2019/04/22		NC	%	80 - 120
6076647	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/22		107	%	80 - 120
6076647	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/22		102	%	80 - 120
6076647	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/22	<1.0		mg/L	
6076647	NRG	RPD	Dissolved Chloride (Cl-)	2019/04/22	0.71		%	25
6076648	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2019/04/18		93	%	80 - 120
6076648	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/18		96	%	80 - 120
6076648	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/18	<2.0		mg/L	
6076648	NRG	RPD	Dissolved Sulphate (SO4)	2019/04/18	1.6		%	25
6076649	NRG	Matrix Spike	Reactive Silica (SiO2)	2019/04/22		97	%	80 - 120
6076649	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/04/22		101	%	80 - 120
6076649	NRG	Method Blank	Reactive Silica (SiO2)	2019/04/22	<0.50		mg/L	
6076649	NRG	RPD	Reactive Silica (SiO2)	2019/04/22	0.10		%	25
6076650	NRG	Spiked Blank	Colour	2019/04/22		105	%	80 - 120
6076650	NRG	Method Blank	Colour	2019/04/22	<5.0		TCU	
6076650	NRG	RPD	Colour	2019/04/22	NC		%	20
6076651	NRG	Matrix Spike	Orthophosphate (P)	2019/04/18		88	%	80 - 120
6076651	NRG	Spiked Blank	Orthophosphate (P)	2019/04/18		94	%	80 - 120
6076651	NRG	Method Blank	Orthophosphate (P)	2019/04/18	<0.010		mg/L	
6076651	NRG	RPD	Orthophosphate (P)	2019/04/18	NC		%	25
6076652	NRG	Matrix Spike	Nitrate + Nitrite (N)	2019/04/22		93	%	80 - 120
6076652	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/04/22		96	%	80 - 120
6076652	NRG	Method Blank	Nitrate + Nitrite (N)	2019/04/22	<0.050		mg/L	
6076652	NRG	RPD	Nitrate + Nitrite (N)	2019/04/22	NC		%	25
6076653	NRG	Matrix Spike	Nitrite (N)	2019/04/18		93	%	80 - 120
6076653	NRG	Spiked Blank	Nitrite (N)	2019/04/18		99	%	80 - 120
6076653	NRG	Method Blank	Nitrite (N)	2019/04/18	<0.010		mg/L	
6076653	NRG	RPD	Nitrite (N)	2019/04/18	NC		%	20
6076654	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/04/18		99	%	80 - 120
6076654	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/04/18		106	%	80 - 120
6076654	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/04/18	<5.0		mg/L	
6076654	NRG	RPD	Total Alkalinity (Total as CaCO3)	2019/04/18	5.9		%	25
6076656	NRG	Matrix Spike	Dissolved Chloride (Cl-)	2019/04/22		100	%	80 - 120
6076656	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/22		107	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6076656	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/22		100	%	80 - 120
6076656	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/22	<1.0		mg/L	
6076656	NRG	RPD	Dissolved Chloride (Cl-)	2019/04/22	1.6		%	25
6076657	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2019/04/18		97	%	80 - 120
6076657	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/18		94	%	80 - 120
6076657	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/18	<2.0		mg/L	
6076657	NRG	RPD	Dissolved Sulphate (SO4)	2019/04/18	NC		%	25
6076660	NRG	Matrix Spike	Reactive Silica (SiO2)	2019/04/22		97	%	80 - 120
6076660	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/04/22		99	%	80 - 120
6076660	NRG	Method Blank	Reactive Silica (SiO2)	2019/04/22	<0.50		mg/L	
6076660	NRG	RPD	Reactive Silica (SiO2)	2019/04/22	0.83		%	25
6076661	NRG	Spiked Blank	Colour	2019/04/22		102	%	80 - 120
6076661	NRG	Method Blank	Colour	2019/04/22	<5.0		TCU	
6076661	NRG	RPD	Colour	2019/04/22	1.3		%	20
6076663	NRG	Matrix Spike	Orthophosphate (P)	2019/04/18		88	%	80 - 120
6076663	NRG	Spiked Blank	Orthophosphate (P)	2019/04/18		92	%	80 - 120
6076663	NRG	Method Blank	Orthophosphate (P)	2019/04/18	<0.010		mg/L	
6076663	NRG	RPD	Orthophosphate (P)	2019/04/18	NC		%	25
6076664	NRG	Matrix Spike	Nitrate + Nitrite (N)	2019/04/22		92	%	80 - 120
6076664	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/04/22		89	%	80 - 120
6076664	NRG	Method Blank	Nitrate + Nitrite (N)	2019/04/22	<0.050		mg/L	
6076664	NRG	RPD	Nitrate + Nitrite (N)	2019/04/22	20		%	25
6076665	NRG	Matrix Spike	Nitrite (N)	2019/04/18		94	%	80 - 120
6076665	NRG	Spiked Blank	Nitrite (N)	2019/04/18		87	%	80 - 120
6076665	NRG	Method Blank	Nitrite (N)	2019/04/18	<0.010		mg/L	
6076665	NRG	RPD	Nitrite (N)	2019/04/18	NC		%	20
6076746	BAN	Matrix Spike	Dissolved Aluminum (Al)	2019/04/22		103	%	80 - 120
			Dissolved Antimony (Sb)	2019/04/22		97	%	80 - 120
			Dissolved Arsenic (As)	2019/04/22		97	%	80 - 120
			Dissolved Barium (Ba)	2019/04/22		95	%	80 - 120
			Dissolved Beryllium (Be)	2019/04/22		100	%	80 - 120
			Dissolved Bismuth (Bi)	2019/04/22		97	%	80 - 120
			Dissolved Boron (B)	2019/04/22		103	%	80 - 120
			Dissolved Cadmium (Cd)	2019/04/22		99	%	80 - 120
			Dissolved Calcium (Ca)	2019/04/22		NC	%	80 - 120
			Dissolved Chromium (Cr)	2019/04/22		94	%	80 - 120
			Dissolved Cobalt (Co)	2019/04/22		97	%	80 - 120
			Dissolved Copper (Cu)	2019/04/22		95	%	80 - 120
			Dissolved Iron (Fe)	2019/04/22		101	%	80 - 120
			Dissolved Lead (Pb)	2019/04/22		97	%	80 - 120
			Dissolved Magnesium (Mg)	2019/04/22		96	%	80 - 120
			Dissolved Manganese (Mn)	2019/04/22		92	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/04/22		103	%	80 - 120
			Dissolved Nickel (Ni)	2019/04/22		95	%	80 - 120
			Dissolved Phosphorus (P)	2019/04/22		104	%	80 - 120
			Dissolved Potassium (K)	2019/04/22		102	%	80 - 120
			Dissolved Selenium (Se)	2019/04/22		100	%	80 - 120
			Dissolved Silver (Ag)	2019/04/22		97	%	80 - 120
			Dissolved Sodium (Na)	2019/04/22		NC	%	80 - 120
			Dissolved Strontium (Sr)	2019/04/22		NC	%	80 - 120
			Dissolved Thallium (Tl)	2019/04/22		100	%	80 - 120
			Dissolved Tin (Sn)	2019/04/22		103	%	80 - 120
			Dissolved Titanium (Ti)	2019/04/22		98	%	80 - 120
			Dissolved Uranium (U)	2019/04/22		105	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6076746	BAN	Spiked Blank	Dissolved Vanadium (V)	2019/04/22		98	%	80 - 120
				Dissolved Zinc (Zn)	2019/04/22		95	%	80 - 120
				Dissolved Aluminum (Al)	2019/04/22		100	%	80 - 120
				Dissolved Antimony (Sb)	2019/04/22		94	%	80 - 120
				Dissolved Arsenic (As)	2019/04/22		94	%	80 - 120
				Dissolved Barium (Ba)	2019/04/22		95	%	80 - 120
				Dissolved Beryllium (Be)	2019/04/22		96	%	80 - 120
				Dissolved Bismuth (Bi)	2019/04/22		100	%	80 - 120
				Dissolved Boron (B)	2019/04/22		101	%	80 - 120
				Dissolved Cadmium (Cd)	2019/04/22		98	%	80 - 120
				Dissolved Calcium (Ca)	2019/04/22		101	%	80 - 120
				Dissolved Chromium (Cr)	2019/04/22		95	%	80 - 120
				Dissolved Cobalt (Co)	2019/04/22		99	%	80 - 120
				Dissolved Copper (Cu)	2019/04/22		98	%	80 - 120
				Dissolved Iron (Fe)	2019/04/22		103	%	80 - 120
				Dissolved Lead (Pb)	2019/04/22		98	%	80 - 120
				Dissolved Magnesium (Mg)	2019/04/22		105	%	80 - 120
				Dissolved Manganese (Mn)	2019/04/22		96	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/04/22		100	%	80 - 120
				Dissolved Nickel (Ni)	2019/04/22		99	%	80 - 120
				Dissolved Phosphorus (P)	2019/04/22		103	%	80 - 120
				Dissolved Potassium (K)	2019/04/22		99	%	80 - 120
				Dissolved Selenium (Se)	2019/04/22		98	%	80 - 120
				Dissolved Silver (Ag)	2019/04/22		94	%	80 - 120
				Dissolved Sodium (Na)	2019/04/22		99	%	80 - 120
				Dissolved Strontium (Sr)	2019/04/22		96	%	80 - 120
				Dissolved Thallium (Tl)	2019/04/22		101	%	80 - 120
				Dissolved Tin (Sn)	2019/04/22		99	%	80 - 120
				Dissolved Titanium (Ti)	2019/04/22		99	%	80 - 120
				Dissolved Uranium (U)	2019/04/22		104	%	80 - 120
				Dissolved Vanadium (V)	2019/04/22		97	%	80 - 120
				Dissolved Zirconium (Zr)	2019/04/22		110	%	80 - 120
				Dissolved Zinc (Zn)	2019/04/22		97	%	80 - 120
	6076746	BAN	Method Blank	Dissolved Aluminum (Al)	2019/04/22	<5.0		ug/L	
				Dissolved Antimony (Sb)	2019/04/22	<1.0		ug/L	
				Dissolved Arsenic (As)	2019/04/22	<1.0		ug/L	
				Dissolved Barium (Ba)	2019/04/22	<1.0		ug/L	
				Dissolved Beryllium (Be)	2019/04/22	<1.0		ug/L	
				Dissolved Bismuth (Bi)	2019/04/22	<2.0		ug/L	
				Dissolved Boron (B)	2019/04/22	<50		ug/L	
				Dissolved Cadmium (Cd)	2019/04/22	<0.010		ug/L	
				Dissolved Calcium (Ca)	2019/04/22	<100		ug/L	
				Dissolved Chromium (Cr)	2019/04/22	<1.0		ug/L	
				Dissolved Cobalt (Co)	2019/04/22	<0.40		ug/L	
				Dissolved Copper (Cu)	2019/04/22	<0.50		ug/L	
				Dissolved Iron (Fe)	2019/04/22	<50		ug/L	
				Dissolved Lead (Pb)	2019/04/22	<0.50		ug/L	
				Dissolved Magnesium (Mg)	2019/04/22	<100		ug/L	
				Dissolved Manganese (Mn)	2019/04/22	<2.0		ug/L	
				Dissolved Molybdenum (Mo)	2019/04/22	<2.0		ug/L	
				Dissolved Nickel (Ni)	2019/04/22	<2.0		ug/L	
				Dissolved Phosphorus (P)	2019/04/22	<100		ug/L	
				Dissolved Potassium (K)	2019/04/22	<100		ug/L	
				Dissolved Selenium (Se)	2019/04/22	<1.0		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2019/04/22	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/04/22	<100		ug/L	
			Dissolved Strontium (Sr)	2019/04/22	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/04/22	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/04/22	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/04/22	<2.0		ug/L	
			Dissolved Uranium (U)	2019/04/22	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/04/22	<2.0		ug/L	
			Dissolved Zirconium (Zr)	2019/04/22	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/04/22	<5.0		ug/L	
6076746	BAN	RPD	Dissolved Aluminum (Al)	2019/04/18	6.9		%	20
			Dissolved Antimony (Sb)	2019/04/18	NC		%	20
			Dissolved Arsenic (As)	2019/04/18	NC		%	20
			Dissolved Barium (Ba)	2019/04/18	0.75		%	20
			Dissolved Beryllium (Be)	2019/04/18	NC		%	20
			Dissolved Bismuth (Bi)	2019/04/18	NC		%	20
			Dissolved Boron (B)	2019/04/18	NC		%	20
			Dissolved Cadmium (Cd)	2019/04/18	NC		%	20
			Dissolved Calcium (Ca)	2019/04/18	0.96		%	20
			Dissolved Chromium (Cr)	2019/04/18	4.0		%	20
			Dissolved Cobalt (Co)	2019/04/18	NC		%	20
			Dissolved Copper (Cu)	2019/04/18	NC		%	20
			Dissolved Iron (Fe)	2019/04/18	NC		%	20
			Dissolved Lead (Pb)	2019/04/18	NC		%	20
			Dissolved Magnesium (Mg)	2019/04/18	1.8		%	20
			Dissolved Manganese (Mn)	2019/04/18	3.3		%	20
			Dissolved Molybdenum (Mo)	2019/04/18	NC		%	20
			Dissolved Nickel (Ni)	2019/04/18	NC		%	20
			Dissolved Phosphorus (P)	2019/04/18	NC		%	20
			Dissolved Potassium (K)	2019/04/18	1.1		%	20
			Dissolved Selenium (Se)	2019/04/18	NC		%	20
			Dissolved Silver (Ag)	2019/04/18	NC		%	20
			Dissolved Sodium (Na)	2019/04/18	0.66		%	20
			Dissolved Strontium (Sr)	2019/04/18	1.3		%	20
			Dissolved Thallium (Tl)	2019/04/18	NC		%	20
			Dissolved Tin (Sn)	2019/04/18	NC		%	20
			Dissolved Titanium (Ti)	2019/04/18	NC		%	20
			Dissolved Uranium (U)	2019/04/18	1.1		%	20
			Dissolved Vanadium (V)	2019/04/18	NC		%	20
			Dissolved Zinc (Zn)	2019/04/18	NC		%	20
6076775	AM6	QC Standard	Total Suspended Solids	2019/04/25		97	%	80 - 120
6076775	AM6	Method Blank	Total Suspended Solids	2019/04/25	<1.0		mg/L	
6076775	AM6	RPD	Total Suspended Solids	2019/04/25	7.4		%	20
6077363	ADA	Matrix Spike	Dissolved Tungsten (W)	2019/04/22		103	%	80 - 120
6077363	ADA	Spiked Blank	Dissolved Tungsten (W)	2019/04/22		101	%	80 - 120
6077363	ADA	Method Blank	Dissolved Tungsten (W)	2019/04/22	<1.0		ug/L	
6077820	SHC	Spiked Blank	Radium-226	2019/05/03		105	%	85 - 115
6077820	SHC	Method Blank	Radium-226	2019/05/03	<0.010		Bq/L	
6077820	SHC	RPD	Radium-226	2019/05/03	NC		%	N/A
6080170	NRG	Matrix Spike	Total Phosphorus	2019/04/23		107	%	80 - 120
6080170	NRG	Spiked Blank	Total Phosphorus	2019/04/23		91	%	80 - 120
6080170	NRG	Method Blank	Total Phosphorus	2019/04/23	<0.020		mg/L	
6080170	NRG	RPD	Total Phosphorus	2019/04/23	2.9		%	25
6080174	NHU	QC Standard	pH	2019/04/22		101	%	97 - 103

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6080174	NHU	RPD	pH	2019/04/22	3.4		%	N/A
6080177	NHU	Spiked Blank	Conductivity	2019/04/22		103	%	80 - 120
6080177	NHU	Method Blank	Conductivity	2019/04/22	<1.0		uS/cm	
6080177	NHU	RPD	Conductivity	2019/04/22	NC		%	10
6080178	NHU	Matrix Spike	Dissolved Fluoride (F-)	2019/04/22		NC	%	80 - 120
6080178	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/04/22		100	%	80 - 120
6080178	NHU	Method Blank	Dissolved Fluoride (F-)	2019/04/22	<0.10		mg/L	
6080178	NHU	RPD	Dissolved Fluoride (F-)	2019/04/22	NC		%	20
6080273	KMC	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/22		96	%	N/A
6080273	KMC	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/22		97	%	80 - 120
6080273	KMC	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/22	<0.050		mg/L	
6080273	KMC	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/22	NC		%	20
6080296	EBR	Matrix Spike [JLV486-13]	Total Chemical Oxygen Demand	2019/04/22		102	%	80 - 120
6080296	EBR	QC Standard	Total Chemical Oxygen Demand	2019/04/22		97	%	80 - 120
6080296	EBR	Spiked Blank	Total Chemical Oxygen Demand	2019/04/22		99	%	80 - 120
6080296	EBR	Method Blank	Total Chemical Oxygen Demand	2019/04/22	<20		mg/L	
6080296	EBR	RPD [JLV486-13]	Total Chemical Oxygen Demand	2019/04/22	NC		%	25
6082128	KMC	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/23		NC	%	80 - 120
6082128	KMC	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/23		103	%	80 - 120
6082128	KMC	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/23	<0.050		mg/L	
6082128	KMC	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/23	3.4		%	20
6082237	BBD	Matrix Spike	Acidity	2019/04/23		98	%	80 - 120
6082237	BBD	Spiked Blank	Acidity	2019/04/23		103	%	80 - 120
6082237	BBD	Method Blank	Acidity	2019/04/23	<5.0		mg/L	
6082237	BBD	RPD	Acidity	2019/04/23	NC		%	25
6082581	XQI	Matrix Spike	Total Cyanide (CN)	2019/04/23		98	%	80 - 120
6082581	XQI	Spiked Blank	Total Cyanide (CN)	2019/04/23		104	%	80 - 120
6082581	XQI	Method Blank	Total Cyanide (CN)	2019/04/23	<0.0050		mg/L	
6082581	XQI	RPD	Total Cyanide (CN)	2019/04/23	NC		%	20
6082648	BBD	QC Standard	Salinity	2019/04/23		100	%	80 - 120
6082648	BBD	Method Blank	Salinity	2019/04/23	<2.0		N/A	
6082648	BBD	RPD	Salinity	2019/04/23	NC		%	25
6084939	AM6	QC Standard	Total Dissolved Solids	2019/04/25		94	%	80 - 120
6084939	AM6	Method Blank	Total Dissolved Solids	2019/04/25	<10		mg/L	
6084939	AM6	RPD	Total Dissolved Solids	2019/04/25	0.79		%	25
6087552	GGC	Spiked Blank	WAD Cyanide (Free)	2019/04/24		95	%	80 - 120
6087552	GGC	Method Blank	WAD Cyanide (Free)	2019/04/24	<0.0030		mg/L	
6087760	GGC	Spiked Blank	WAD Cyanide (Free)	2019/04/24		97	%	80 - 120
6087760	GGC	Method Blank	WAD Cyanide (Free)	2019/04/24	<0.0030		mg/L	
6090012	ADA	Matrix Spike	Total Tungsten (W)	2019/04/26		106	%	80 - 120
6090012	ADA	Spiked Blank	Total Tungsten (W)	2019/04/26		104	%	80 - 120
6090012	ADA	Method Blank	Total Tungsten (W)	2019/04/26	<1.0		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6090012	ADA	RPD	Total Tungsten (W)	2019/04/26	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>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)</p> <p>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 $\leq 2x$ RDL).</p> <p>(1) Elevated reporting limit due to turbidity.</p>									

VALIDATION SIGNATURE PAGE



The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).




Miryam Assayag



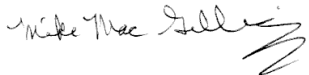
Eric Dearman, Scientific Specialist

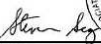
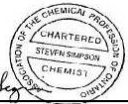
Eva Pranjic, M.Sc., C.Chem, Scientific Specialist



Gina Thompson, Inorganics General Chemistry Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)

Steven Simpson, Lab Director

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your P.O. #: 5628
 Your Project #: Fifteen Mile Stream
 Your C.O.C. #: 719798-01-01, 719798-02-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/06/26
 Report #: R5772970
 Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E9646

Received: 2019/06/03, 15:55

Sample Matrix: Water
 # Samples Received: 21

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Acidity (CaCO3) in water (5)	11	N/A	2019/06/13		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	11	N/A	2019/06/07	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	10	N/A	2019/06/10	N/A	SM 23 4500-CO2 D
Alkalinity	21	N/A	2019/06/11	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	21	N/A	2019/06/10	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	11	N/A	2019/06/06	ATL SOP 00042	SM 23 5220D m
Colour	21	N/A	2019/06/06	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	7	2019/06/07	2019/06/08	CAM SOP-00457	OMOE E3015 5 m
Total Cyanide (1)	3	2019/06/07	2019/06/10	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (6)	10	N/A	2019/06/06	ATL SOP 00203	SM 23 5310B m
Organic carbon - Diss (DOC) (as rec'd) (6)	1	N/A	2019/06/10	ATL SOP 00203	SM 23 5310B m
Conductance - water	11	N/A	2019/06/07	ATL SOP 00004	SM 23 2510B m
Conductance - water	10	N/A	2019/06/10	ATL SOP 00004	SM 23 2510B m
Fluoride	4	N/A	2019/06/07	ATL SOP 00043	SM 23 4500-F- C m
Fluoride	7	N/A	2019/06/10	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	20	N/A	2019/06/07	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	1	N/A	2019/06/10	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	10	2019/06/06	2019/06/06	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	11	2019/06/06	2019/06/06	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	9	N/A	2019/06/06	ATL SOP 00058	EPA 6020B R2 m
Metals Water Diss. MS (as rec'd)	1	N/A	2019/06/07	ATL SOP 00058	EPA 6020B R2 m
Metals Water Diss. MS (as rec'd)	1	N/A	2019/06/11	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	11	2019/06/06	2019/06/06	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	10	N/A	2019/06/07	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	10	N/A	2019/06/12	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	20	N/A	2019/06/11	N/A	Auto Calc.
Anion and Cation Sum	10	N/A	2019/06/07	N/A	Auto Calc.
Anion and Cation Sum	11	N/A	2019/06/10	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	10	2019/06/13	2019/06/16	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	8	N/A	2019/06/06	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water	13	N/A	2019/06/07	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	21	N/A	2019/06/10	ATL SOP 00016	USGS I-2547-11m



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 CANADA B4B 1G7

Report Date: 2019/06/26
 Report #: R5772970
 Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E9646

Received: 2019/06/03, 15:55

Sample Matrix: Water
 # Samples Received: 21

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Nitrogen - Nitrite	21	N/A	2019/06/10	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	21	N/A	2019/06/11	ATL SOP 00018	ASTM D3867-16
pH (7)	11	N/A	2019/06/07	ATL SOP 00003	SM 23 4500-H+ B m
pH (7)	10	N/A	2019/06/10	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	21	N/A	2019/06/11	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (3, 8)	5	N/A	2019/06/20	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Radium Isotopes by Alpha Spectrometry (3, 8)	5	N/A	2019/06/21	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (5)	11	N/A	2019/06/06		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	21	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	21	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Reactive Silica	21	N/A	2019/06/11	ATL SOP 00022	EPA 366.0 m
Sulphate	21	N/A	2019/06/10	ATL SOP 00023	ASTM D516-16 m
Methyl Mercury (sub from Bedford) (4)	10	N/A	2019/06/18		EPA 1630
Total Dissolved Solids (Filt. Residue)	11	2019/06/06	2019/06/07	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	21	N/A	2019/06/11	N/A	Auto Calc.
Organic carbon - Total (TOC) (9)	14	N/A	2019/06/06	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (9)	7	N/A	2019/06/07	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	11	2019/06/05	2019/06/06	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	11	2019/06/06	2019/06/10	ATL SOP 00007	SM 23 2540D m
Turbidity	1	N/A	2019/06/06	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	20	N/A	2019/06/07	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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



Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
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Report Date: 2019/06/26
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CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E9646

Received: 2019/06/03, 15:55

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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Laboratories Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Bureau Veritas Laboratories Kitimat
- (4) This test was performed by Sub Bedford to Flett Research
- (5) Non-accredited test method
- (6) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (7) 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.
- (8) Radium-226 results have not been corrected for blanks.
- (9) 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.

Maryann Comeau, Project Manager
Email: Maryann.COMEAU@bvlab.com
Phone# (902)420-0203 Ext:298

=====
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV274			JWV274			JWV275		
Sampling Date		2019/06/03 08:20			2019/06/03 08:20			2019/06/03 08:20		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2	RDL	QC Batch	SW 2 Lab-Dup	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.110	N/A	6156613				0.110	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606				<1.0	1.0	6156606
Calculated TDS	mg/L	8.0	1.0	6156630				8.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606				<1.0	1.0	6156606
Cation Sum	me/L	0.160	N/A	6156613				0.150	N/A	6156613
Hardness (CaCO3)	mg/L	2.3	1.0	6156609				2.3	1.0	6156609
Ion Balance (% Difference)	%	18.5	N/A	6156611				15.4	N/A	6156611
Langelier Index (@ 20C)	N/A	NC		6156626				NC		6156626
Langelier Index (@ 4C)	N/A	NC		6156628				NC		6156628
Nitrate (N)	mg/L	<0.050	0.050	6156614				<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A	NC		6156626				NC		6156626
Saturation pH (@ 4C)	N/A	NC		6156628				NC		6156628

Inorganics										
Acidity	mg/L	<5.0	5.0	6174090	<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167285				<5.0	5.0	6167297
Total Chemical Oxygen Demand	mg/L	<20	20	6161311						
Dissolved Chloride (Cl-)	mg/L	3.9	1.0	6167288				3.8	1.0	6167300
Colour	TCU	31	5.0	6159650				30	5.0	6159650
Total Dissolved Solids	mg/L	19	10	6161936						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6163989	<0.10	0.10	6163989			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167294				<0.050	0.050	6167305
Nitrite (N)	mg/L	<0.010	0.010	6167295				<0.010	0.010	6167306
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6159706				<0.050	0.050	6159706
Dissolved Organic Carbon (C)	mg/L							5.2	0.5	6161486
Total Organic Carbon (C)	mg/L	5.3	0.50	6161502				5.3	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167293				<0.010	0.010	6167304
pH	pH	6.33 (1)	N/A	6163986	5.84 (1)	N/A	6163986	5.87	N/A	6164137
Total Phosphorus	mg/L	<0.020	0.020	6158874						
Salinity	N/A	<2.0	2.0	6161198						
Reactive Silica (SiO2)	mg/L	1.1	0.50	6167291				1.1	0.50	6167303

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 (1) Poor duplicate agreement due to matrix interferences.



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV274			JWV274			JWV275		
Sampling Date		2019/06/03 08:20			2019/06/03 08:20			2019/06/03 08:20		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2	RDL	QC Batch	SW 2 Lab-Dup	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch
Total Suspended Solids	mg/L	1.8	1.0	6161340						
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167290				<2.0	2.0	6167301
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6164157						
Turbidity	NTU	1.1	0.10	6163754				0.31	0.10	6161380
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192962						
Conductivity	uS/cm	18	1.0	6163987	18	1.0	6163987	18	1.0	6164141
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572	<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6161324						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV275			JWV276			JWV277		
Sampling Date		2019/06/03 08:20			2019/06/03 09:30			2019/06/03 09:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2 (FILTERED) Lab-Dup	RDL	QC Batch	SW 3	RDL	QC Batch	SW 3 (FILTERED)	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.110	N/A	6156613	0.110	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L				9.0	1.0	6156630	9.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L				0.160	N/A	6156613	0.150	N/A	6156613
Hardness (CaCO3)	mg/L				2.3	1.0	6156609	2.2	1.0	6156609
Ion Balance (% Difference)	%				18.5	N/A	6156611	15.4	N/A	6156611
Langelier Index (@ 20C)	N/A				NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A				NC		6156628	NC		6156628
Nitrate (N)	mg/L				<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A				NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A				NC		6156628	NC		6156628

Inorganics										
Acidity	mg/L				<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167297	<5.0	5.0	6167285	<5.0	5.0	6167285
Total Chemical Oxygen Demand	mg/L				<20	20	6161311			
Dissolved Chloride (Cl-)	mg/L	3.8	1.0	6167300	4.1	1.0	6167288	4.0	1.0	6167288
Colour	TCU	31	5.0	6159650	5.9	5.0	6159650	5.8	5.0	6159650
Total Dissolved Solids	mg/L				12	10	6161936			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6164136			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167305	<0.050	0.050	6167294	<0.050	0.050	6167294
Nitrite (N)	mg/L	<0.010	0.010	6167306	<0.010	0.010	6167295	<0.010	0.010	6167295
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6159706	<0.050	0.050	6159706
Dissolved Organic Carbon (C)	mg/L							2.4	0.5	6161486
Total Organic Carbon (C)	mg/L				1.9	0.50	6161502	1.9	0.50	6163938
Orthophosphate (P)	mg/L	<0.010	0.010	6167304	<0.010	0.010	6167293	<0.010	0.010	6167293
pH	pH				6.21	N/A	6164116	6.11	N/A	6161633
Total Phosphorus	mg/L				<0.020	0.020	6158874			
Salinity	N/A				<2.0	2.0	6161198			
Reactive Silica (SiO2)	mg/L	1.2	0.50	6167303	1.8	0.50	6167291	1.7	0.50	6167291
Total Suspended Solids	mg/L				<1.0	1.0	6161340			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV275			JWV276			JWV277		
Sampling Date		2019/06/03 08:20			2019/06/03 09:30			2019/06/03 09:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2 (FILTERED) Lab-Dup	RDL	QC Batch	SW 3	RDL	QC Batch	SW 3 (FILTERED)	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167301	<2.0	2.0	6167290	<2.0	2.0	6167290
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6164168			
Turbidity	NTU	0.26	0.10	6161380	0.49	0.10	6163754	0.12	0.10	6163754
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192958			
Conductivity	uS/cm				19	1.0	6164134	18	1.0	6161639
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6161324			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV277			JWV278			JWV279		
Sampling Date		2019/06/03 09:30			2019/06/03 13:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3 (FILTERED) Lab-Dup	RDL	QC Batch	SW 6	RDL	QC Batch	SW 6 (FILTERED)	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.120	N/A	6156613	0.120	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L				10	1.0	6156630	10	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L				0.190	N/A	6156613	0.180	N/A	6156613
Hardness (CaCO3)	mg/L				2.6	1.0	6156609	2.6	1.0	6156609
Ion Balance (% Difference)	%				22.6	N/A	6156611	20.0	N/A	6156611
Langelier Index (@ 20C)	N/A				NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A				NC		6156628	NC		6156628
Nitrate (N)	mg/L				<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A				NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A				NC		6156628	NC		6156628

Inorganics										
Acidity	mg/L				<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167285	<5.0	5.0	6167285
Total Chemical Oxygen Demand	mg/L				<20	20	6161311			
Dissolved Chloride (Cl-)	mg/L				4.4	1.0	6167288	4.4	1.0	6167288
Colour	TCU				50	25	6159650	50	25	6159650
Total Dissolved Solids	mg/L				25	10	6161936			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6164136			
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6167294	<0.050	0.050	6167294
Nitrite (N)	mg/L				<0.010	0.010	6167295	<0.010	0.010	6167295
Nitrogen (Ammonia Nitrogen)	mg/L	0.059	0.050	6159706	<0.050	0.050	6159706	<0.050	0.050	6159706
Dissolved Organic Carbon (C)	mg/L							7.3	0.5	6161486
Total Organic Carbon (C)	mg/L				7.4	0.50	6161502	7.4	0.50	6161500
Orthophosphate (P)	mg/L				<0.010	0.010	6167293	<0.010	0.010	6167293
pH	pH				6.01	N/A	6164116	5.72	N/A	6161620
Total Phosphorus	mg/L				<0.020	0.020	6158874			
Salinity	N/A				<2.0	2.0	6161198			
Reactive Silica (SiO2)	mg/L				1.7	0.50	6167291	1.8	0.50	6167291
Total Suspended Solids	mg/L				1.6	1.0	6161340			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV277			JWV278			JWV279		
Sampling Date		2019/06/03 09:30			2019/06/03 13:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3 (FILTERED) Lab-Dup	RDL	QC Batch	SW 6	RDL	QC Batch	SW 6 (FILTERED)	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6167290	<2.0	2.0	6167290
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6164184			
Turbidity	NTU				0.76	0.10	6163754	0.22	0.10	6163754
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192958			
Conductivity	uS/cm				21	1.0	6164134	20	1.0	6161624
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6161324			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV280			JWV281			JWV282		
Sampling Date		2019/06/03 11:30			2019/06/03 11:30			2019/06/03 12:35		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch	SW 10	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.0900	N/A	6156613	0.0900	N/A	6156613	0.120	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L	9.0	1.0	6156630	9.0	1.0	6156630	9.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L	0.170	N/A	6156613	0.150	N/A	6156613	0.170	N/A	6156613
Hardness (CaCO3)	mg/L	2.8	1.0	6156609	2.6	1.0	6156609	2.3	1.0	6156609
Ion Balance (% Difference)	%	30.8	N/A	6156611	25.0	N/A	6156611	17.2	N/A	6156611
Langelier Index (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628
Nitrate (N)	mg/L	<0.050	0.050	6156614	<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628

Inorganics										
Acidity	mg/L	7.2	5.0	6174090				<5.0	5.0	6174090
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167285	<5.0	5.0	6167285	<5.0	5.0	6167285
Total Chemical Oxygen Demand	mg/L	32	20	6161311				<20	20	6161311
Dissolved Chloride (Cl-)	mg/L	3.2	1.0	6167288	3.2	1.0	6167288	4.1	1.0	6167288
Colour	TCU	43	5.0	6159650	42	5.0	6159650	33	5.0	6159650
Total Dissolved Solids	mg/L	22	10	6161936				19	10	6161936
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6161614				<0.10	0.10	6164136
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167294	<0.050	0.050	6167294	<0.050	0.050	6167294
Nitrite (N)	mg/L	<0.010	0.010	6167295	<0.010	0.010	6167295	<0.010	0.010	6167295
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6159706	<0.050	0.050	6159706	<0.050	0.050	6161902
Dissolved Organic Carbon (C)	mg/L				7.6	0.5	6161486			
Total Organic Carbon (C)	mg/L	7.9	0.50	6161502	8.0	0.50	6161502	5.7	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167293	<0.010	0.010	6167293	<0.010	0.010	6167293
pH	pH	5.71	N/A	6161589	5.97	N/A	6164137	6.04	N/A	6164116
Total Phosphorus	mg/L	<0.020	0.020	6158874				<0.020	0.020	6158874
Salinity	N/A	<2.0	2.0	6161198				<2.0	2.0	6161198
Reactive Silica (SiO2)	mg/L	2.2	0.50	6167291	2.2	0.50	6167291	1.7	0.50	6167291
Total Suspended Solids	mg/L	1.0	1.0	6161340				2.2	1.0	6161340
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167290	<2.0	2.0	6167290	<2.0	2.0	6167290

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



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV280			JWV281			JWV282		
Sampling Date		2019/06/03 11:30			2019/06/03 11:30			2019/06/03 12:35		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch	SW 10	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6164157				<0.0050	0.0050	6164168
Turbidity	NTU	0.46	0.10	6163754	0.23	0.10	6163754	1.5	0.10	6163756
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192962				<0.0030	0.0030	6192958
Conductivity	uS/cm	17	1.0	6161594	19	1.0	6164141	20	1.0	6164134
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572				<0.010	0.010	6170572
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6161324				ATTACHED	N/A	6161324
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV283			JWW871			JWW872		
Sampling Date		2019/06/03 12:35			2019/06/03 08:50			2019/06/03 08:50		
COC Number		719798-01-01			719798-02-01			719798-02-01		
	UNITS	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch	SW 11 (FILTERED)	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.110	N/A	6156613	0.100	N/A	6156613	0.100	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L	10	1.0	6156630	8.0	1.0	6156630	8.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L	0.160	N/A	6156613	0.140	N/A	6156613	0.140	N/A	6156613
Hardness (CaCO3)	mg/L	2.3	1.0	6156609	2.0	1.0	6156609	2.1	1.0	6156609
Ion Balance (% Difference)	%	18.5	N/A	6156611	16.7	N/A	6156611	16.7	N/A	6156611
Langelier Index (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628
Nitrate (N)	mg/L	<0.050	0.050	6156614	<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628

Inorganics										
Acidity	mg/L				5.4	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167285	<5.0	5.0	6167285	<5.0	5.0	6167285
Total Chemical Oxygen Demand	mg/L				27	20	6161311			
Dissolved Chloride (Cl-)	mg/L	4.0	1.0	6167288	3.6	1.0	6167288	3.6	1.0	6167288
Colour	TCU	32	5.0	6159650	91	25	6159650	91	25	6159650
Total Dissolved Solids	mg/L				16	10	6161936			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6164136			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167294	<0.050	0.050	6167294	<0.050	0.050	6167294
Nitrite (N)	mg/L	<0.010	0.010	6167295	<0.010	0.010	6167295	<0.010	0.010	6167295
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902	<0.050	0.050	6161902	<0.050	0.050	6161902
Dissolved Organic Carbon (C)	mg/L	5.6	0.5	6161486				9.4	0.5	6161486
Total Organic Carbon (C)	mg/L	5.4	0.50	6163938	9.4	0.50	6161502	9.3	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167293	<0.010	0.010	6167293	<0.010	0.010	6167293
pH	pH	5.67	N/A	6161620	5.69	N/A	6164116	5.76	N/A	6161620
Total Phosphorus	mg/L				<0.020	0.020	6158874			
Salinity	N/A				<2.0	2.0	6161198			
Reactive Silica (SiO2)	mg/L	1.9	0.50	6167291	1.5	0.50	6167291	1.5	0.50	6167291
Total Suspended Solids	mg/L				2.4	1.0	6161340			
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167290	<2.0	2.0	6167290	<2.0	2.0	6167290

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



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWV283			JWW871			JWW872		
Sampling Date		2019/06/03 12:35			2019/06/03 08:50			2019/06/03 08:50		
COC Number		719798-01-01			719798-02-01			719798-02-01		
	UNITS	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch	SW 11 (FILTERED)	RDL	QC Batch
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6164157			
Turbidity	NTU	0.21	0.10	6163754	1.1	0.10	6163754	0.27	0.10	6163754
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192958			
Conductivity	uS/cm	19	1.0	6161624	19	1.0	6164134	18	1.0	6161624
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6161324			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW873			JWW874			JWW875		
Sampling Date		2019/06/03 10:15			2019/06/03 10:15			2019/06/03 11:00		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch	SW 14	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.100	N/A	6156613	0.100	N/A	6156613	0.120	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L	9.0	1.0	6156630	9.0	1.0	6156630	10	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L	0.170	N/A	6156613	0.150	N/A	6156613	0.190	N/A	6156613
Hardness (CaCO3)	mg/L	2.6	1.0	6156609	2.4	1.0	6156609	2.7	1.0	6156609
Ion Balance (% Difference)	%	25.9	N/A	6156611	20.0	N/A	6156611	22.6	N/A	6156611
Langelier Index (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628
Nitrate (N)	mg/L	<0.050	0.050	6156614	<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A	NC		6156626	NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A	NC		6156628	NC		6156628	NC		6156628

Inorganics										
Acidity	mg/L	6.2	5.0	6174090				<5.0	5.0	6174090
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167285	<5.0	5.0	6167285	<5.0	5.0	6167285
Total Chemical Oxygen Demand	mg/L	37	20	6161311				29	20	6161311
Dissolved Chloride (Cl-)	mg/L	3.5	1.0	6167288	3.5	1.0	6167288	4.2	1.0	6167288
Colour	TCU	150	25	6159650	140	25	6159650	42 (1)	10	6159653
Total Dissolved Solids	mg/L	29	10	6161936				21	10	6161936
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6161614				<0.10	0.10	6164136
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167294	<0.050	0.050	6167294	<0.050	0.050	6167294
Nitrite (N)	mg/L	<0.010	0.010	6167295	<0.010	0.010	6167295	<0.010	0.010	6167295
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902	<0.050	0.050	6161902	0.052	0.050	6161902
Dissolved Organic Carbon (C)	mg/L				12	0.5	6161486			
Total Organic Carbon (C)	mg/L	13	0.50	6161502	13	0.50	6161502	6.7	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167293	<0.010	0.010	6167293	<0.010	0.010	6167293
pH	pH	5.32	N/A	6161589	5.66	N/A	6164137	6.22	N/A	6164116
Total Phosphorus	mg/L	<0.020	0.020	6158894				<0.020	0.020	6158894
Salinity	N/A	<2.0	2.0	6161198				<2.0	2.0	6161198
Reactive Silica (SiO2)	mg/L	2.1	0.50	6167291	2.0	0.50	6167291	1.4	0.50	6167291
Total Suspended Solids	mg/L	1.2	1.0	6161340				2.8	1.0	6161340

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Elevated reporting limit due to sample matrix.



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW873			JWW874			JWW875		
Sampling Date		2019/06/03 10:15			2019/06/03 10:15			2019/06/03 11:00		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch	SW 14	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167290	<2.0	2.0	6167290	<2.0	2.0	6167290
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6164184				<0.0050	0.0050	6164157
Turbidity	NTU	0.96	0.10	6163756	0.47	0.10	6163754	1.4	0.10	6163756
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192958				<0.0030	0.0030	6192958
Conductivity	uS/cm	17	1.0	6161594	19	1.0	6164141	22	1.0	6164134
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572				<0.010	0.010	6170572
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6161324				ATTACHED	N/A	6161324
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW876			JWW877			JWW877		
Sampling Date		2019/06/03 11:00			2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	RDL	QC Batch	FMS DUP 1 Lab-Dup	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.120	N/A	6156613	0.110	N/A	6156613			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606			
Calculated TDS	mg/L	10	1.0	6156630	9.0	1.0	6156630			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606			
Cation Sum	me/L	0.180	N/A	6156613	0.160	N/A	6156613			
Hardness (CaCO3)	mg/L	2.8	1.0	6156609	2.2	1.0	6156609			
Ion Balance (% Difference)	%	20.0	N/A	6156611	18.5	N/A	6156611			
Langelier Index (@ 20C)	N/A	NC		6156626	NC		6156626			
Langelier Index (@ 4C)	N/A	NC		6156628	NC		6156628			
Nitrate (N)	mg/L	<0.050	0.050	6156614	<0.050	0.050	6156614			
Saturation pH (@ 20C)	N/A	NC		6156626	NC		6156626			
Saturation pH (@ 4C)	N/A	NC		6156628	NC		6156628			

Inorganics										
Acidity	mg/L				<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167285	<5.0	5.0	6167297			
Total Chemical Oxygen Demand	mg/L				<20	20	6161311			
Dissolved Chloride (Cl-)	mg/L	4.3	1.0	6167288	4.0	1.0	6167300			
Colour	TCU	46	5.0	6159653	6.5	5.0	6159653			
Total Dissolved Solids	mg/L				<10	10	6161936			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6164136			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167294	<0.050	0.050	6167305			
Nitrite (N)	mg/L	<0.010	0.010	6167295	<0.010	0.010	6167306			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902	<0.050	0.050	6161902			
Dissolved Organic Carbon (C)	mg/L	6.7	0.5	6161486						
Total Organic Carbon (C)	mg/L	6.5	0.50	6161500	2.0	0.50	6161502	2.0	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167293	<0.010	0.010	6167304			
pH	pH	5.84	N/A	6161620	6.04	N/A	6164116			
Total Phosphorus	mg/L				<0.020	0.020	6158894			
Salinity	N/A				<2.0	2.0	6161198			
Reactive Silica (SiO2)	mg/L	1.4	0.50	6167291	1.7	0.50	6167303			
Total Suspended Solids	mg/L				<1.0	1.0	6161340			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW876			JWW877			JWW877		
Sampling Date		2019/06/03 11:00			2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	RDL	QC Batch	FMS DUP 1 Lab-Dup	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167290	<2.0	2.0	6167301			
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6164184			
Turbidity	NTU	0.14	0.10	6163754	0.47	0.10	6163756			
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192958			
Conductivity	uS/cm	20	1.0	6161624	19	1.0	6164134			
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6161324			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW878			JWW879		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FMS DUP 1 FF	RDL	QC Batch	FIELD/FILTER BLANK 1	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.110	N/A	6156613	0.00	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606
Calculated TDS	mg/L	9.0	1.0	6156630	<1.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606	<1.0	1.0	6156606
Cation Sum	me/L	0.150	N/A	6156613	0.0100	N/A	6156613
Hardness (CaCO3)	mg/L	2.2	1.0	6156609	<1.0	1.0	6156609
Ion Balance (% Difference)	%	15.4	N/A	6156611	100	N/A	6156611
Langelier Index (@ 20C)	N/A	NC		6156626	NC		6156626
Langelier Index (@ 4C)	N/A	NC		6156628	NC		6156628
Nitrate (N)	mg/L	<0.050	0.050	6156614	<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A	NC		6156626	NC		6156626
Saturation pH (@ 4C)	N/A	NC		6156628	NC		6156628
Inorganics							
Acidity	mg/L				<5.0	5.0	6174090
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167297	<5.0	5.0	6167297
Total Chemical Oxygen Demand	mg/L				<20	20	6161311
Dissolved Chloride (Cl-)	mg/L	3.9	1.0	6167300	<1.0	1.0	6167300
Colour	TCU	6.0	5.0	6159653	<5.0	5.0	6159653
Total Dissolved Solids	mg/L				<10	10	6161936
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6161614
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167305	<0.050	0.050	6167305
Nitrite (N)	mg/L	<0.010	0.010	6167306	<0.010	0.010	6167306
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902	<0.050	0.050	6161902
Dissolved Organic Carbon (C)	mg/L	2.1	0.5	6161486			
Total Organic Carbon (C)	mg/L	2.2	0.50	6161500	<0.50	0.50	6161502
Orthophosphate (P)	mg/L	<0.010	0.010	6167304	<0.010	0.010	6167304
pH	pH	6.47	N/A	6161633	6.38	N/A	6161589
Total Phosphorus	mg/L				<0.020	0.020	6158894
Salinity	N/A				<2.0	2.0	6161198
Reactive Silica (SiO2)	mg/L	2.1	0.50	6167303	<0.50	0.50	6167303
Total Suspended Solids	mg/L				<1.0	1.0	6161340
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167301	<2.0	2.0	6167301
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



BV Labs Job #: B9E9646
 Report Date: 2019/06/26

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW878			JWW879		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FMS DUP 1 FF	RDL	QC Batch	FIELD/FILTER BLANK 1	RDL	QC Batch
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6164168
Turbidity	NTU	0.59	0.10	6163754	<0.10	0.10	6163756
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192958
Conductivity	uS/cm	21	1.0	6161639	<1.0	1.0	6161594
RADIONUCLIDE							
Radium-226	Bq/L				<0.010	0.010	6170572
Subcontracted Analysis							
Subcontract Parameter	N/A				ATTACHED	N/A	6161324
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW879			JWW880		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FIELD/FILTER BLANK 1 Lab-Dup	RDL	QC Batch	FIELD/FILTER BLANK 1 FF	RDL	QC Batch

Calculated Parameters							
Anion Sum	me/L				0.00	N/A	6156613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606
Calculated TDS	mg/L				<1.0	1.0	6156630
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6156606
Cation Sum	me/L				0.0100	N/A	6156613
Hardness (CaCO3)	mg/L				<1.0	1.0	6156609
Ion Balance (% Difference)	%				100	N/A	6156611
Langelier Index (@ 20C)	N/A				NC		6156626
Langelier Index (@ 4C)	N/A				NC		6156628
Nitrate (N)	mg/L				<0.050	0.050	6156614
Saturation pH (@ 20C)	N/A				NC		6156626
Saturation pH (@ 4C)	N/A				NC		6156628

Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167297
Dissolved Chloride (Cl-)	mg/L				<1.0	1.0	6167300
Colour	TCU				<5.0	5.0	6159653
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6167305
Nitrite (N)	mg/L				<0.010	0.010	6167306
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6161902
Dissolved Organic Carbon (C)	mg/L				<0.5	0.5	6161486
Total Organic Carbon (C)	mg/L				<0.50	0.50	6163938
Orthophosphate (P)	mg/L				<0.010	0.010	6167304
pH	pH				6.66	N/A	6161633
Reactive Silica (SiO2)	mg/L				<0.50	0.50	6167303
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6167301
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6164168			
Turbidity	NTU				<0.10	0.10	6163754
Conductivity	uS/cm				2.6	1.0	6161639

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW881			JWW881		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.00	N/A	6156613			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606			
Calculated TDS	mg/L	<1.0	1.0	6156630			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6156606			
Cation Sum	me/L	0.00	N/A	6156613			
Hardness (CaCO3)	mg/L	<1.0	1.0	6156609			
Langelier Index (@ 20C)	N/A	NC		6156626			
Langelier Index (@ 4C)	N/A	NC		6156628			
Nitrate (N)	mg/L	<0.050	0.050	6156614			
Saturation pH (@ 20C)	N/A	NC		6156626			
Saturation pH (@ 4C)	N/A	NC		6156628			
Inorganics							
Acidity	mg/L	<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167297			
Total Chemical Oxygen Demand	mg/L	<20	20	6161311			
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6167300			
Colour	TCU	<5.0	5.0	6159653			
Total Dissolved Solids	mg/L	<10	10	6161936			
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6164136			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6167305			
Nitrite (N)	mg/L	<0.010	0.010	6167306			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902			
Dissolved Organic Carbon (C)	mg/L	<0.5	0.5	6167479			
Total Organic Carbon (C)	mg/L	<0.50	0.50	6161502			
Orthophosphate (P)	mg/L	<0.010	0.010	6167304			
pH	pH	6.06	N/A	6164116			
Total Phosphorus	mg/L	<0.020	0.020	6158894	<0.020	0.020	6158894
Salinity	N/A	<2.0	2.0	6161198			
Reactive Silica (SiO2)	mg/L	<0.50	0.50	6167303			
Total Suspended Solids	mg/L	<1.0	1.0	6161340			
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6167301			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BV Labs Job #: B9E9646
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McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JWW881			JWW881		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Turbidity	NTU	0.11	0.10	6163754			
Conductivity	uS/cm	<1.0	1.0	6164134			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JWV274	JWV274			JWV275		
Sampling Date		2019/06/03 08:20	2019/06/03 08:20			2019/06/03 08:20		
COC Number		719798-01-01	719798-01-01			719798-01-01		
	UNITS	SW 2	SW 2 Lab-Dup	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch
Metals								
Dissolved Mercury (Hg)	ug/L					<0.013	0.013	6158873
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6158872			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								

BV Labs ID		JWV276			JWV277			JWV278		
Sampling Date		2019/06/03 09:30			2019/06/03 09:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3	RDL	QC Batch	SW 3 (FILTERED)	RDL	QC Batch	SW 6	RDL	QC Batch
Metals										
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6158873			
Total Mercury (Hg)	ug/L	<0.013	0.013	6158872				<0.013	0.013	6158872
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWV279			JWV280			JWV281		
Sampling Date		2019/06/03 13:30			2019/06/03 11:30			2019/06/03 11:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 6 (FILTERED)	RDL	QC Batch	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch
Metals										
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6158873				<0.013	0.013	6158873
Total Mercury (Hg)	ug/L				<0.013	0.013	6158872			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JWV282			JWV283			JWW871		
Sampling Date		2019/06/03 12:35			2019/06/03 12:35			2019/06/03 08:50		
COC Number		719798-01-01			719798-01-01			719798-02-01		
	UNITS	SW 10	RDL	QC Batch	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch
Metals										
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6158873			
Total Mercury (Hg)	ug/L	<0.013	0.013	6158872				<0.013	0.013	6158872
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWW872			JWW873			JWW874		
Sampling Date		2019/06/03 08:50			2019/06/03 10:15			2019/06/03 10:15		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 11 (FILTERED)	RDL	QC Batch	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch
Metals										
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6158873				<0.013	0.013	6158873
Total Mercury (Hg)	ug/L				<0.013	0.013	6158872			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWW875			JWW876			JWW877		
Sampling Date		2019/06/03 11:00			2019/06/03 11:00			2019/06/03		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 14	RDL	QC Batch	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	RDL	QC Batch
Metals										
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6158873			
Total Mercury (Hg)	ug/L	<0.013	0.013	6158872				<0.013	0.013	6158872
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



BV Labs Job #: B9E9646
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McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JWW878			JWW879		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FMS DUP 1 FF	RDL	QC Batch	FIELD/FILTER BLANK 1	RDL	QC Batch
Metals							
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6158873			
Total Mercury (Hg)	ug/L				<0.013	0.013	6158872
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

BV Labs ID		JWW880			JWW881		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FIELD/FILTER BLANK 1 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Metals							
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6158873			
Total Mercury (Hg)	ug/L				<0.013	0.013	6158872
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV274			JWV275			JWV276		
Sampling Date		2019/06/03 08:20			2019/06/03 08:20			2019/06/03 09:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch	SW 3	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L				120	5.0	6161921			
Total Aluminum (Al)	ug/L	140	5.0	6161399				32	5.0	6161399
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6161921			
Total Antimony (Sb)	ug/L	<1.0	1.0	6161399				<1.0	1.0	6161399
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6161921			
Total Arsenic (As)	ug/L	<1.0	1.0	6161399				<1.0	1.0	6161399
Dissolved Barium (Ba)	ug/L				3.5	1.0	6161921			
Total Barium (Ba)	ug/L	3.2	1.0	6161399				4.5	1.0	6161399
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6161921			
Total Beryllium (Be)	ug/L	<1.0	1.0	6161399				<1.0	1.0	6161399
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6161921			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Boron (B)	ug/L				<50	50	6161921			
Total Boron (B)	ug/L	<50	50	6161399				<50	50	6161399
Dissolved Cadmium (Cd)	ug/L				0.018	0.010	6161921			
Total Cadmium (Cd)	ug/L	0.016	0.010	6161399				<0.010	0.010	6161399
Dissolved Calcium (Ca)	ug/L				470	100	6161921			
Total Calcium (Ca)	ug/L	440	100	6161399				500	100	6161399
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6161921			
Total Chromium (Cr)	ug/L	1.0	1.0	6161399				<1.0	1.0	6161399
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6161921			
Total Cobalt (Co)	ug/L	<0.40	0.40	6161399				<0.40	0.40	6161399
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6161921			
Total Copper (Cu)	ug/L	<0.50	0.50	6161399				<0.50	0.50	6161399
Dissolved Iron (Fe)	ug/L				65	50	6161921			
Total Iron (Fe)	ug/L	110	50	6161399				<50	50	6161399
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6161921			
Total Lead (Pb)	ug/L	<0.50	0.50	6161399				<0.50	0.50	6161399
Dissolved Magnesium (Mg)	ug/L				280	100	6161921			
Total Magnesium (Mg)	ug/L	290	100	6161399				250	100	6161399
Dissolved Manganese (Mn)	ug/L				38	2.0	6161921			
Total Manganese (Mn)	ug/L	38	2.0	6161399				17	2.0	6161399
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6161921			
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV274			JWV275			JWV276		
Sampling Date		2019/06/03 08:20			2019/06/03 08:20			2019/06/03 09:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch	SW 3	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6161921			
Total Nickel (Ni)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Phosphorus (P)	ug/L				<100	100	6161921			
Total Phosphorus (P)	ug/L	<100	100	6161399				<100	100	6161399
Dissolved Potassium (K)	ug/L				270	100	6161921			
Total Potassium (K)	ug/L	250	100	6161399				130	100	6161399
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6161921			
Total Selenium (Se)	ug/L	<1.0	1.0	6161399				<1.0	1.0	6161399
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6161921			
Total Silver (Ag)	ug/L	<0.10	0.10	6161399				<0.10	0.10	6161399
Dissolved Sodium (Na)	ug/L				2100	100	6161921			
Total Sodium (Na)	ug/L	2300	100	6161399				2500	100	6161399
Dissolved Strontium (Sr)	ug/L				5.0	2.0	6161921			
Total Strontium (Sr)	ug/L	5.1	2.0	6161399				6.8	2.0	6161399
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6161921			
Total Thallium (Tl)	ug/L	<0.10	0.10	6161399				<0.10	0.10	6161399
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6161921			
Total Tin (Sn)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6161921			
Total Titanium (Ti)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Uranium (U)	ug/L				<0.10	0.10	6161921			
Total Uranium (U)	ug/L	<0.10	0.10	6161399				<0.10	0.10	6161399
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6161921			
Total Vanadium (V)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6161921			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6161399				<2.0	2.0	6161399
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6161921			
Total Zinc (Zn)	ug/L	<5.0	5.0	6161399				<5.0	5.0	6161399

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV277			JWV278			JWV279		
Sampling Date		2019/06/03 09:30			2019/06/03 13:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3 (FILTERED)	RDL	QC Batch	SW 6	RDL	QC Batch	SW 6 (FILTERED)	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	32	5.0	6161921				170	5.0	6161921
Total Aluminum (Al)	ug/L				190	5.0	6161399			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Antimony (Sb)	ug/L				<1.0	1.0	6161399			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6161921				1.7	1.0	6161921
Total Arsenic (As)	ug/L				1.9	1.0	6161399			
Dissolved Barium (Ba)	ug/L	4.4	1.0	6161921				4.1	1.0	6161921
Total Barium (Ba)	ug/L				4.0	1.0	6161399			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Beryllium (Be)	ug/L				<1.0	1.0	6161399			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Bismuth (Bi)	ug/L				<2.0	2.0	6161399			
Dissolved Boron (B)	ug/L	<50	50	6161921				<50	50	6161921
Total Boron (B)	ug/L				<50	50	6161399			
Dissolved Cadmium (Cd)	ug/L	0.012	0.010	6161921				0.017	0.010	6161921
Total Cadmium (Cd)	ug/L				0.018	0.010	6161399			
Dissolved Calcium (Ca)	ug/L	500	100	6161921				590	100	6161921
Total Calcium (Ca)	ug/L				570	100	6161399			
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6161921				1.0	1.0	6161921
Total Chromium (Cr)	ug/L				<1.0	1.0	6161399			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6161921				<0.40	0.40	6161921
Total Cobalt (Co)	ug/L				<0.40	0.40	6161399			
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6161921				<0.50	0.50	6161921
Total Copper (Cu)	ug/L				<0.50	0.50	6161399			
Dissolved Iron (Fe)	ug/L	<50	50	6161921				130	50	6161921
Total Iron (Fe)	ug/L				190	50	6161399			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6161921				<0.50	0.50	6161921
Total Lead (Pb)	ug/L				<0.50	0.50	6161399			
Dissolved Magnesium (Mg)	ug/L	240	100	6161921				290	100	6161921
Total Magnesium (Mg)	ug/L				290	100	6161399			
Dissolved Manganese (Mn)	ug/L	20	2.0	6161921				50	2.0	6161921
Total Manganese (Mn)	ug/L				54	2.0	6161399			
Dissolved Molybdenum (Mo)	ug/L	4.0	2.0	6161921				<2.0	2.0	6161921
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6161399			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV277			JWV278			JWV279		
Sampling Date		2019/06/03 09:30			2019/06/03 13:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3 (FILTERED)	RDL	QC Batch	SW 6	RDL	QC Batch	SW 6 (FILTERED)	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Nickel (Ni)	ug/L				<2.0	2.0	6161399			
Dissolved Phosphorus (P)	ug/L	<100	100	6161921				<100	100	6161921
Total Phosphorus (P)	ug/L				<100	100	6161399			
Dissolved Potassium (K)	ug/L	150	100	6161921				280	100	6161921
Total Potassium (K)	ug/L				290	100	6161399			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Selenium (Se)	ug/L				<1.0	1.0	6161399			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Silver (Ag)	ug/L				<0.10	0.10	6161399			
Dissolved Sodium (Na)	ug/L	2400	100	6161921				2700	100	6161921
Total Sodium (Na)	ug/L				2800	100	6161399			
Dissolved Strontium (Sr)	ug/L	6.7	2.0	6161921				4.6	2.0	6161921
Total Strontium (Sr)	ug/L				4.8	2.0	6161399			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Thallium (Tl)	ug/L				<0.10	0.10	6161399			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Tin (Sn)	ug/L				<2.0	2.0	6161399			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Titanium (Ti)	ug/L				<2.0	2.0	6161399			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Uranium (U)	ug/L				<0.10	0.10	6161399			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Vanadium (V)	ug/L				<2.0	2.0	6161399			
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Zirconium (Zr)	ug/L				<2.0	2.0	6161399			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6161921				<5.0	5.0	6161921
Total Zinc (Zn)	ug/L				<5.0	5.0	6161399			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV280			JWV281			JWV282		
Sampling Date		2019/06/03 11:30			2019/06/03 11:30			2019/06/03 12:35		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch	SW 10	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L				150	5.0	6161921			
Total Aluminum (Al)	ug/L	190	5.0	6161382				190	5.0	6161399
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6161921			
Total Antimony (Sb)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161399
Dissolved Arsenic (As)	ug/L				1.1	1.0	6161921			
Total Arsenic (As)	ug/L	1.4	1.0	6161382				<1.0	1.0	6161399
Dissolved Barium (Ba)	ug/L				2.2	1.0	6161921			
Total Barium (Ba)	ug/L	2.5	1.0	6161382				5.0	1.0	6161399
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6161921			
Total Beryllium (Be)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161399
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6161921			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
Dissolved Boron (B)	ug/L				<50	50	6161921			
Total Boron (B)	ug/L	<50	50	6161382				<50	50	6161399
Dissolved Cadmium (Cd)	ug/L				<0.010	0.010	6161921			
Total Cadmium (Cd)	ug/L	<0.010	0.010	6161382				0.019	0.010	6161399
Dissolved Calcium (Ca)	ug/L				630	100	6161921			
Total Calcium (Ca)	ug/L	670	100	6161382				480	100	6161399
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6161921			
Total Chromium (Cr)	ug/L	1.2	1.0	6161382				1.2	1.0	6161399
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6161921			
Total Cobalt (Co)	ug/L	<0.40	0.40	6161382				<0.40	0.40	6161399
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6161921			
Total Copper (Cu)	ug/L	<0.50	0.50	6161382				<0.50	0.50	6161399
Dissolved Iron (Fe)	ug/L				150	50	6161921			
Total Iron (Fe)	ug/L	230	50	6161382				120	50	6161399
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6161921			
Total Lead (Pb)	ug/L	<0.50	0.50	6161382				<0.50	0.50	6161399
Dissolved Magnesium (Mg)	ug/L				260	100	6161921			
Total Magnesium (Mg)	ug/L	280	100	6161382				280	100	6161399
Dissolved Manganese (Mn)	ug/L				59	2.0	6161921			
Total Manganese (Mn)	ug/L	70	2.0	6161382				59	2.0	6161399
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6161921			
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV280			JWV281			JWV282		
Sampling Date		2019/06/03 11:30			2019/06/03 11:30			2019/06/03 12:35		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch	SW 10	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6161921			
Total Nickel (Ni)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
Dissolved Phosphorus (P)	ug/L				<100	100	6161921			
Total Phosphorus (P)	ug/L	<100	100	6161382				<100	100	6161399
Dissolved Potassium (K)	ug/L				<100	100	6161921			
Total Potassium (K)	ug/L	<100	100	6161382				250	100	6161399
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6161921			
Total Selenium (Se)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161399
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6161921			
Total Silver (Ag)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161399
Dissolved Sodium (Na)	ug/L				2100	100	6161921			
Total Sodium (Na)	ug/L	2400	100	6161382				2400	100	6161399
Dissolved Strontium (Sr)	ug/L				3.9	2.0	6161921			
Total Strontium (Sr)	ug/L	4.1	2.0	6161382				4.1	2.0	6161399
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6161921			
Total Thallium (Tl)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161399
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6161921			
Total Tin (Sn)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6161921			
Total Titanium (Ti)	ug/L	2.2	2.0	6161382				<2.0	2.0	6161399
Dissolved Uranium (U)	ug/L				<0.10	0.10	6161921			
Total Uranium (U)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161399
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6161921			
Total Vanadium (V)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6161921			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161399
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6161921			
Total Zinc (Zn)	ug/L	<5.0	5.0	6161382				<5.0	5.0	6161399

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV283			JWW871			JWW872		
Sampling Date		2019/06/03 12:35			2019/06/03 08:50			2019/06/03 08:50		
COC Number		719798-01-01			719798-02-01			719798-02-01		
	UNITS	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch	SW 11 (FILTERED)	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	160	5.0	6161921				180	5.0	6161921
Total Aluminum (Al)	ug/L				190	5.0	6161382			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Antimony (Sb)	ug/L				<1.0	1.0	6161382			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Arsenic (As)	ug/L				<1.0	1.0	6161382			
Dissolved Barium (Ba)	ug/L	5.0	1.0	6161921				2.3	1.0	6161921
Total Barium (Ba)	ug/L				2.3	1.0	6161382			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Beryllium (Be)	ug/L				<1.0	1.0	6161382			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Bismuth (Bi)	ug/L				<2.0	2.0	6161382			
Dissolved Boron (B)	ug/L	<50	50	6161921				<50	50	6161921
Total Boron (B)	ug/L				<50	50	6161382			
Dissolved Cadmium (Cd)	ug/L	0.019	0.010	6161921				0.012	0.010	6161921
Total Cadmium (Cd)	ug/L				0.013	0.010	6161382			
Dissolved Calcium (Ca)	ug/L	480	100	6161921				460	100	6161921
Total Calcium (Ca)	ug/L				440	100	6161382			
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6161921				1.1	1.0	6161921
Total Chromium (Cr)	ug/L				<1.0	1.0	6161382			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6161921				<0.40	0.40	6161921
Total Cobalt (Co)	ug/L				<0.40	0.40	6161382			
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6161921				<0.50	0.50	6161921
Total Copper (Cu)	ug/L				<0.50	0.50	6161382			
Dissolved Iron (Fe)	ug/L	71	50	6161921				180	50	6161921
Total Iron (Fe)	ug/L				190	50	6161382			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6161921				<0.50	0.50	6161921
Total Lead (Pb)	ug/L				<0.50	0.50	6161382			
Dissolved Magnesium (Mg)	ug/L	270	100	6161921				230	100	6161921
Total Magnesium (Mg)	ug/L				230	100	6161382			
Dissolved Manganese (Mn)	ug/L	54	2.0	6161921				25	2.0	6161921
Total Manganese (Mn)	ug/L				24	2.0	6161382			
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6161382			
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWV283			JWW871			JWW872		
Sampling Date		2019/06/03 12:35			2019/06/03 08:50			2019/06/03 08:50		
COC Number		719798-01-01			719798-02-01			719798-02-01		
	UNITS	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch	SW 11 (FILTERED)	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Nickel (Ni)	ug/L				<2.0	2.0	6161382			
Dissolved Phosphorus (P)	ug/L	<100	100	6161921				<100	100	6161921
Total Phosphorus (P)	ug/L				<100	100	6161382			
Dissolved Potassium (K)	ug/L	240	100	6161921				210	100	6161921
Total Potassium (K)	ug/L				210	100	6161382			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Selenium (Se)	ug/L				<1.0	1.0	6161382			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Silver (Ag)	ug/L				<0.10	0.10	6161382			
Dissolved Sodium (Na)	ug/L	2500	100	6161921				2000	100	6161921
Total Sodium (Na)	ug/L				2000	100	6161382			
Dissolved Strontium (Sr)	ug/L	4.4	2.0	6161921				4.7	2.0	6161921
Total Strontium (Sr)	ug/L				4.3	2.0	6161382			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Thallium (Tl)	ug/L				<0.10	0.10	6161382			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Tin (Sn)	ug/L				<2.0	2.0	6161382			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6161921				2.1	2.0	6161921
Total Titanium (Ti)	ug/L				2.8	2.0	6161382			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Uranium (U)	ug/L				<0.10	0.10	6161382			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Vanadium (V)	ug/L				<2.0	2.0	6161382			
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Zirconium (Zr)	ug/L				<2.0	2.0	6161382			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6161921				<5.0	5.0	6161921
Total Zinc (Zn)	ug/L				<5.0	5.0	6161382			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW873			JWW874			JWW875		
Sampling Date		2019/06/03 10:15			2019/06/03 10:15			2019/06/03 11:00		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch	SW 14	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L				210	5.0	6161921			
Total Aluminum (Al)	ug/L	230	5.0	6161382				180	5.0	6161382
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6161921			
Total Antimony (Sb)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161382
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6161921			
Total Arsenic (As)	ug/L	<1.0	1.0	6161382				5.2	1.0	6161382
Dissolved Barium (Ba)	ug/L				1.9	1.0	6161921			
Total Barium (Ba)	ug/L	1.9	1.0	6161382				4.4	1.0	6161382
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6161921			
Total Beryllium (Be)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161382
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6161921			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
Dissolved Boron (B)	ug/L				<50	50	6161921			
Total Boron (B)	ug/L	<50	50	6161382				<50	50	6161382
Dissolved Cadmium (Cd)	ug/L				0.012	0.010	6161921			
Total Cadmium (Cd)	ug/L	<0.010	0.010	6161382				0.012	0.010	6161382
Dissolved Calcium (Ca)	ug/L				600	100	6161921			
Total Calcium (Ca)	ug/L	640	100	6161382				600	100	6161382
Dissolved Chromium (Cr)	ug/L				1.1	1.0	6161921			
Total Chromium (Cr)	ug/L	<1.0	1.0	6161382				1.2	1.0	6161382
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6161921			
Total Cobalt (Co)	ug/L	<0.40	0.40	6161382				<0.40	0.40	6161382
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6161921			
Total Copper (Cu)	ug/L	0.50	0.50	6161382				<0.50	0.50	6161382
Dissolved Iron (Fe)	ug/L				350	50	6161921			
Total Iron (Fe)	ug/L	410	50	6161382				230	50	6161382
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6161921			
Total Lead (Pb)	ug/L	<0.50	0.50	6161382				<0.50	0.50	6161382
Dissolved Magnesium (Mg)	ug/L				230	100	6161921			
Total Magnesium (Mg)	ug/L	250	100	6161382				290	100	6161382
Dissolved Manganese (Mn)	ug/L				37	2.0	6161921			
Total Manganese (Mn)	ug/L	39	2.0	6161382				59	2.0	6161382
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6161921			
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW873			JWW874			JWW875		
Sampling Date		2019/06/03 10:15			2019/06/03 10:15			2019/06/03 11:00		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch	SW 14	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6161921			
Total Nickel (Ni)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
Dissolved Phosphorus (P)	ug/L				<100	100	6161921			
Total Phosphorus (P)	ug/L	<100	100	6161382				<100	100	6161382
Dissolved Potassium (K)	ug/L				160	100	6161921			
Total Potassium (K)	ug/L	160	100	6161382				250	100	6161382
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6161921			
Total Selenium (Se)	ug/L	<1.0	1.0	6161382				<1.0	1.0	6161382
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6161921			
Total Silver (Ag)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161382
Dissolved Sodium (Na)	ug/L				2000	100	6161921			
Total Sodium (Na)	ug/L	2200	100	6161382				2600	100	6161382
Dissolved Strontium (Sr)	ug/L				4.7	2.0	6161921			
Total Strontium (Sr)	ug/L	5.0	2.0	6161382				5.4	2.0	6161382
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6161921			
Total Thallium (Tl)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161382
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6161921			
Total Tin (Sn)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6161921			
Total Titanium (Ti)	ug/L	2.7	2.0	6161382				5.8	2.0	6161382
Dissolved Uranium (U)	ug/L				<0.10	0.10	6161921			
Total Uranium (U)	ug/L	<0.10	0.10	6161382				<0.10	0.10	6161382
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6161921			
Total Vanadium (V)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6161921			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6161382				<2.0	2.0	6161382
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6161921			
Total Zinc (Zn)	ug/L	<5.0	5.0	6161382				<5.0	5.0	6161382

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW876			JWW877			JWW878		
Sampling Date		2019/06/03 11:00			2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	RDL	QC Batch	FMS DUP 1 FF	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	150	5.0	6161921				26	5.0	6161921
Total Aluminum (Al)	ug/L				31	5.0	6161399			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Antimony (Sb)	ug/L				<1.0	1.0	6161399			
Dissolved Arsenic (As)	ug/L	4.4	1.0	6161921				<1.0	1.0	6161921
Total Arsenic (As)	ug/L				<1.0	1.0	6161399			
Dissolved Barium (Ba)	ug/L	4.1	1.0	6161921				4.1	1.0	6161921
Total Barium (Ba)	ug/L				4.3	1.0	6161399			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Beryllium (Be)	ug/L				<1.0	1.0	6161399			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Bismuth (Bi)	ug/L				<2.0	2.0	6161399			
Dissolved Boron (B)	ug/L	<50	50	6161921				<50	50	6161921
Total Boron (B)	ug/L				<50	50	6161399			
Dissolved Cadmium (Cd)	ug/L	0.014	0.010	6161921				<0.010	0.010	6161921
Total Cadmium (Cd)	ug/L				<0.010	0.010	6161399			
Dissolved Calcium (Ca)	ug/L	610	100	6161921				500	100	6161921
Total Calcium (Ca)	ug/L				490	100	6161399			
Dissolved Chromium (Cr)	ug/L	1.1	1.0	6161921				1.1	1.0	6161921
Total Chromium (Cr)	ug/L				<1.0	1.0	6161399			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6161921				<0.40	0.40	6161921
Total Cobalt (Co)	ug/L				<0.40	0.40	6161399			
Dissolved Copper (Cu)	ug/L	0.83	0.50	6161921				<0.50	0.50	6161921
Total Copper (Cu)	ug/L				<0.50	0.50	6161399			
Dissolved Iron (Fe)	ug/L	150	50	6161921				<50	50	6161921
Total Iron (Fe)	ug/L				<50	50	6161399			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6161921				<0.50	0.50	6161921
Total Lead (Pb)	ug/L				<0.50	0.50	6161399			
Dissolved Magnesium (Mg)	ug/L	300	100	6161921				240	100	6161921
Total Magnesium (Mg)	ug/L				240	100	6161399			
Dissolved Manganese (Mn)	ug/L	56	2.0	6161921				16	2.0	6161921
Total Manganese (Mn)	ug/L				17	2.0	6161399			
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6161399			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW876			JWW877			JWW878		
Sampling Date		2019/06/03 11:00			2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	RDL	QC Batch	FMS DUP 1 FF	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Nickel (Ni)	ug/L				<2.0	2.0	6161399			
Dissolved Phosphorus (P)	ug/L	<100	100	6161921				<100	100	6161921
Total Phosphorus (P)	ug/L				<100	100	6161399			
Dissolved Potassium (K)	ug/L	270	100	6161921				140	100	6161921
Total Potassium (K)	ug/L				140	100	6161399			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6161921				<1.0	1.0	6161921
Total Selenium (Se)	ug/L				<1.0	1.0	6161399			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Silver (Ag)	ug/L				<0.10	0.10	6161399			
Dissolved Sodium (Na)	ug/L	2600	100	6161921				2400	100	6161921
Total Sodium (Na)	ug/L				2500	100	6161399			
Dissolved Strontium (Sr)	ug/L	5.1	2.0	6161921				6.8	2.0	6161921
Total Strontium (Sr)	ug/L				6.3	2.0	6161399			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Thallium (Tl)	ug/L				<0.10	0.10	6161399			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Tin (Sn)	ug/L				<2.0	2.0	6161399			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Titanium (Ti)	ug/L				<2.0	2.0	6161399			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6161921				<0.10	0.10	6161921
Total Uranium (U)	ug/L				<0.10	0.10	6161399			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Vanadium (V)	ug/L				<2.0	2.0	6161399			
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6161921				<2.0	2.0	6161921
Total Zirconium (Zr)	ug/L				<2.0	2.0	6161399			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6161921				<5.0	5.0	6161921
Total Zinc (Zn)	ug/L				<5.0	5.0	6161399			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW879			JWW880		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FIELD/FILTER BLANK 1	RDL	QC Batch	FIELD/FILTER BLANK 1 FF	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6161921
Total Aluminum (Al)	ug/L	<5.0	5.0	6161399			
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6161921
Total Antimony (Sb)	ug/L	<1.0	1.0	6161399			
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6161921
Total Arsenic (As)	ug/L	<1.0	1.0	6161399			
Dissolved Barium (Ba)	ug/L				<1.0	1.0	6161921
Total Barium (Ba)	ug/L	<1.0	1.0	6161399			
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6161921
Total Beryllium (Be)	ug/L	<1.0	1.0	6161399			
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6161921
Total Bismuth (Bi)	ug/L	<2.0	2.0	6161399			
Dissolved Boron (B)	ug/L				<50	50	6161921
Total Boron (B)	ug/L	<50	50	6161399			
Dissolved Cadmium (Cd)	ug/L				<0.010	0.010	6161921
Total Cadmium (Cd)	ug/L	<0.010	0.010	6161399			
Dissolved Calcium (Ca)	ug/L				<100	100	6161921
Total Calcium (Ca)	ug/L	<100	100	6161399			
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6161921
Total Chromium (Cr)	ug/L	1.0	1.0	6161399			
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6161921
Total Cobalt (Co)	ug/L	<0.40	0.40	6161399			
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6161921
Total Copper (Cu)	ug/L	<0.50	0.50	6161399			
Dissolved Iron (Fe)	ug/L				<50	50	6161921
Total Iron (Fe)	ug/L	<50	50	6161399			
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6161921
Total Lead (Pb)	ug/L	<0.50	0.50	6161399			
Dissolved Magnesium (Mg)	ug/L				<100	100	6161921
Total Magnesium (Mg)	ug/L	<100	100	6161399			
Dissolved Manganese (Mn)	ug/L				<2.0	2.0	6161921
Total Manganese (Mn)	ug/L	<2.0	2.0	6161399			
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6161921
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6161399			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW879			JWW880		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FIELD/FILTER BLANK 1	RDL	QC Batch	FIELD/FILTER BLANK 1 FF	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6161921
Total Nickel (Ni)	ug/L	<2.0	2.0	6161399			
Dissolved Phosphorus (P)	ug/L				<100	100	6161921
Total Phosphorus (P)	ug/L	<100	100	6161399			
Dissolved Potassium (K)	ug/L				<100	100	6161921
Total Potassium (K)	ug/L	<100	100	6161399			
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6161921
Total Selenium (Se)	ug/L	<1.0	1.0	6161399			
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6161921
Total Silver (Ag)	ug/L	<0.10	0.10	6161399			
Dissolved Sodium (Na)	ug/L				190	100	6161921
Total Sodium (Na)	ug/L	150	100	6161399			
Dissolved Strontium (Sr)	ug/L				<2.0	2.0	6161921
Total Strontium (Sr)	ug/L	<2.0	2.0	6161399			
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6161921
Total Thallium (Tl)	ug/L	<0.10	0.10	6161399			
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6161921
Total Tin (Sn)	ug/L	<2.0	2.0	6161399			
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6161921
Total Titanium (Ti)	ug/L	<2.0	2.0	6161399			
Dissolved Uranium (U)	ug/L				<0.10	0.10	6161921
Total Uranium (U)	ug/L	<0.10	0.10	6161399			
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6161921
Total Vanadium (V)	ug/L	<2.0	2.0	6161399			
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6161921
Total Zirconium (Zr)	ug/L	<2.0	2.0	6161399			
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6161921
Total Zinc (Zn)	ug/L	<5.0	5.0	6161399			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW881		
Sampling Date		2019/06/03		
COC Number		719798-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Metals				
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6167410
Total Aluminum (Al)	ug/L	<5.0	5.0	6161382
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6167410
Total Antimony (Sb)	ug/L	<1.0	1.0	6161382
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6167410
Total Arsenic (As)	ug/L	<1.0	1.0	6161382
Dissolved Barium (Ba)	ug/L	<1.0	1.0	6167410
Total Barium (Ba)	ug/L	<1.0	1.0	6161382
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6167410
Total Beryllium (Be)	ug/L	<1.0	1.0	6161382
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6167410
Total Bismuth (Bi)	ug/L	<2.0	2.0	6161382
Dissolved Boron (B)	ug/L	<50	50	6167410
Total Boron (B)	ug/L	<50	50	6161382
Dissolved Cadmium (Cd)	ug/L	<0.010	0.010	6167410
Total Cadmium (Cd)	ug/L	<0.010	0.010	6161382
Dissolved Calcium (Ca)	ug/L	<100	100	6167410
Total Calcium (Ca)	ug/L	<100	100	6161382
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6167410
Total Chromium (Cr)	ug/L	<1.0	1.0	6161382
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6167410
Total Cobalt (Co)	ug/L	<0.40	0.40	6161382
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6167410
Total Copper (Cu)	ug/L	<0.50	0.50	6161382
Dissolved Iron (Fe)	ug/L	<50	50	6167410
Total Iron (Fe)	ug/L	<50	50	6161382
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6167410
Total Lead (Pb)	ug/L	<0.50	0.50	6161382
Dissolved Magnesium (Mg)	ug/L	<100	100	6167410
Total Magnesium (Mg)	ug/L	<100	100	6161382
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6167410
Total Manganese (Mn)	ug/L	<2.0	2.0	6161382
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6167410
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6161382
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JWW881		
Sampling Date		2019/06/03		
COC Number		719798-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6167410
Total Nickel (Ni)	ug/L	<2.0	2.0	6161382
Dissolved Phosphorus (P)	ug/L	<100	100	6167410
Total Phosphorus (P)	ug/L	<100	100	6161382
Dissolved Potassium (K)	ug/L	<100	100	6167410
Total Potassium (K)	ug/L	<100	100	6161382
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6167410
Total Selenium (Se)	ug/L	<1.0	1.0	6161382
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6167410
Total Silver (Ag)	ug/L	<0.10	0.10	6161382
Dissolved Sodium (Na)	ug/L	<100	100	6167410
Total Sodium (Na)	ug/L	<100	100	6161382
Dissolved Strontium (Sr)	ug/L	<2.0	2.0	6167410
Total Strontium (Sr)	ug/L	<2.0	2.0	6161382
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6167410
Total Thallium (Tl)	ug/L	<0.10	0.10	6161382
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6167410
Total Tin (Sn)	ug/L	<2.0	2.0	6161382
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6167410
Total Titanium (Ti)	ug/L	<2.0	2.0	6161382
Dissolved Uranium (U)	ug/L	<0.10	0.10	6167410
Total Uranium (U)	ug/L	<0.10	0.10	6161382
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6167410
Total Vanadium (V)	ug/L	<2.0	2.0	6161382
Total Zirconium (Zr)	ug/L	<2.0	2.0	6161382
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6167410
Total Zinc (Zn)	ug/L	<5.0	5.0	6161382
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JWV274			JWV275			JWV276		
Sampling Date		2019/06/03 08:20			2019/06/03 08:20			2019/06/03 09:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 2	RDL	QC Batch	SW 2 (FILTERED)	RDL	QC Batch	SW 3	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6163101			
Total Tungsten (W)	ug/L	<1.0	1.0	6172376				<1.0	1.0	6172376
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWV277			JWV278			JWV279		
Sampling Date		2019/06/03 09:30			2019/06/03 13:30			2019/06/03 13:30		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 3 (FILTERED)	RDL	QC Batch	SW 6	RDL	QC Batch	SW 6 (FILTERED)	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6163101				<1.0	1.0	6163101
Total Tungsten (W)	ug/L				<1.0	1.0	6172376			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWV280			JWV281			JWV282		
Sampling Date		2019/06/03 11:30			2019/06/03 11:30			2019/06/03 12:35		
COC Number		719798-01-01			719798-01-01			719798-01-01		
	UNITS	SW 7	RDL	QC Batch	SW 7 (FILTERED)	RDL	QC Batch	SW 10	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6163101			
Total Tungsten (W)	ug/L	<1.0	1.0	6172376				<1.0	1.0	6172376
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JWV283			JWW871			JWW872		
Sampling Date		2019/06/03 12:35			2019/06/03 08:50			2019/06/03 08:50		
COC Number		719798-01-01			719798-02-01			719798-02-01		
	UNITS	SW 10 (FILTERED)	RDL	QC Batch	SW 11	RDL	QC Batch	SW 11 (FILTERED)	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6163101				<1.0	1.0	6163101
Total Tungsten (W)	ug/L				<1.0	1.0	6172376			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWW873			JWW874			JWW875		
Sampling Date		2019/06/03 10:15			2019/06/03 10:15			2019/06/03 11:00		
COC Number		719798-02-01			719798-02-01			719798-02-01		
	UNITS	SW 12	RDL	QC Batch	SW 12 (FILTERED)	RDL	QC Batch	SW 14	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6163101			
Total Tungsten (W)	ug/L	<1.0	1.0	6172376				<1.0	1.0	6172376
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JWW876			JWW877	JWW877			JWW878		
Sampling Date		2019/06/03 11:00			2019/06/03	2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01	719798-02-01			719798-02-01		
	UNITS	SW 14 (FILTERED)	RDL	QC Batch	FMS DUP 1	FMS DUP 1 Lab-Dup	RDL	QC Batch	FMS DUP 1 FF	RDL	QC Batch

Metals											
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6163101					<1.0	1.0	6163101
Total Tungsten (W)	ug/L				<1.0	<1.0	1.0	6172376			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate											



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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JWW879			JWW880		
Sampling Date		2019/06/03			2019/06/03		
COC Number		719798-02-01			719798-02-01		
	UNITS	FIELD/FILTER BLANK 1	RDL	QC Batch	FIELD/FILTER BLANK 1 FF	RDL	QC Batch
Metals							
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6163101
Total Tungsten (W)	ug/L	<1.0	1.0	6172376			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.7°C
Package 2	9.0°C
Package 3	10.7°C
Package 4	4.7°C
Package 5	5.0°C

Sample JVV274 [SW 2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV275 [SW 2 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV276 [SW 3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV277 [SW 3 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV278 [SW 6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV279 [SW 6 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV280 [SW 7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV281 [SW 7 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV282 [SW 10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JVV283 [SW 10 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW871 [SW 11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW872 [SW 11 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW873 [SW 12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW874 [SW 12 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW875 [SW 14] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW876 [SW 14 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW877 [FMS DUP 1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW878 [FMS DUP 1 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW879 [FIELD/FILTER BLANK 1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JWW880 [FIELD/FILTER BLANK 1 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.



QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6158872	CCR	Matrix Spike [JWV276-11]	Total Mercury (Hg)	2019/06/06		102	%	80 - 120
6158872	CCR	Spiked Blank	Total Mercury (Hg)	2019/06/06		103	%	80 - 120
6158872	CCR	Method Blank	Total Mercury (Hg)	2019/06/06	<0.013		ug/L	
6158872	CCR	RPD [JWV274-11]	Total Mercury (Hg)	2019/06/06	NC		%	20
6158873	CCR	Matrix Spike	Dissolved Mercury (Hg)	2019/06/06		104	%	80 - 120
6158873	CCR	Spiked Blank	Dissolved Mercury (Hg)	2019/06/06		101	%	80 - 120
6158873	CCR	Method Blank	Dissolved Mercury (Hg)	2019/06/06	<0.013		ug/L	
6158873	CCR	RPD	Dissolved Mercury (Hg)	2019/06/06	NC		%	20
6158874	NRG	Matrix Spike	Total Phosphorus	2019/06/06		107	%	80 - 120
6158874	NRG	Spiked Blank	Total Phosphorus	2019/06/06		100	%	80 - 120
6158874	NRG	Method Blank	Total Phosphorus	2019/06/06	<0.020		mg/L	
6158874	NRG	RPD	Total Phosphorus	2019/06/06	NC		%	25
6158894	NRG	Matrix Spike [JWW881-07]	Total Phosphorus	2019/06/06		110	%	80 - 120
6158894	NRG	Spiked Blank	Total Phosphorus	2019/06/06		103	%	80 - 120
6158894	NRG	Method Blank	Total Phosphorus	2019/06/06	<0.020		mg/L	
6158894	NRG	RPD [JWW881-07]	Total Phosphorus	2019/06/06	NC		%	25
6159650	NRG	Spiked Blank	Colour	2019/06/06		108	%	80 - 120
6159650	NRG	Method Blank	Colour	2019/06/06	<5.0		TCU	
6159650	NRG	RPD [JWV275-01]	Colour	2019/06/06	1.5		%	20
6159653	NRG	Spiked Blank	Colour	2019/06/06		114	%	80 - 120
6159653	NRG	Method Blank	Colour	2019/06/06	<5.0		TCU	
6159653	NRG	RPD	Colour	2019/06/06	NC		%	20
6159706	NRG	Matrix Spike [JWV277-03]	Nitrogen (Ammonia Nitrogen)	2019/06/06		106	%	80 - 120
6159706	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07		100	%	80 - 120
6159706	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07	<0.050		mg/L	
6159706	NRG	RPD [JWV277-03]	Nitrogen (Ammonia Nitrogen)	2019/06/06	16		%	20
6161198	BBD	QC Standard	Salinity	2019/06/06		101	%	80 - 120
6161198	BBD	Method Blank	Salinity	2019/06/06	<2.0		N/A	
6161198	BBD	RPD	Salinity	2019/06/06	NC		%	25
6161311	ZZH	Matrix Spike	Total Chemical Oxygen Demand	2019/06/06		103	%	80 - 120
6161311	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/06/06		100	%	80 - 120
6161311	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/06/06		103	%	80 - 120
6161311	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/06/06	<20		mg/L	
6161311	ZZH	RPD	Total Chemical Oxygen Demand	2019/06/06	NC		%	25
6161340	AM6	QC Standard	Total Suspended Solids	2019/06/10		100	%	80 - 120
6161340	AM6	Method Blank	Total Suspended Solids	2019/06/10	<1.0		mg/L	
6161340	AM6	RPD	Total Suspended Solids	2019/06/10	15		%	20
6161380	EMT	QC Standard	Turbidity	2019/06/06		106	%	80 - 120
6161380	EMT	Spiked Blank	Turbidity	2019/06/06		97	%	80 - 120
6161380	EMT	Method Blank	Turbidity	2019/06/06	<0.10		NTU	
6161380	EMT	RPD [JWV275-01]	Turbidity	2019/06/06	18		%	20
6161382	AFM	Matrix Spike	Total Aluminum (Al)	2019/06/06		102	%	80 - 120
			Total Antimony (Sb)	2019/06/06		106	%	80 - 120
			Total Arsenic (As)	2019/06/06		101	%	80 - 120
			Total Barium (Ba)	2019/06/06		101	%	80 - 120
			Total Beryllium (Be)	2019/06/06		104	%	80 - 120
			Total Bismuth (Bi)	2019/06/06		102	%	80 - 120
			Total Boron (B)	2019/06/06		110	%	80 - 120
			Total Cadmium (Cd)	2019/06/06		99	%	80 - 120
			Total Calcium (Ca)	2019/06/06		108	%	80 - 120
			Total Chromium (Cr)	2019/06/06		101	%	80 - 120
			Total Cobalt (Co)	2019/06/06		103	%	80 - 120
			Total Copper (Cu)	2019/06/06		102	%	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 Iron (Fe)	2019/06/06		106	%	80 - 120
			Total Lead (Pb)	2019/06/06		103	%	80 - 120
			Total Magnesium (Mg)	2019/06/06		106	%	80 - 120
			Total Manganese (Mn)	2019/06/06		NC	%	80 - 120
			Total Molybdenum (Mo)	2019/06/06		109	%	80 - 120
			Total Nickel (Ni)	2019/06/06		102	%	80 - 120
			Total Phosphorus (P)	2019/06/06		108	%	80 - 120
			Total Potassium (K)	2019/06/06		106	%	80 - 120
			Total Selenium (Se)	2019/06/06		103	%	80 - 120
			Total Silver (Ag)	2019/06/06		99	%	80 - 120
			Total Sodium (Na)	2019/06/06		101	%	80 - 120
			Total Strontium (Sr)	2019/06/06		101	%	80 - 120
			Total Thallium (Tl)	2019/06/06		106	%	80 - 120
			Total Tin (Sn)	2019/06/06		105	%	80 - 120
			Total Titanium (Ti)	2019/06/06		101	%	80 - 120
			Total Uranium (U)	2019/06/06		109	%	80 - 120
			Total Vanadium (V)	2019/06/06		103	%	80 - 120
			Total Zirconium (Zr)	2019/06/06		109	%	80 - 120
			Total Zinc (Zn)	2019/06/06		100	%	80 - 120
6161382	AFM	Spiked Blank	Total Aluminum (Al)	2019/06/06		102	%	80 - 120
			Total Antimony (Sb)	2019/06/06		101	%	80 - 120
			Total Arsenic (As)	2019/06/06		102	%	80 - 120
			Total Barium (Ba)	2019/06/06		101	%	80 - 120
			Total Beryllium (Be)	2019/06/06		104	%	80 - 120
			Total Bismuth (Bi)	2019/06/06		103	%	80 - 120
			Total Boron (B)	2019/06/06		108	%	80 - 120
			Total Cadmium (Cd)	2019/06/06		97	%	80 - 120
			Total Calcium (Ca)	2019/06/06		108	%	80 - 120
			Total Chromium (Cr)	2019/06/06		103	%	80 - 120
			Total Cobalt (Co)	2019/06/06		103	%	80 - 120
			Total Copper (Cu)	2019/06/06		103	%	80 - 120
			Total Iron (Fe)	2019/06/06		107	%	80 - 120
			Total Lead (Pb)	2019/06/06		103	%	80 - 120
			Total Magnesium (Mg)	2019/06/06		108	%	80 - 120
			Total Manganese (Mn)	2019/06/06		104	%	80 - 120
			Total Molybdenum (Mo)	2019/06/06		104	%	80 - 120
			Total Nickel (Ni)	2019/06/06		104	%	80 - 120
			Total Phosphorus (P)	2019/06/06		109	%	80 - 120
			Total Potassium (K)	2019/06/06		108	%	80 - 120
			Total Selenium (Se)	2019/06/06		102	%	80 - 120
			Total Silver (Ag)	2019/06/06		97	%	80 - 120
			Total Sodium (Na)	2019/06/06		104	%	80 - 120
			Total Strontium (Sr)	2019/06/06		105	%	80 - 120
			Total Thallium (Tl)	2019/06/06		106	%	80 - 120
			Total Tin (Sn)	2019/06/06		105	%	80 - 120
			Total Titanium (Ti)	2019/06/06		102	%	80 - 120
			Total Uranium (U)	2019/06/06		108	%	80 - 120
			Total Vanadium (V)	2019/06/06		105	%	80 - 120
			Total Zirconium (Zr)	2019/06/06		107	%	80 - 120
			Total Zinc (Zn)	2019/06/06		104	%	80 - 120
6161382	AFM	Method Blank	Total Aluminum (Al)	2019/06/06	<5.0		ug/L	
			Total Antimony (Sb)	2019/06/06	<1.0		ug/L	
			Total Arsenic (As)	2019/06/06	<1.0		ug/L	
			Total Barium (Ba)	2019/06/06	<1.0		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
			Total Beryllium (Be)	2019/06/06	<1.0		ug/L	
			Total Bismuth (Bi)	2019/06/06	<2.0		ug/L	
			Total Boron (B)	2019/06/06	<50		ug/L	
			Total Cadmium (Cd)	2019/06/06	<0.010		ug/L	
			Total Calcium (Ca)	2019/06/06	<100		ug/L	
			Total Chromium (Cr)	2019/06/06	<1.0		ug/L	
			Total Cobalt (Co)	2019/06/06	<0.40		ug/L	
			Total Copper (Cu)	2019/06/06	<0.50		ug/L	
			Total Iron (Fe)	2019/06/06	<50		ug/L	
			Total Lead (Pb)	2019/06/06	<0.50		ug/L	
			Total Magnesium (Mg)	2019/06/06	<100		ug/L	
			Total Manganese (Mn)	2019/06/06	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/06/06	<2.0		ug/L	
			Total Nickel (Ni)	2019/06/06	<2.0		ug/L	
			Total Phosphorus (P)	2019/06/06	<100		ug/L	
			Total Potassium (K)	2019/06/06	<100		ug/L	
			Total Selenium (Se)	2019/06/06	<1.0		ug/L	
			Total Silver (Ag)	2019/06/06	<0.10		ug/L	
			Total Sodium (Na)	2019/06/06	<100		ug/L	
			Total Strontium (Sr)	2019/06/06	<2.0		ug/L	
			Total Thallium (Tl)	2019/06/06	<0.10		ug/L	
			Total Tin (Sn)	2019/06/06	<2.0		ug/L	
			Total Titanium (Ti)	2019/06/06	<2.0		ug/L	
			Total Uranium (U)	2019/06/06	<0.10		ug/L	
			Total Vanadium (V)	2019/06/06	<2.0		ug/L	
			Total Zirconium (Zr)	2019/06/06	<2.0		ug/L	
			Total Zinc (Zn)	2019/06/06	<5.0		ug/L	
6161382	AFM	RPD	Total Arsenic (As)	2019/06/06	NC		%	20
			Total Uranium (U)	2019/06/06	NC		%	20
6161399	BAN	Matrix Spike	Total Aluminum (Al)	2019/06/06		100	%	80 - 120
			Total Antimony (Sb)	2019/06/06		104	%	80 - 120
			Total Arsenic (As)	2019/06/06		101	%	80 - 120
			Total Barium (Ba)	2019/06/06		98	%	80 - 120
			Total Beryllium (Be)	2019/06/06		104	%	80 - 120
			Total Bismuth (Bi)	2019/06/06		99	%	80 - 120
			Total Boron (B)	2019/06/06		85	%	80 - 120
			Total Cadmium (Cd)	2019/06/06		98	%	80 - 120
			Total Calcium (Ca)	2019/06/06		105	%	80 - 120
			Total Chromium (Cr)	2019/06/06		102	%	80 - 120
			Total Cobalt (Co)	2019/06/06		102	%	80 - 120
			Total Copper (Cu)	2019/06/06		101	%	80 - 120
			Total Iron (Fe)	2019/06/06		104	%	80 - 120
			Total Lead (Pb)	2019/06/06		101	%	80 - 120
			Total Magnesium (Mg)	2019/06/06		107	%	80 - 120
			Total Manganese (Mn)	2019/06/06		101	%	80 - 120
			Total Molybdenum (Mo)	2019/06/06		106	%	80 - 120
			Total Nickel (Ni)	2019/06/06		102	%	80 - 120
			Total Phosphorus (P)	2019/06/06		108	%	80 - 120
			Total Potassium (K)	2019/06/06		NC	%	80 - 120
			Total Selenium (Se)	2019/06/06		101	%	80 - 120
			Total Silver (Ag)	2019/06/06		98	%	80 - 120
			Total Sodium (Na)	2019/06/06		NC	%	80 - 120
			Total Strontium (Sr)	2019/06/06		NC	%	80 - 120
			Total Thallium (Tl)	2019/06/06		104	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6161399	BAN	Spiked Blank	Total Tin (Sn)	2019/06/06		104	%	80 - 120
			Total Titanium (Ti)	2019/06/06		101	%	80 - 120
			Total Uranium (U)	2019/06/06		107	%	80 - 120
			Total Vanadium (V)	2019/06/06		102	%	80 - 120
			Total Zirconium (Zr)	2019/06/06		110	%	80 - 120
			Total Zinc (Zn)	2019/06/06		101	%	80 - 120
			Total Aluminum (Al)	2019/06/06		101	%	80 - 120
			Total Antimony (Sb)	2019/06/06		100	%	80 - 120
			Total Arsenic (As)	2019/06/06		100	%	80 - 120
			Total Barium (Ba)	2019/06/06		99	%	80 - 120
			Total Beryllium (Be)	2019/06/06		102	%	80 - 120
			Total Bismuth (Bi)	2019/06/06		100	%	80 - 120
			Total Boron (B)	2019/06/06		107	%	80 - 120
			Total Cadmium (Cd)	2019/06/06		95	%	80 - 120
			Total Calcium (Ca)	2019/06/06		106	%	80 - 120
			Total Chromium (Cr)	2019/06/06		102	%	80 - 120
			Total Cobalt (Co)	2019/06/06		103	%	80 - 120
			Total Copper (Cu)	2019/06/06		102	%	80 - 120
			Total Iron (Fe)	2019/06/06		105	%	80 - 120
			Total Lead (Pb)	2019/06/06		101	%	80 - 120
			Total Magnesium (Mg)	2019/06/06		108	%	80 - 120
			Total Manganese (Mn)	2019/06/06		103	%	80 - 120
			Total Molybdenum (Mo)	2019/06/06		103	%	80 - 120
			Total Nickel (Ni)	2019/06/06		104	%	80 - 120
			Total Phosphorus (P)	2019/06/06		106	%	80 - 120
			Total Potassium (K)	2019/06/06		105	%	80 - 120
			Total Selenium (Se)	2019/06/06		102	%	80 - 120
			Total Silver (Ag)	2019/06/06		95	%	80 - 120
			Total Sodium (Na)	2019/06/06		105	%	80 - 120
			Total Strontium (Sr)	2019/06/06		101	%	80 - 120
			Total Thallium (Tl)	2019/06/06		104	%	80 - 120
			Total Tin (Sn)	2019/06/06		101	%	80 - 120
Total Titanium (Ti)	2019/06/06		104	%	80 - 120			
Total Uranium (U)	2019/06/06		106	%	80 - 120			
Total Vanadium (V)	2019/06/06		103	%	80 - 120			
Total Zirconium (Zr)	2019/06/06		106	%	80 - 120			
Total Zinc (Zn)	2019/06/06		101	%	80 - 120			
6161399	BAN	Method Blank	Total Aluminum (Al)	2019/06/06	<5.0		ug/L	
			Total Antimony (Sb)	2019/06/06	<1.0		ug/L	
			Total Arsenic (As)	2019/06/06	<1.0		ug/L	
			Total Barium (Ba)	2019/06/06	<1.0		ug/L	
			Total Beryllium (Be)	2019/06/06	<1.0		ug/L	
			Total Bismuth (Bi)	2019/06/06	<2.0		ug/L	
			Total Boron (B)	2019/06/06	<50		ug/L	
			Total Cadmium (Cd)	2019/06/06	<0.010		ug/L	
			Total Calcium (Ca)	2019/06/06	<100		ug/L	
			Total Chromium (Cr)	2019/06/06	<1.0		ug/L	
			Total Cobalt (Co)	2019/06/06	<0.40		ug/L	
			Total Copper (Cu)	2019/06/06	<0.50		ug/L	
			Total Iron (Fe)	2019/06/06	<50		ug/L	
			Total Lead (Pb)	2019/06/06	<0.50		ug/L	
			Total Magnesium (Mg)	2019/06/06	<100		ug/L	
			Total Manganese (Mn)	2019/06/06	<2.0		ug/L	
Total Molybdenum (Mo)	2019/06/06	<2.0		ug/L				



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Nickel (Ni)	2019/06/06	<2.0		ug/L	
			Total Phosphorus (P)	2019/06/06	<100		ug/L	
			Total Potassium (K)	2019/06/06	<100		ug/L	
			Total Selenium (Se)	2019/06/06	<1.0		ug/L	
			Total Silver (Ag)	2019/06/06	<0.10		ug/L	
			Total Sodium (Na)	2019/06/06	<100		ug/L	
			Total Strontium (Sr)	2019/06/06	<2.0		ug/L	
			Total Thallium (Tl)	2019/06/06	<0.10		ug/L	
			Total Tin (Sn)	2019/06/06	<2.0		ug/L	
			Total Titanium (Ti)	2019/06/06	<2.0		ug/L	
			Total Uranium (U)	2019/06/06	<0.10		ug/L	
			Total Vanadium (V)	2019/06/06	<2.0		ug/L	
			Total Zirconium (Zr)	2019/06/06	<2.0		ug/L	
			Total Zinc (Zn)	2019/06/06	<5.0		ug/L	
6161399	BAN	RPD	Total Aluminum (Al)	2019/06/06	4.4		%	20
6161486	SSI	Matrix Spike	Dissolved Organic Carbon (C)	2019/06/06		94	%	85 - 115
6161486	SSI	Spiked Blank	Dissolved Organic Carbon (C)	2019/06/06		100	%	80 - 120
6161486	SSI	Method Blank	Dissolved Organic Carbon (C)	2019/06/06	<0.5		mg/L	
6161486	SSI	RPD	Dissolved Organic Carbon (C)	2019/06/06	10		%	15
6161500	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/06		99	%	85 - 115
6161500	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/06		104	%	80 - 120
6161500	SSI	Method Blank	Total Organic Carbon (C)	2019/06/06	<0.50		mg/L	
6161500	SSI	RPD	Total Organic Carbon (C)	2019/06/06	7.2		%	15
6161502	SSI	Matrix Spike [JWW877-07]	Total Organic Carbon (C)	2019/06/06		99	%	85 - 115
6161502	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/06		103	%	80 - 120
6161502	SSI	Method Blank	Total Organic Carbon (C)	2019/06/06	<0.50		mg/L	
6161502	SSI	RPD [JWW877-07]	Total Organic Carbon (C)	2019/06/06	1.8		%	15
6161589	EMT	QC Standard	pH	2019/06/07		101	%	97 - 103
6161589	EMT	RPD	pH	2019/06/07	1.1		%	N/A
6161594	EMT	Spiked Blank	Conductivity	2019/06/07		104	%	80 - 120
6161594	EMT	Method Blank	Conductivity	2019/06/07	<1.0		uS/cm	
6161594	EMT	RPD	Conductivity	2019/06/07	0.15		%	10
6161614	EMT	Matrix Spike	Dissolved Fluoride (F-)	2019/06/07		53 (1)	%	80 - 120
6161614	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/07		95	%	80 - 120
6161614	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/07	<0.10		mg/L	
6161614	EMT	RPD	Dissolved Fluoride (F-)	2019/06/07	NC		%	20
6161620	EMT	QC Standard	pH	2019/06/07		101	%	97 - 103
6161620	EMT	RPD	pH	2019/06/07	0.75		%	N/A
6161624	EMT	Spiked Blank	Conductivity	2019/06/07		100	%	80 - 120
6161624	EMT	Method Blank	Conductivity	2019/06/07	<1.0		uS/cm	
6161624	EMT	RPD	Conductivity	2019/06/07	0.85		%	10
6161633	EMT	QC Standard	pH	2019/06/07		101	%	97 - 103
6161633	EMT	RPD	pH	2019/06/07	0.71		%	N/A
6161639	EMT	Spiked Blank	Conductivity	2019/06/07		99	%	80 - 120
6161639	EMT	Method Blank	Conductivity	2019/06/07	<1.0		uS/cm	
6161639	EMT	RPD	Conductivity	2019/06/07	0.49		%	10
6161902	NRG	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/06/07		117	%	80 - 120
6161902	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07		108	%	80 - 120
6161902	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07	<0.050		mg/L	
6161902	NRG	RPD	Nitrogen (Ammonia Nitrogen)	2019/06/07	NC		%	20
6161921	MLB	Matrix Spike	Dissolved Aluminum (Al)	2019/06/06		98	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/06		95	%	80 - 120
			Dissolved Arsenic (As)	2019/06/06		100	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Barium (Ba)	2019/06/06		NC	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/06		104	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/06		97	%	80 - 120
			Dissolved Boron (B)	2019/06/06		105	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/06		98	%	80 - 120
			Dissolved Calcium (Ca)	2019/06/06		NC	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/06		98	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/06		98	%	80 - 120
			Dissolved Copper (Cu)	2019/06/06		98	%	80 - 120
			Dissolved Iron (Fe)	2019/06/06		99	%	80 - 120
			Dissolved Lead (Pb)	2019/06/06		99	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/06		95	%	80 - 120
			Dissolved Manganese (Mn)	2019/06/06		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/06		102	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/06		97	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/06		102	%	80 - 120
			Dissolved Potassium (K)	2019/06/06		99	%	80 - 120
			Dissolved Selenium (Se)	2019/06/06		99	%	80 - 120
			Dissolved Silver (Ag)	2019/06/06		92	%	80 - 120
			Dissolved Sodium (Na)	2019/06/06		95	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/06		NC	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/06		100	%	80 - 120
			Dissolved Tin (Sn)	2019/06/06		102	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/06		99	%	80 - 120
			Dissolved Uranium (U)	2019/06/06		105	%	80 - 120
			Dissolved Vanadium (V)	2019/06/06		100	%	80 - 120
			Dissolved Zirconium (Zr)	2019/06/06		108	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/06		97	%	80 - 120
6161921	MLB	Spiked Blank	Dissolved Aluminum (Al)	2019/06/06		97	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/06		91	%	80 - 120
			Dissolved Arsenic (As)	2019/06/06		99	%	80 - 120
			Dissolved Barium (Ba)	2019/06/06		98	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/06		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/06		97	%	80 - 120
			Dissolved Boron (B)	2019/06/06		105	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/06		97	%	80 - 120
			Dissolved Calcium (Ca)	2019/06/06		99	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/06		100	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/06		99	%	80 - 120
			Dissolved Copper (Cu)	2019/06/06		100	%	80 - 120
			Dissolved Iron (Fe)	2019/06/06		101	%	80 - 120
			Dissolved Lead (Pb)	2019/06/06		99	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/06		104	%	80 - 120
			Dissolved Manganese (Mn)	2019/06/06		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/06		101	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/06		100	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/06		104	%	80 - 120
			Dissolved Potassium (K)	2019/06/06		103	%	80 - 120
			Dissolved Selenium (Se)	2019/06/06		98	%	80 - 120
			Dissolved Silver (Ag)	2019/06/06		95	%	80 - 120
			Dissolved Sodium (Na)	2019/06/06		99	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/06		98	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/06		101	%	80 - 120
			Dissolved Tin (Sn)	2019/06/06		100	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Titanium (Ti)	2019/06/06		102	%	80 - 120
			Dissolved Uranium (U)	2019/06/06		104	%	80 - 120
			Dissolved Vanadium (V)	2019/06/06		99	%	80 - 120
			Dissolved Zirconium (Zr)	2019/06/06		104	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/06		101	%	80 - 120
6161921	MLB	Method Blank	Dissolved Aluminum (Al)	2019/06/06	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/06/06	<1.0		ug/L	
			Dissolved Arsenic (As)	2019/06/06	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/06/06	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/06/06	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/06/06	<2.0		ug/L	
			Dissolved Boron (B)	2019/06/06	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/06/06	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/06/06	<100		ug/L	
			Dissolved Chromium (Cr)	2019/06/06	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/06/06	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/06/06	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/06/06	<50		ug/L	
			Dissolved Lead (Pb)	2019/06/06	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/06/06	<100		ug/L	
			Dissolved Manganese (Mn)	2019/06/06	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/06/06	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/06/06	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/06/06	<100		ug/L	
			Dissolved Potassium (K)	2019/06/06	<100		ug/L	
			Dissolved Selenium (Se)	2019/06/06	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/06/06	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/06/06	<100		ug/L	
			Dissolved Strontium (Sr)	2019/06/06	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/06/06	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/06/06	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/06/06	<2.0		ug/L	
			Dissolved Uranium (U)	2019/06/06	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/06/06	<2.0		ug/L	
			Dissolved Zirconium (Zr)	2019/06/06	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/06/06	<5.0		ug/L	
6161921	MLB	RPD	Dissolved Lead (Pb)	2019/06/06	0.77		%	20
6161936	AM6	QC Standard	Total Dissolved Solids	2019/06/07		96	%	80 - 120
6161936	AM6	Method Blank	Total Dissolved Solids	2019/06/07	<10		mg/L	
6161936	AM6	RPD	Total Dissolved Solids	2019/06/07	18		%	25
6163101	ADA	Matrix Spike	Dissolved Tungsten (W)	2019/06/07		106	%	80 - 120
6163101	ADA	Spiked Blank	Dissolved Tungsten (W)	2019/06/07		102	%	80 - 120
6163101	ADA	Method Blank	Dissolved Tungsten (W)	2019/06/07	<1.0		ug/L	
6163754	EMT	QC Standard	Turbidity	2019/06/07		113	%	80 - 120
6163754	EMT	Spiked Blank	Turbidity	2019/06/07		98	%	80 - 120
6163754	EMT	Method Blank	Turbidity	2019/06/07	<0.10		NTU	
6163754	EMT	RPD	Turbidity	2019/06/07	11		%	20
6163756	EMT	QC Standard	Turbidity	2019/06/07		113	%	80 - 120
6163756	EMT	Spiked Blank	Turbidity	2019/06/07		98	%	80 - 120
6163756	EMT	Method Blank	Turbidity	2019/06/07	<0.10		NTU	
6163756	EMT	RPD	Turbidity	2019/06/07	7.4		%	20
6163938	KMC	Matrix Spike	Total Organic Carbon (C)	2019/06/07		98	%	85 - 115
6163938	KMC	Spiked Blank	Total Organic Carbon (C)	2019/06/07		99	%	80 - 120
6163938	KMC	Method Blank	Total Organic Carbon (C)	2019/06/07	<0.50		mg/L	



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6163938	KMC	RPD	Total Organic Carbon (C)	2019/06/07	3.7		%	15
6163986	EMT	QC Standard	pH	2019/06/07		101	%	97 - 103
6163986	EMT	RPD [JWV274-04]	pH	2019/06/07	8.0 (2)		%	N/A
6163987	EMT	Spiked Blank	Conductivity	2019/06/07		100	%	80 - 120
6163987	EMT	Method Blank	Conductivity	2019/06/07	<1.0		uS/cm	
6163987	EMT	RPD [JWV274-04]	Conductivity	2019/06/07	1.5		%	10
6163989	EMT	Matrix Spike [JWV274-04]	Dissolved Fluoride (F-)	2019/06/07		94	%	80 - 120
6163989	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/07		98	%	80 - 120
6163989	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/07	<0.10		mg/L	
6163989	EMT	RPD [JWV274-04]	Dissolved Fluoride (F-)	2019/06/07	NC		%	20
6164116	EMT	QC Standard	pH	2019/06/10		101	%	97 - 103
6164116	EMT	RPD	pH	2019/06/10	0.95		%	N/A
6164134	EMT	Spiked Blank	Conductivity	2019/06/10		102	%	80 - 120
6164134	EMT	Method Blank	Conductivity	2019/06/10	<1.0		uS/cm	
6164134	EMT	RPD	Conductivity	2019/06/10	0.10		%	10
6164136	EMT	Matrix Spike	Dissolved Fluoride (F-)	2019/06/10		99	%	80 - 120
6164136	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/10		97	%	80 - 120
6164136	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/10	<0.10		mg/L	
6164136	EMT	RPD	Dissolved Fluoride (F-)	2019/06/10	NC		%	20
6164137	EMT	QC Standard	pH	2019/06/10		101	%	97 - 103
6164137	EMT	RPD	pH	2019/06/10	0.71		%	N/A
6164141	EMT	Spiked Blank	Conductivity	2019/06/10		102	%	80 - 120
6164141	EMT	Method Blank	Conductivity	2019/06/10	<1.0		uS/cm	
6164141	EMT	RPD	Conductivity	2019/06/10	0.00016		%	10
6164157	BKE	Matrix Spike	Total Cyanide (CN)	2019/06/08		96	%	80 - 120
6164157	BKE	Spiked Blank	Total Cyanide (CN)	2019/06/08		100	%	80 - 120
6164157	BKE	Method Blank	Total Cyanide (CN)	2019/06/08	<0.0050		mg/L	
6164157	BKE	RPD	Total Cyanide (CN)	2019/06/08	3.0		%	20
6164168	BKE	Matrix Spike [JWW879-12]	Total Cyanide (CN)	2019/06/08		98	%	80 - 120
6164168	BKE	Spiked Blank	Total Cyanide (CN)	2019/06/08		100	%	80 - 120
6164168	BKE	Method Blank	Total Cyanide (CN)	2019/06/08	<0.0050		mg/L	
6164168	BKE	RPD [JWW879-12]	Total Cyanide (CN)	2019/06/08	NC		%	20
6164184	LHA	Matrix Spike	Total Cyanide (CN)	2019/06/10		94	%	80 - 120
6164184	LHA	Spiked Blank	Total Cyanide (CN)	2019/06/10		97	%	80 - 120
6164184	LHA	Method Blank	Total Cyanide (CN)	2019/06/10	<0.0050		mg/L	
6164184	LHA	RPD	Total Cyanide (CN)	2019/06/10	NC		%	20
6167285	SRM	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/06/11		101	%	80 - 120
6167285	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/11		112	%	80 - 120
6167285	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/11	<5.0		mg/L	
6167285	SRM	RPD	Total Alkalinity (Total as CaCO3)	2019/06/11	5.0		%	25
6167288	SRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/06/10		101	%	80 - 120
6167288	SRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/06/10		103	%	80 - 120
6167288	SRM	Method Blank	Dissolved Chloride (Cl-)	2019/06/10	<1.0		mg/L	
6167288	SRM	RPD	Dissolved Chloride (Cl-)	2019/06/10	0.68		%	25
6167290	SRM	Matrix Spike	Dissolved Sulphate (SO4)	2019/06/10		103	%	80 - 120
6167290	SRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/06/10		103	%	80 - 120
6167290	SRM	Method Blank	Dissolved Sulphate (SO4)	2019/06/10	<2.0		mg/L	
6167290	SRM	RPD	Dissolved Sulphate (SO4)	2019/06/10	1.2		%	25
6167291	SRM	Matrix Spike	Reactive Silica (SiO2)	2019/06/11		100	%	80 - 120
6167291	SRM	Spiked Blank	Reactive Silica (SiO2)	2019/06/11		102	%	80 - 120
6167291	SRM	Method Blank	Reactive Silica (SiO2)	2019/06/11	<0.50		mg/L	
6167291	SRM	RPD	Reactive Silica (SiO2)	2019/06/11	1.1		%	25
6167293	SRM	Matrix Spike	Orthophosphate (P)	2019/06/11		NC	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6167293	SRM	Spiked Blank	Orthophosphate (P)	2019/06/11		96	%	80 - 120
6167293	SRM	Method Blank	Orthophosphate (P)	2019/06/11	<0.010		mg/L	
6167293	SRM	RPD	Orthophosphate (P)	2019/06/11	0.68		%	25
6167294	SRM	Matrix Spike	Nitrate + Nitrite (N)	2019/06/10		100	%	80 - 120
6167294	SRM	Spiked Blank	Nitrate + Nitrite (N)	2019/06/10		107	%	80 - 120
6167294	SRM	Method Blank	Nitrate + Nitrite (N)	2019/06/10	<0.050		mg/L	
6167294	SRM	RPD	Nitrate + Nitrite (N)	2019/06/10	NC		%	25
6167295	SRM	Matrix Spike	Nitrite (N)	2019/06/10		96	%	80 - 120
6167295	SRM	Spiked Blank	Nitrite (N)	2019/06/10		98	%	80 - 120
6167295	SRM	Method Blank	Nitrite (N)	2019/06/10	<0.010		mg/L	
6167295	SRM	RPD	Nitrite (N)	2019/06/10	NC		%	20
6167297	SRM	Matrix Spike [JWV275-01]	Total Alkalinity (Total as CaCO3)	2019/06/11		103	%	80 - 120
6167297	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/11		113	%	80 - 120
6167297	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/11	<5.0		mg/L	
6167297	SRM	RPD [JWV275-01]	Total Alkalinity (Total as CaCO3)	2019/06/11	NC		%	25
6167300	SRM	Matrix Spike [JWV275-01]	Dissolved Chloride (Cl-)	2019/06/10		101	%	80 - 120
6167300	SRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/06/10		103	%	80 - 120
6167300	SRM	Method Blank	Dissolved Chloride (Cl-)	2019/06/10	<1.0		mg/L	
6167300	SRM	RPD [JWV275-01]	Dissolved Chloride (Cl-)	2019/06/10	0.81		%	25
6167301	SRM	Matrix Spike [JWV275-01]	Dissolved Sulphate (SO4)	2019/06/10		103	%	80 - 120
6167301	SRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/06/10		102	%	80 - 120
6167301	SRM	Method Blank	Dissolved Sulphate (SO4)	2019/06/10	<2.0		mg/L	
6167301	SRM	RPD [JWV275-01]	Dissolved Sulphate (SO4)	2019/06/10	NC		%	25
6167303	SRM	Matrix Spike [JWV275-01]	Reactive Silica (SiO2)	2019/06/11		102	%	80 - 120
6167303	SRM	Spiked Blank	Reactive Silica (SiO2)	2019/06/11		103	%	80 - 120
6167303	SRM	Method Blank	Reactive Silica (SiO2)	2019/06/11	<0.50		mg/L	
6167303	SRM	RPD [JWV275-01]	Reactive Silica (SiO2)	2019/06/11	3.8		%	25
6167304	SRM	Matrix Spike [JWV275-01]	Orthophosphate (P)	2019/06/11		98	%	80 - 120
6167304	SRM	Spiked Blank	Orthophosphate (P)	2019/06/11		102	%	80 - 120
6167304	SRM	Method Blank	Orthophosphate (P)	2019/06/11	<0.010		mg/L	
6167304	SRM	RPD [JWV275-01]	Orthophosphate (P)	2019/06/11	NC		%	25
6167305	SRM	Matrix Spike [JWV275-01]	Nitrate + Nitrite (N)	2019/06/10		99	%	80 - 120
6167305	SRM	Spiked Blank	Nitrate + Nitrite (N)	2019/06/10		104	%	80 - 120
6167305	SRM	Method Blank	Nitrate + Nitrite (N)	2019/06/10	<0.050		mg/L	
6167305	SRM	RPD [JWV275-01]	Nitrate + Nitrite (N)	2019/06/10	NC		%	25
6167306	SRM	Matrix Spike [JWV275-01]	Nitrite (N)	2019/06/10		94	%	80 - 120
6167306	SRM	Spiked Blank	Nitrite (N)	2019/06/10		99	%	80 - 120
6167306	SRM	Method Blank	Nitrite (N)	2019/06/10	<0.010		mg/L	
6167306	SRM	RPD [JWV275-01]	Nitrite (N)	2019/06/10	NC		%	20
6167410	MLB	Matrix Spike	Dissolved Aluminum (Al)	2019/06/11		101	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/11		97	%	80 - 120
			Dissolved Arsenic (As)	2019/06/11		97	%	80 - 120
			Dissolved Barium (Ba)	2019/06/11		100	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
			Dissolved Boron (B)	2019/06/11		104	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/11		98	%	80 - 120
			Dissolved Calcium (Ca)	2019/06/11		100	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/11		97	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/11		98	%	80 - 120
			Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
			Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
			Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/11		106	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/11		98	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/11		98	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/11		104	%	80 - 120
			Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
			Dissolved Selenium (Se)	2019/06/11		96	%	80 - 120
			Dissolved Silver (Ag)	2019/06/11		96	%	80 - 120
			Dissolved Sodium (Na)	2019/06/11		101	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/11		101	%	80 - 120
			Dissolved Tin (Sn)	2019/06/11		98	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/11		100	%	80 - 120
			Dissolved Uranium (U)	2019/06/11		103	%	80 - 120
			Dissolved Vanadium (V)	2019/06/11		101	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/11		99	%	80 - 120
6167410	MLB	Spiked Blank	Dissolved Aluminum (Al)	2019/06/11		102	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/11		96	%	80 - 120
			Dissolved Arsenic (As)	2019/06/11		96	%	80 - 120
			Dissolved Barium (Ba)	2019/06/11		99	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
			Dissolved Boron (B)	2019/06/11		107	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/11		97	%	80 - 120
			Dissolved Calcium (Ca)	2019/06/11		99	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/11		95	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/11		96	%	80 - 120
			Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
			Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
			Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/11		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/11		102	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/11		96	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/11		103	%	80 - 120
			Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
			Dissolved Selenium (Se)	2019/06/11		97	%	80 - 120
			Dissolved Silver (Ag)	2019/06/11		97	%	80 - 120
			Dissolved Sodium (Na)	2019/06/11		97	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/11		102	%	80 - 120
			Dissolved Tin (Sn)	2019/06/11		99	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/11		102	%	80 - 120
			Dissolved Uranium (U)	2019/06/11		103	%	80 - 120
			Dissolved Vanadium (V)	2019/06/11		100	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/11		98	%	80 - 120
6167410	MLB	Method Blank	Dissolved Aluminum (Al)	2019/06/11	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/06/11	<1.0		ug/L	
			Dissolved Arsenic (As)	2019/06/11	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/06/11	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/06/11	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/06/11	<2.0		ug/L	
			Dissolved Boron (B)	2019/06/11	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/06/11	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/06/11	<100		ug/L	



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Chromium (Cr)	2019/06/11	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/06/11	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/06/11	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/06/11	<50		ug/L	
			Dissolved Lead (Pb)	2019/06/11	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/06/11	<100		ug/L	
			Dissolved Manganese (Mn)	2019/06/11	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/06/11	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/06/11	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/06/11	<100		ug/L	
			Dissolved Potassium (K)	2019/06/11	<100		ug/L	
			Dissolved Selenium (Se)	2019/06/11	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/06/11	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/06/11	<100		ug/L	
			Dissolved Strontium (Sr)	2019/06/11	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/06/11	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/06/11	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/06/11	<2.0		ug/L	
			Dissolved Uranium (U)	2019/06/11	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/06/11	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/06/11	<5.0		ug/L	
6167410	MLB	RPD	Dissolved Aluminum (Al)	2019/06/11	NC		%	20
			Dissolved Antimony (Sb)	2019/06/11	NC		%	20
			Dissolved Arsenic (As)	2019/06/11	NC		%	20
			Dissolved Barium (Ba)	2019/06/11	NC		%	20
			Dissolved Beryllium (Be)	2019/06/11	NC		%	20
			Dissolved Bismuth (Bi)	2019/06/11	NC		%	20
			Dissolved Boron (B)	2019/06/11	NC		%	20
			Dissolved Cadmium (Cd)	2019/06/11	NC		%	20
			Dissolved Calcium (Ca)	2019/06/11	NC		%	20
			Dissolved Chromium (Cr)	2019/06/11	NC		%	20
			Dissolved Cobalt (Co)	2019/06/11	NC		%	20
			Dissolved Copper (Cu)	2019/06/11	NC		%	20
			Dissolved Iron (Fe)	2019/06/11	NC		%	20
			Dissolved Lead (Pb)	2019/06/11	NC		%	20
			Dissolved Magnesium (Mg)	2019/06/11	NC		%	20
			Dissolved Manganese (Mn)	2019/06/11	NC		%	20
			Dissolved Molybdenum (Mo)	2019/06/11	NC		%	20
			Dissolved Nickel (Ni)	2019/06/11	NC		%	20
			Dissolved Phosphorus (P)	2019/06/11	NC		%	20
			Dissolved Potassium (K)	2019/06/11	NC		%	20
			Dissolved Selenium (Se)	2019/06/11	NC		%	20
			Dissolved Silver (Ag)	2019/06/11	NC		%	20
			Dissolved Sodium (Na)	2019/06/11	NC		%	20
			Dissolved Strontium (Sr)	2019/06/11	NC		%	20
			Dissolved Thallium (Tl)	2019/06/11	NC		%	20
			Dissolved Tin (Sn)	2019/06/11	NC		%	20
			Dissolved Titanium (Ti)	2019/06/11	NC		%	20
			Dissolved Uranium (U)	2019/06/11	NC		%	20
			Dissolved Vanadium (V)	2019/06/11	NC		%	20
			Dissolved Zinc (Zn)	2019/06/11	NC		%	20
6167479	SSI	Matrix Spike	Dissolved Organic Carbon (C)	2019/06/10		89	%	85 - 115
6167479	SSI	Spiked Blank	Dissolved Organic Carbon (C)	2019/06/10		95	%	80 - 120
6167479	SSI	Method Blank	Dissolved Organic Carbon (C)	2019/06/10	<0.5		mg/L	



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6167479	SSI	RPD	Dissolved Organic Carbon (C)	2019/06/10	11		%	15
6170572	SHC	Spiked Blank	Radium-226	2019/06/20		110	%	85 - 115
6170572	SHC	Method Blank	Radium-226	2019/06/20	<0.010		Bq/L	
6170572	SHC	RPD [JWV274-01]	Radium-226	2019/06/20	NC		%	N/A
6172376	PBA	Matrix Spike [JWW877-08]	Total Tungsten (W)	2019/06/12		103	%	80 - 120
6172376	PBA	Spiked Blank	Total Tungsten (W)	2019/06/12		100	%	80 - 120
6172376	PBA	Method Blank	Total Tungsten (W)	2019/06/12	<1.0		ug/L	
6172376	PBA	RPD [JWW877-08]	Total Tungsten (W)	2019/06/12	NC		%	20
6174090	BBD	Matrix Spike [JWV276-13]	Acidity	2019/06/13		103	%	80 - 120
6174090	BBD	Spiked Blank	Acidity	2019/06/13		102	%	80 - 120
6174090	BBD	Method Blank	Acidity	2019/06/13	<5.0		mg/L	
6174090	BBD	RPD [JWV274-13]	Acidity	2019/06/13	NC		%	25
6192958	éFQ	Spiked Blank	WAD Cyanide (Free)	2019/06/16		97	%	80 - 120
6192958	éFQ	Method Blank	WAD Cyanide (Free)	2019/06/16	<0.0030		mg/L	
6192958	éFQ	RPD	WAD Cyanide (Free)	2019/06/16	1.8		%	25
6192962	éFQ	Spiked Blank	WAD Cyanide (Free)	2019/06/16		94	%	80 - 120
6192962	éFQ	Method Blank	WAD Cyanide (Free)	2019/06/16	<0.0030		mg/L	

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.

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) Poor Spike recovery due to sample matrix interference.

(2) Poor duplicate agreement due to matrix interferences.



BUREAU
VERITAS

BV Labs Job #: B9E9646
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

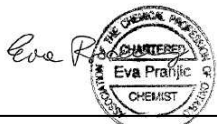


Caroline Bougie

Caroline Bougie, B.Sc. Chemist

Eric Dearman

Eric Dearman, Scientific Specialist



Ewa Pranjic

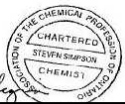
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Gina Thompson

Gina Thompson, Inorganics General Chemistry Supervisor

Mike Mac Gillivray

Mike MacGillivray, Scientific Specialist (Inorganics)



Steven Simpson

Steven Simpson, Lab Director

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**DALHOUSIE
UNIVERSITY**

Inspiring Minds

Department of Oceanography
1355 Oxford St
Halifax, NS
B3H 4R2

Determination of chlorophyll a by fluorescence

Client: Bureau Veritas Laboratories, 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Received: 2019-06-05

Project #: B9E9646

Completed: 2019-06-10

Hugh MacIntyre

Hugh MacIntyre, Ph.D.

Chl *a* (chlorophyll *a*; $\mu\text{g L}^{-1}$) determined by the acidification method (Holm-Hansen et al., 1965). Estimates made with the non-acidification method (Welschmeyer, 1994) are shown for comparison.

The non-acidification method is considered more reliable than the acidification method in correcting for bias due to the contributions of chlorophyll *b* and chlorophyll degradation products.

Holm-Hansen O, Lorenzen CJ, Holmes RW, Strickland JDH (1965) Fluorometric determination of chlorophyll.

J Conseil 30:3-15

Welschmeyer NA (1994) Fluorometric analysis of chlorophyll *a* in the presence of chlorophyll *b* and phaeopigments.

Limnol Oceanogr 39:1985-1992

Contractor ID	Client ID	Chl <i>a</i> (acidification)	Chl <i>a</i> (non-acidification)
JWV274-02R	SW 2	2.97	2.77
JWV276-02R	SW 3	0.853	0.64
JWV278-02R	SW 6	1.8	1.63
JWV280-02R	SW 7	0.345	0.309
JWV282-02R	SW 10	1.82	1.86
JWW871-02R	SW 11	2.38	2.2
JWW873-02R	SW 12	2.54	2.42
JWW875-02R	SW 14	1.11	1.18

Contractor ID	Client ID	Chl <i>a</i> (acidification)	Chl <i>a</i> (non-acidification)
JWW877-02R	FMS DUP 1	0.943	0.928
JWW879-02R	FIELD/FILTER BLANK 1	0.044	0.006



Maxxam Analytics International Corporation o/a Maxxam Analytics
200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel: (902) 420-0203 Toll-free 800-563-6266 Fax: (902) 420-8512 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B9E9646	
Address	6749 Moose River Rd	Address	2 Bluewater Rd., Suite 135	Project #	Fifteen Mile Stream		
	Middle Musquodoboit NS B0N 1X0		Bedford NS B4B 1G7	Project Name		Chain Of Custody Record	
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Site #		Project Manager	
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Sampled By			
						Maryann Comeau	

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)											Turnaround Time (TAT) Required:		
		Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	Please provide advance notice for rush projects	
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal														Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input type="checkbox"/> Standard TAT = 5-7 Working days for most tests.	
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SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis
1 SID#429383	SW <u>2</u>	19/06/03	8:20	H ₂ O			X	X	X	X	X	X	X	X	X	X		
2 SID#429384	SW <u>2</u> (Filtered)	"	8:20	"														
3 SID#429385	SW <u>3</u>	"	9:30	"			X	X	X	X	X	X	X	X	X	X		
4 SID#429386	SW <u>3</u> (Filtered)	"	9:30	"														
5 SID#429387	SW <u>6</u>	"	13:30	"			X	X	X	X	X	X	X	X	X	X		
6 SID#429388	SW <u>6</u> (Filtered)	"	13:30	"														
7 SID#429389	SW <u>7</u>	"	11:30	"			X	X	X	X	X	X	X	X	X	X		
8 SID#429390	SW <u>7</u> (Filtered)	"	11:30	"														
9 SID#429391	SW <u>10</u>	"	12:35	"			X	X	X	X	X	X	X	X	X	X		
10 SID#429392	SW <u>10</u> (Filtered)	"	12:35	"														

2019 JUN 3 15:45

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only	
	19/06/03	15:55					Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt
								Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No

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Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B9E9646	719798
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	Project Manager
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #		 C#719798-01-02	Maryann Comeau
				Sampled By			

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)											Turnaround Time (TAT) Required:	
		Field Filled & Preserved	Lab Filtration Required	Phosphorus Total Colourimetry	Total Tungsten in Water	Sir. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al. RCAP-MS Diss(Field/Filt) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CYA/ALL)	Please provide advance notice for rush projects	
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal													Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input type="checkbox"/> Standard TAT = 5-7 Working days for most tests.	
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Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filled & Preserved	Lab Filtration Required	Phosphorus Total Colourimetry	Total Tungsten in Water	Sir. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al. RCAP-MS Diss(Field/Filt) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CYA/ALL)	# of Bottles	Comments / Hazards / Other Required Analysis
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3 SID#429385	SW <u>3</u>	"	9:30	"			X	X	X	X	X						
4 SID#429386	SW <u>3</u> (Filtered)	"	9:30	"								X	X	X	X		
5 SID#429387	SW <u>6</u>	"	13:30	"			X	X	X	X	X						
6 SID#429388	SW <u>6</u> (Filtered)	"	13:30	"								X	X	X	X		
7 SID#429389	SW <u>7</u>	"	11:30	"			X	X	X	X	X						
8 SID#429390	SW <u>7</u> (Filtered)	"	11:30	"								X	X	X	X		
9 SID#429391	SW <u>10</u>	"	12:35	"			X	X	X	X	X						
10 SID#429392	SW <u>10</u> (Filtered)	"	12:35	"								X	X	X	X		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only	
<i>Ryan Gardiner</i> Ryan Gardiner	19/06/03	15:55	<i>Ryan Gardiner</i>				Time Sensitive	Temperature (°C) on Receipt
							<input type="checkbox"/>	Custody Seal Intact on Cooler?
							<input type="checkbox"/> Yes <input type="checkbox"/> No	

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Chain Of Custody Record

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Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B9E9646	719798
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Site #		CR719798-02-01	Maryann Comeau
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Sampled By			

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)											Turnaround Time (TAT) Required:		
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Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis
1 SID#429393	SW 11	19/06/08	8:50	H ₂ O			X	X	X	X	X	X	X	X	X	X		
2 SID#429394	SW 11 (Filtered)	"	8:50	"														
3	SW 12	"	10:15	"			X	X	X	X	X	X	X	X	X	X		
4	SW 12 Filtered	"	10:15	"														
5	SW 14	"	11:00	"			X	X	X	X	X	X	X	X	X	X		
6	SW 14 Filtered	"	11:00	"														
7	FMS Dup 1	"		"			X	X	X	X	X	X	X	X	X	X		
8	Field/Filter Blank	"		"			X	X	X	X	X	X	X	X	X	X		
9	Trip Blank	"		"			X	X	X	X	X	X	X	X	X	X		
10																		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# Jars used and not submitted	Lab Use Only	
<i>Ryan Gardiner</i>	19/06/08	15:55	<i>[Signature]</i>				Time Sensitive <input type="checkbox"/>	Temperature (°C) on Receipt
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Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	Project Manager
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			Maryann Comeau
				Sampled By		CH719798-02-02	

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:		
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SID#429393	SW 11	19/06/03	8:50	H ₂ O			X	X	X	X	X						
SID#429394	SW 11 (Filtered)	"	8:50	"								X	X	X	X		
	SW 12	"	10:15	"			X	X	X	X							
	SW 12 Filtered	"	10:15	"								X	X	X	X		
	SW 14	"	11:00	"			X	X	X	X							
	SW 14 Filtered	"	11:00	"								X	X	X	X		
	FMS Dup. 1	"		"			X	X	X	X	X	X	X	X	X		
	Field / Filter Blank	"		"			X	X	X	X	X	X	X	X	X		2019 JUN 3 15:55
	Trip Blank	"		"			X	X	X	X	X	X	X	X	X		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only
<i>Ryan Gardiner</i> Ryan Gardiner	19/06/03	8:55	<i>QBW</i>				Time Sensitive <input type="checkbox"/>
						Temperature (°C) on Receipt	Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No

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Methyl Mercury Results

Flett Research Ltd.

440 DeSalaberry Ave. Winnipeg, MB R2L 0Y7
Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR061819JS1
Page 1 of 1

CLIENT: Bureau Veritas - Bedford: B9E9646

200 Bluewater Road, Suite 105
Bedford, NS B4B 1G9

Date Received: June 6, 2019
Sampling Date: June 3, 2019

Matrix: Water

Transaction ID: 894

PO/Contract No.:

Date Analysed: June 18, 2019

Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 2)

Comments: Samples (except for FIELD/FILTER BLANK) had particulates present.
Samples SW 11 and SW 12 were also more yellowish in colour.

Detection Limit: The method detection limit (MDL) for this method is 0.0035 ng/L. The MDL is the minimum concentration that can be reported with 99% confidence that the measured concentration exceeds zero and is based on the distillation of 45mL of raw sample and analysis of 20mL of a 40mL distillate.

For reporting purpose samples are flagged when concentration is below the methods EPA defined minimum level (ML= 0.0135 ng/L).
As concentration rises above the MDL confidence that the analyte is present approaches 100% at and above the ML.

Estimated Uncertainty: Overall estimated uncertainty (95 % confidence, K=2) of this method varies with analyte concentration.
When methyl mercury concentrations exceed 0.03ng/L the estimated uncertainty is ±15%. At a concentration of 0.01ng/L uncertainty is ± 23%. Method uncertainty for concentrations at MDL (0.0035ng/L) is ±75%.

Results authorized by Dr. Robert J. Flett, Chief Scientist

Blanks		Pg of CH3Hg in the Ethylation Blank	Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L) <small>assumes volume is 30mL</small>					
Ethylation blank (H ₂ O+Reagents)		0.11	8.84	0.004					
Mean Eth. Blank (last 30 runs)		0.11							
		Net Pg CH3Hg in the Method Blank <small>(Eth. Blank subtracted)</small>	Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) <small>(Eth. Blank subtracted)</small>					
Method Blank 1		0.25	29.32	0.010					
Method Blank 2		0.24	28.74	0.010					
Method Blank 3		0.24	28.81	0.011					
Mean Method Blank				0.010					
Mean Calibration Factor <small>(area units / pg)</small>		81.91 ± 2.8 %RSD							
QUALITY DATA	Spike Recovery <small>Matrix Spike (MS) and Matrix Spike Duplicate (MSD)</small>		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)
	JWV274-15R (SW 2)		MS1	1978.13	48.61	100%	1.00	87.0	%RPD=0.8
	JWV274-15R (SW 2)		MS1D	1884.71	48.45	100%	1.00	86.4	
	JWW871-15R (SW 11)		MS2	1865.68	48.70	100%	0.98	86.0	
	JWW871-15R (SW 11)		MS2D	1848.52	47.79	100%	0.98	84.0	%RPD=2.3
	Mean of Spike Recoveries								85.9
	QC Samples <small>Ongoing Precision & Recovery (OPR)</small>		MeOPR ID1701 (1000ng/L)	<small>(beginning of run)</small>	1116.36	0.050	100%	936	93.6
			MeOPR ID1701 (1000ng/L)	<small>(end of run)</small>	1017.45	0.050	100%	905	90.5
	Mean of MeOPR							921	92.1
	Alternate Source Standard (A.S.S.)		A.S.S.-Alfa ID1302 (1000 ng/L)		2358.92		100%	956	95.6
LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) <small>(Ethylation & Method Blank subtracted) (recovery corrected)</small>
95205	JWV274-15R	SW 2	June 3, 2019	08:20		230.29	48.38	85.9%	0.123
95206	JWV276-15R	SW 3	June 3, 2019	09:30		97.18	48.91	85.9%	0.042
95207	JWV278-15R	SW 6	June 3, 2019	13:30		247.92	47.71	85.9%	0.138
95208	JWV280-15R	SW 7	June 3, 2019	11:30		211.04	47.78	85.9%	0.114
95209	JWV282-15R	SW 10	June 3, 2019	12:35		169.30	47.25	85.9%	0.085
95210	JWW871-15R	SW 11	June 3, 2019	08:50		230.02	48.81	85.9%	0.117
95211	JWW873-15R	SW 12	June 3, 2019	10:15		400.11	49.00	85.9%	0.217
95212	JWW875-15R	SW 14	June 3, 2019	11:00	DupA1	414.52	47.73	85.9%	0.236
95212	JWW875-15R	SW 14	June 3, 2019	11:00	DupA2	413.40	48.34	85.9%	0.242
95213	JWW877-15R	FMS DUP 1	June 3, 2019			119.16	47.74	85.9%	0.056
95214	JWW879-15R	FIELD/FILTER BLANK	June 3, 2019			28.27	48.62	85.9%	<0.0035

Q:\Clients A-L\Bureau Veritas - Bedford\2019\894\Methyl mercury\MTWATR061819JS1.xls

* : See 'Comments' section above for discussion.

This test report shall not be reproduced, except in full, without written approval of the laboratory.
Note: Results relate only to the items tested.

Dup : Duplicate - two subsamples of the same sample carried through the analytical procedure in an identical manner.



ISO/IEC 17025:2005 Accredited with the Canadian Association for Laboratory Accreditation

M10211-1 Version 05/17/19



Your P.O. #: 5628
 Your Project #: Fifteen Mile Stream
 Your C.O.C. #: 719798-03-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/06/26
 Report #: R5773025
 Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F1476

Received: 2019/06/04, 15:08

Sample Matrix: Water
 # Samples Received: 17

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO3) in water (5)	9	N/A	2019/06/10		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	1	N/A	2019/06/10	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	16	N/A	2019/06/11	N/A	SM 23 4500-CO2 D
Alkalinity	17	N/A	2019/06/10	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	17	N/A	2019/06/11	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	9	N/A	2019/06/06	ATL SOP 00042	SM 23 5220D m
Colour	17	N/A	2019/06/07	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	5	2019/06/10	2019/06/10	CAM SOP-00457	OMOE E3015 5 m
Total Cyanide (1)	2	2019/06/11	2019/06/11	CAM SOP-00457	OMOE E3015 5 m
Total Cyanide (1)	1	2019/06/11	2019/06/12	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (6)	8	N/A	2019/06/06	ATL SOP 00203	SM 23 5310B m
Organic carbon - Diss (DOC) (as rec'd) (6)	1	N/A	2019/06/10	ATL SOP 00203	SM 23 5310B m
Conductance - water	1	N/A	2019/06/10	ATL SOP 00004	SM 23 2510B m
Conductance - water	16	N/A	2019/06/11	ATL SOP 00004	SM 23 2510B m
Fluoride	9	N/A	2019/06/11	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	17	N/A	2019/06/10	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	8	2019/06/07	2019/06/07	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	9	2019/06/07	2019/06/07	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	8	N/A	2019/06/07	ATL SOP 00058	EPA 6020B R2 m
Metals Water Diss. MS (as rec'd)	1	N/A	2019/06/11	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	8	2019/06/07	2019/06/07	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	1	2019/06/07	2019/06/08	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	8	N/A	2019/06/11	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	8	N/A	2019/06/12	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	15	N/A	2019/06/12	N/A	Auto Calc.
Anion and Cation Sum	17	N/A	2019/06/11	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	8	2019/06/13	2019/06/16	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	1	N/A	2019/06/07	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water	16	N/A	2019/06/10	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	17	N/A	2019/06/11	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	17	N/A	2019/06/11	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	17	N/A	2019/06/12	ATL SOP 00018	ASTM D3867-16



Your P.O. #: 5628
 Your Project #: Fifteen Mile Stream
 Your C.O.C. #: 719798-03-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/06/26
 Report #: R5773025
 Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F1476

Received: 2019/06/04, 15:08

Sample Matrix: Water
 # Samples Received: 17

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
pH (7)	1	N/A	2019/06/10	ATL SOP 00003	SM 23 4500-H+ B m
pH (7)	16	N/A	2019/06/11	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	17	N/A	2019/06/07	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (3, 8)	8	N/A	2019/06/21	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (5)	9	N/A	2019/06/11		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	1	N/A	2019/06/10	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	15	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	1	N/A	2019/06/12	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2019/06/10	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	15	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2019/06/12	ATL SOP 00049	Auto Calc.
Reactive Silica	17	N/A	2019/06/11	ATL SOP 00022	EPA 366.0 m
Sulphate	17	N/A	2019/06/11	ATL SOP 00023	ASTM D516-16 m
Methyl Mercury (sub from Bedford) (4)	8	N/A	2019/06/19		EPA 1630
Total Dissolved Solids (Filt. Residue)	4	2019/06/06	2019/06/07	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (Filt. Residue)	5	2019/06/06	2019/06/12	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	17	N/A	2019/06/12	N/A	Auto Calc.
Organic carbon - Total (TOC) (9)	2	N/A	2019/06/07	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (9)	14	N/A	2019/06/10	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (9)	1	N/A	2019/06/11	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	9	2019/06/10	2019/06/11	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	9	2019/06/06	2019/06/10	ATL SOP 00007	SM 23 2540D m
Turbidity	3	N/A	2019/06/07	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	14	N/A	2019/06/10	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All



Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 719798-03-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/06/26
Report #: R5773025
Version: 4 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F1476

Received: 2019/06/04, 15:08

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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Laboratories Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Bureau Veritas Laboratories Kitimat
- (4) This test was performed by Sub Bedford to Flett Research
- (5) Non-accredited test method
- (6) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (7) 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.
- (8) Radium-226 results have not been corrected for blanks.
- (9) 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.

Maryann Comeau, Project Manager
Email: Maryann.COMEAU@bvlabs.com
Phone# (902)420-0203 Ext:298

=====
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF834			JXF850			JXF850		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20			2019/06/04 09:20		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	RDL	QC Batch	SW 1 (FILTERED) Lab-Dup	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.0800	N/A	6158982	0.130	N/A	6158982			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976			
Calculated TDS	mg/L	10	1.0	6158991	12	1.0	6158991			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976			
Cation Sum	me/L	0.180	N/A	6158982	0.170	N/A	6158982			
Hardness (CaCO3)	mg/L	3.1	1.0	6158979	3.0	1.0	6158979			
Ion Balance (% Difference)	%	38.5	N/A	6158981	13.3	N/A	6158981			
Langelier Index (@ 20C)	N/A	NC		6158987	NC		6158987			
Langelier Index (@ 4C)	N/A	NC		6158989	NC		6158989			
Nitrate (N)	mg/L	<0.050	0.050	6158984	<0.050	0.050	6158984			
Saturation pH (@ 20C)	N/A	NC		6158987	NC		6158987			
Saturation pH (@ 4C)	N/A	NC		6158989	NC		6158989			

Inorganics										
Acidity	mg/L	11	5.0	6167129						
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167418	<5.0	5.0	6167418	<5.0	5.0	6167418
Total Chemical Oxygen Demand	mg/L	44	20	6161311						
Dissolved Chloride (Cl-)	mg/L	2.9	1.0	6169592	2.9	1.0	6169592			
Colour	TCU	120	25	6163903	120	25	6163903	110	25	6163903
Total Dissolved Solids	mg/L	23	10	6161936						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6167478						
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169609	<0.050	0.050	6169609			
Nitrite (N)	mg/L	<0.010	0.010	6169610	<0.010	0.010	6169610			
Nitrogen (Ammonia Nitrogen)	mg/L	0.054	0.050	6167558	<0.050	0.050	6167558			
Dissolved Organic Carbon (C)	mg/L				14	0.5	6161486			
Total Organic Carbon (C)	mg/L	13	0.50	6167490	14	0.50	6163938			
Orthophosphate (P)	mg/L	<0.010	0.010	6163933	<0.010	0.010	6163933	<0.010	0.010	6163933
pH	pH	5.28	N/A	6167473	5.51	N/A	6167502	5.31	N/A	6167502
Total Phosphorus	mg/L	0.021	0.020	6167185						
Salinity	N/A	<2.0	2.0	6169233						
Reactive Silica (SiO2)	mg/L	3.2	0.50	6169597	3.0	0.50	6169597			
Total Suspended Solids	mg/L	2.6	1.0	6161611						

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF834			JXF850			JXF850		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20			2019/06/04 09:20		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	RDL	QC Batch	SW 1 (FILTERED) Lab-Dup	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6169595	2.5	2.0	6169595			
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6168856						
Turbidity	NTU	1.6	0.10	6167151	0.13	0.10	6167151			
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192962						
Conductivity	uS/cm	20	1.0	6167477	21	1.0	6167504	21	1.0	6167504
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572						
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6166923						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF851			JXF851			JXF852		
Sampling Date		2019/06/04 08:50			2019/06/04 08:50			2019/06/04 08:50		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 4	RDL	QC Batch	SW 4 Lab-Dup	RDL	QC Batch	SW 4 (FILTERED)	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.230	N/A	6158982				0.260	N/A	6158982
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5.2	1.0	6158976				5.1	1.0	6158976
Calculated TDS	mg/L	17	1.0	6158991				18	1.0	6158991
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976				<1.0	1.0	6158976
Cation Sum	me/L	0.230	N/A	6158982				0.220	N/A	6158982
Hardness (CaCO3)	mg/L	5.9	1.0	6158979				5.8	1.0	6158979
Ion Balance (% Difference)	%	0.00	N/A	6158981				8.33	N/A	6158981
Langelier Index (@ 20C)	N/A	-4.44		6158987				-4.01		6158987
Langelier Index (@ 4C)	N/A	-4.69		6158989				-4.26		6158989
Nitrate (N)	mg/L	0.072	0.050	6158984				0.074	0.050	6158984
Saturation pH (@ 20C)	N/A	10.3		6158987				10.3		6158987
Saturation pH (@ 4C)	N/A	10.6		6158989				10.6		6158989

Inorganics										
Acidity	mg/L	8.8	5.0	6167129						
Total Alkalinity (Total as CaCO3)	mg/L	5.2	5.0	6167418				5.1	5.0	6167418
Total Chemical Oxygen Demand	mg/L	27	20	6161311						
Dissolved Chloride (Cl-)	mg/L	2.7	1.0	6169592				2.6	1.0	6169592
Colour	TCU	53	10	6163903				51	10	6163903
Total Dissolved Solids	mg/L	38	10	6161936						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6167478						
Nitrate + Nitrite (N)	mg/L	0.072	0.050	6169609				0.074	0.050	6169609
Nitrite (N)	mg/L	<0.010	0.010	6169610				<0.010	0.010	6169610
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6161902	<0.050	0.050	6161902	<0.050	0.050	6167558
Dissolved Organic Carbon (C)	mg/L							9.3	0.5	6161486
Total Organic Carbon (C)	mg/L	8.7	0.50	6163938				8.4	0.50	6167491
Orthophosphate (P)	mg/L	<0.010	0.010	6163933				<0.010	0.010	6163933
pH	pH	5.89	N/A	6167473				6.31	N/A	6167493
Total Phosphorus	mg/L	<0.020	0.020	6167185						
Salinity	N/A	<2.0	2.0	6169233						
Reactive Silica (SiO2)	mg/L	3.2	0.50	6169597				2.9	0.50	6169597
Total Suspended Solids	mg/L	<1.0	1.0	6161611						

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF851			JXF851			JXF852		
Sampling Date		2019/06/04 08:50			2019/06/04 08:50			2019/06/04 08:50		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 4	RDL	QC Batch	SW 4 Lab-Dup	RDL	QC Batch	SW 4 (FILTERED)	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	2.4	2.0	6169595				3.9	2.0	6169595
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6169817						
Turbidity	NTU	0.89	0.10	6167151				0.28	0.10	6167151
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192962						
Conductivity	uS/cm	24	1.0	6167477				24	1.0	6167498
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572						
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6166923						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF853			JXF856			JXF859		
Sampling Date		2019/06/04 10:40			2019/06/04 10:40			2019/06/04 12:10		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 5	RDL	QC Batch	SW 5 (FILTERED)	RDL	QC Batch	SW 8	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.0900	N/A	6158982	0.0900	N/A	6158982	0.100	N/A	6158982
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976	<1.0	1.0	6158976
Calculated TDS	mg/L	9.0	1.0	6158991	9.0	1.0	6158991	9.0	1.0	6158991
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976	<1.0	1.0	6158976
Cation Sum	me/L	0.170	N/A	6158982	0.170	N/A	6158982	0.190	N/A	6158982
Hardness (CaCO3)	mg/L	3.0	1.0	6158979	3.0	1.0	6158979	2.8	1.0	6158979
Ion Balance (% Difference)	%	30.8	N/A	6158981	30.8	N/A	6158981	31.0	N/A	6158981
Langelier Index (@ 20C)	N/A	NC		6158987	NC		6158987	NC		6158987
Langelier Index (@ 4C)	N/A	NC		6158989	NC		6158989	NC		6158989
Nitrate (N)	mg/L	0.055	0.050	6158984	0.078	0.050	6158984	<0.050	0.050	6158984
Saturation pH (@ 20C)	N/A	NC		6158987	NC		6158987	NC		6158987
Saturation pH (@ 4C)	N/A	NC		6158989	NC		6158989	NC		6158989

Inorganics										
Acidity	mg/L	<5.0	5.0	6167129				<5.0	5.0	6167129
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167418	<5.0	5.0	6167418	<5.0	5.0	6167368
Total Chemical Oxygen Demand	mg/L	24	20	6161311				22	20	6161311
Dissolved Chloride (Cl-)	mg/L	3.0	1.0	6169592	3.0	1.0	6169592	3.6	1.0	6169592
Colour	TCU	54	25	6163903	55	25	6163903	59	25	6163906
Total Dissolved Solids	mg/L	24	10	6161936				33	10	6161936
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6167478				<0.10	0.10	6167478
Nitrate + Nitrite (N)	mg/L	0.055	0.050	6169609	0.078	0.050	6169609	<0.050	0.050	6169609
Nitrite (N)	mg/L	<0.010	0.010	6169610	<0.010	0.010	6169610	<0.010	0.010	6169610
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568	<0.050	0.050	6167568	<0.050	0.050	6167568
Dissolved Organic Carbon (C)	mg/L				8.3	0.5	6161486			
Total Organic Carbon (C)	mg/L	7.6	0.50	6167490	8.1	0.50	6167491	8.1	0.50	6167491
Orthophosphate (P)	mg/L	<0.010	0.010	6163933	<0.010	0.010	6163933	<0.010	0.010	6163930
pH	pH	5.86	N/A	6167473	6.08	N/A	6167493	5.33	N/A	6167473
Total Phosphorus	mg/L	<0.020	0.020	6167185				<0.020	0.020	6167185
Salinity	N/A	<2.0	2.0	6169233				<2.0	2.0	6169233
Reactive Silica (SiO2)	mg/L	1.6	0.50	6169597	1.7	0.50	6169597	1.9	0.50	6169597
Total Suspended Solids	mg/L	1.8	1.0	6161611				2.4	1.0	6161611
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6169595	<2.0	2.0	6169595	<2.0	2.0	6169595

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



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF853			JXF856			JXF859		
Sampling Date		2019/06/04 10:40			2019/06/04 10:40			2019/06/04 12:10		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 5	RDL	QC Batch	SW 5 (FILTERED)	RDL	QC Batch	SW 8	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6168856				<0.0050	0.0050	6168856
Turbidity	NTU	1.3	0.10	6167151	0.25	0.10	6167151	1.2	0.10	6163996
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6192962				<0.0030	0.0030	6192962
Conductivity	uS/cm	18	1.0	6167477	19	1.0	6167498	20	1.0	6167477
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6170572				<0.010	0.010	6170572
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6166923				ATTACHED	N/A	6166923
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF859			JXF860			JXF861		
Sampling Date		2019/06/04 12:10			2019/06/04 12:10			2019/06/04 11:30		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 8 Lab-Dup	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch	SW 9	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.180	N/A	6158982	0.120	N/A	6158982
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6158976	<1.0	1.0	6158976
Calculated TDS	mg/L				14	1.0	6158991	10	1.0	6158991
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6158976	<1.0	1.0	6158976
Cation Sum	me/L				0.180	N/A	6158982	0.190	N/A	6158982
Hardness (CaCO3)	mg/L				2.8	1.0	6158979	2.7	1.0	6158979
Ion Balance (% Difference)	%				0.00	N/A	6158981	22.6	N/A	6158981
Langelier Index (@ 20C)	N/A				NC		6158987	NC		6158987
Langelier Index (@ 4C)	N/A				NC		6158989	NC		6158989
Nitrate (N)	mg/L				<0.050	0.050	6158984	<0.050	0.050	6158984
Saturation pH (@ 20C)	N/A				NC		6158987	NC		6158987
Saturation pH (@ 4C)	N/A				NC		6158989	NC		6158989

Inorganics										
Acidity	mg/L							<5.0	5.0	6167129
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167368	<5.0	5.0	6167368
Total Chemical Oxygen Demand	mg/L							24	20	6161311
Dissolved Chloride (Cl-)	mg/L				3.6	1.0	6169592	4.1	1.0	6169592
Colour	TCU				61	25	6163906	36	5.0	6163906
Total Dissolved Solids	mg/L	27	10	6161936				25	10	6170231
Dissolved Fluoride (F-)	mg/L							<0.10	0.10	6167478
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6169609	<0.050	0.050	6169609
Nitrite (N)	mg/L				<0.010	0.010	6169610	<0.010	0.010	6169610
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6167568	<0.050	0.050	6167568
Dissolved Organic Carbon (C)	mg/L				8.5	0.5	6161486			
Total Organic Carbon (C)	mg/L				8.1	0.50	6167491	5.4	0.50	6167490
Orthophosphate (P)	mg/L				<0.010	0.010	6163930	<0.010	0.010	6163930
pH	pH				5.88	N/A	6167502	6.02	N/A	6167473
Total Phosphorus	mg/L							0.023	0.020	6167185
Salinity	N/A							<2.0	2.0	6169233
Reactive Silica (SiO2)	mg/L				2.0	0.50	6169597	1.5	0.50	6169597
Total Suspended Solids	mg/L							1.6	1.0	6161611

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF859			JXF860			JXF861		
Sampling Date		2019/06/04 12:10			2019/06/04 12:10			2019/06/04 11:30		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 8 Lab-Dup	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch	SW 9	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L				4.0	2.0	6169595	<2.0	2.0	6169595
Total Cyanide (CN)	mg/L							<0.0050	0.0050	6168856
Turbidity	NTU				0.29	0.10	6167151	1.3	0.10	6163756
WAD Cyanide (Free)	mg/L							<0.0030	0.0030	6192962
Conductivity	uS/cm				21	1.0	6167504	23	1.0	6167477
RADIONUCLIDE										
Radium-226	Bq/L							<0.010	0.010	6170572
Subcontracted Analysis										
Subcontract Parameter	N/A							ATTACHED	N/A	6166923
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF861			JXF862			JXF863		
Sampling Date		2019/06/04 11:30			2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 9 Lab-Dup	RDL	QC Batch	SW 9 (FILTERED)	RDL	QC Batch	SW 16	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.120	N/A	6158982	0.140	N/A	6158982
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6158976	<1.0	1.0	6158976
Calculated TDS	mg/L				10	1.0	6158991	11	1.0	6158991
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6158976	<1.0	1.0	6158976
Cation Sum	me/L				0.200	N/A	6158982	0.170	N/A	6158982
Hardness (CaCO3)	mg/L				2.7	1.0	6158979	2.9	1.0	6158979
Ion Balance (% Difference)	%				25.0	N/A	6158981	9.68	N/A	6158981
Langelier Index (@ 20C)	N/A				NC		6158987	NC		6158987
Langelier Index (@ 4C)	N/A				NC		6158989	NC		6158989
Nitrate (N)	mg/L				<0.050	0.050	6158984	<0.050	0.050	6158984
Saturation pH (@ 20C)	N/A				NC		6158987	NC		6158987
Saturation pH (@ 4C)	N/A				NC		6158989	NC		6158989

Inorganics										
Acidity	mg/L							<5.0	5.0	6167129
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167368	<5.0	5.0	6167368
Total Chemical Oxygen Demand	mg/L							22	20	6161311
Dissolved Chloride (Cl-)	mg/L				4.2	1.0	6169592	3.0	1.0	6169592
Colour	TCU				36	5.0	6163906	59	25	6163906
Total Dissolved Solids	mg/L							24	10	6170231
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6167478				<0.10	0.10	6167478
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6169609	<0.050	0.050	6169609
Nitrite (N)	mg/L				<0.010	0.010	6169610	<0.010	0.010	6169610
Nitrogen (Ammonia Nitrogen)	mg/L				0.056	0.050	6167568	<0.050	0.050	6167568
Dissolved Organic Carbon (C)	mg/L				5.8	0.5	6161486			
Total Organic Carbon (C)	mg/L				5.8	0.50	6167491	7.5	0.50	6167490
Orthophosphate (P)	mg/L				<0.010	0.010	6163930	<0.010	0.010	6163930
pH	pH	5.87	N/A	6167473	5.53	N/A	6167502	5.71	N/A	6167473
Total Phosphorus	mg/L							<0.020	0.020	6167185
Salinity	N/A							<2.0	2.0	6169233
Reactive Silica (SiO2)	mg/L				1.5	0.50	6169597	1.6	0.50	6169597
Total Suspended Solids	mg/L							2.0	1.0	6161611

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF861			JXF862			JXF863		
Sampling Date		2019/06/04 11:30			2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 9 Lab-Dup	RDL	QC Batch	SW 9 (FILTERED)	RDL	QC Batch	SW 16	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6169595	2.5	2.0	6169595
Total Cyanide (CN)	mg/L							<0.0050	0.0050	6168856
Turbidity	NTU				0.25	0.10	6167151	0.89	0.10	6163756
WAD Cyanide (Free)	mg/L							<0.0030	0.0030	6192962
Conductivity	uS/cm	23	1.0	6167477	23	1.0	6167504	19	1.0	6167477
RADIONUCLIDE										
Radium-226	Bq/L							<0.010	0.010	6170572
Subcontracted Analysis										
Subcontract Parameter	N/A							ATTACHED	N/A	6166923
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF864			JXF877			JXF877		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 Lab-Dup	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L	0.180	N/A	6158982	0.140	N/A	6158982			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976			
Calculated TDS	mg/L	13	1.0	6158991	11	1.0	6158991			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976			
Cation Sum	me/L	0.170	N/A	6158982	0.170	N/A	6158982			
Hardness (CaCO3)	mg/L	3.0	1.0	6158979	2.9	1.0	6158979			
Ion Balance (% Difference)	%	2.86	N/A	6158981	9.68	N/A	6158981			
Langelier Index (@ 20C)	N/A	NC		6158987	NC		6158987			
Langelier Index (@ 4C)	N/A	NC		6158989	NC		6158989			
Nitrate (N)	mg/L	<0.050	0.050	6158984	<0.050	0.050	6158984			
Saturation pH (@ 20C)	N/A	NC		6158987	NC		6158987			
Saturation pH (@ 4C)	N/A	NC		6158989	NC		6158989			

Inorganics										
Acidity	mg/L				5.8	5.0	6167129			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167368	<5.0	5.0	6167368			
Total Chemical Oxygen Demand	mg/L				22	20	6161311			
Dissolved Chloride (Cl-)	mg/L	3.0	1.0	6169592	3.1	1.0	6169592			
Colour	TCU	61	25	6163906	57	25	6163906			
Total Dissolved Solids	mg/L				38	10	6170231			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6167478			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169609	<0.050	0.050	6169609			
Nitrite (N)	mg/L	<0.010	0.010	6169610	<0.010	0.010	6169610			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568	<0.050	0.050	6167568			
Dissolved Organic Carbon (C)	mg/L	8.2	0.5	6161486						
Total Organic Carbon (C)	mg/L	7.7	0.50	6167491	7.7	0.50	6167490			
Orthophosphate (P)	mg/L	<0.010	0.010	6163930	<0.010	0.010	6163930			
pH	pH	6.12	N/A	6167502	5.47	N/A	6167473			
Total Phosphorus	mg/L				<0.020	0.020	6167185			
Salinity	N/A				<2.0	2.0	6169233			
Reactive Silica (SiO2)	mg/L	1.8	0.50	6169597	1.6	0.50	6169597			
Total Suspended Solids	mg/L				1.8	1.0	6161611			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BV Labs Job #: B9F1476
 Report Date: 2019/06/26

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF864			JXF877			JXF877		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 Lab-Dup	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	4.8	2.0	6169595	2.4	2.0	6169595			
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6170191	<0.0050	0.0050	6170191
Turbidity	NTU	0.15	0.10	6167151	0.98	0.10	6167151			
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192962			
Conductivity	uS/cm	19	1.0	6167504	19	1.0	6167477			
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6170572			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6166923			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF879			JXF880		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FMS DUP 2 FF	RDL	QC Batch	FIELD/FILTER BLANK 2	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.0800	N/A	6158982	0.00	N/A	6158982
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976
Calculated TDS	mg/L	8.0	1.0	6158991	<1.0	1.0	6158991
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6158976	<1.0	1.0	6158976
Cation Sum	me/L	0.170	N/A	6158982	0.00	N/A	6158982
Hardness (CaCO ₃)	mg/L	3.0	1.0	6158979	<1.0	1.0	6158979
Ion Balance (% Difference)	%	36.0	N/A	6158981			
Langelier Index (@ 20C)	N/A	NC		6158987	NC		6158987
Langelier Index (@ 4C)	N/A	NC		6158989	NC		6158989
Nitrate (N)	mg/L	<0.050	0.050	6158984	<0.050	0.050	6158984
Saturation pH (@ 20C)	N/A	NC		6158987	NC		6158987
Saturation pH (@ 4C)	N/A	NC		6158989	NC		6158989
Inorganics							
Acidity	mg/L				<5.0	5.0	6167129
Total Alkalinity (Total as CaCO ₃)	mg/L	<5.0	5.0	6167368	<5.0	5.0	6167368
Total Chemical Oxygen Demand	mg/L				<20	20	6161311
Dissolved Chloride (Cl ⁻)	mg/L	3.0	1.0	6169592	<1.0	1.0	6169592
Colour	TCU	61	25	6163906	<5.0	5.0	6163906
Total Dissolved Solids	mg/L				<10	10	6170231
Dissolved Fluoride (F ⁻)	mg/L				<0.10	0.10	6167478
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169609	<0.050	0.050	6169609
Nitrite (N)	mg/L	<0.010	0.010	6169610	<0.010	0.010	6169610
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568	<0.050	0.050	6167568
Dissolved Organic Carbon (C)	mg/L	8.2	0.5	6161486			
Total Organic Carbon (C)	mg/L	7.9	0.50	6167491	<0.50	0.50	6167490
Orthophosphate (P)	mg/L	<0.010	0.010	6163930	<0.010	0.010	6163930
pH	pH	6.13	N/A	6164137	5.77	N/A	6167473
Total Phosphorus	mg/L				<0.020	0.020	6167185
Salinity	N/A				<2.0	2.0	6169233
Reactive Silica (SiO ₂)	mg/L	1.8	0.50	6169597	<0.50	0.50	6169597
Total Suspended Solids	mg/L				<1.0	1.0	6161611
Dissolved Sulphate (SO ₄)	mg/L	<2.0	2.0	6169595	<2.0	2.0	6169595
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



BV Labs Job #: B9F1476
 Report Date: 2019/06/26

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF879			JXF880		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FMS DUP 2 FF	RDL	QC Batch	FIELD/FILTER BLANK 2	RDL	QC Batch
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6169817
Turbidity	NTU	0.56	0.10	6167151	<0.10	0.10	6167151
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6192962
Conductivity	uS/cm	20	1.0	6164141	<1.0	1.0	6167477
RADIONUCLIDE							
Radium-226	Bq/L				<0.010	0.010	6170572
Subcontracted Analysis							
Subcontract Parameter	N/A				ATTACHED	N/A	6166923
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF881			JXF881		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FIELD/FILTER BLANK 2 FF	RDL	QC Batch	FIELD/FILTER BLANK 2 FF Lab-Dup	RDL	QC Batch

Calculated Parameters							
Anion Sum	me/L	0.00	N/A	6158982			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976			
Calculated TDS	mg/L	1.0	1.0	6158991			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976			
Cation Sum	me/L	0.0100	N/A	6158982			
Hardness (CaCO3)	mg/L	<1.0	1.0	6158979			
Ion Balance (% Difference)	%	100	N/A	6158981			
Langelier Index (@ 20C)	N/A	NC		6158987			
Langelier Index (@ 4C)	N/A	NC		6158989			
Nitrate (N)	mg/L	<0.050	0.050	6158984			
Saturation pH (@ 20C)	N/A	NC		6158987			
Saturation pH (@ 4C)	N/A	NC		6158989			

Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167369	<5.0	5.0	6167369
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6169592			
Colour	TCU	<5.0	5.0	6163907	<5.0	5.0	6163907
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169609			
Nitrite (N)	mg/L	<0.010	0.010	6169610			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568			
Dissolved Organic Carbon (C)	mg/L	<0.5	0.5	6161486			
Total Organic Carbon (C)	mg/L	0.64	0.50	6167491			
Orthophosphate (P)	mg/L	<0.010	0.010	6163926	<0.010	0.010	6163926
pH	pH	5.83 (1)	N/A	6167493	5.57 (1)	N/A	6167493
Reactive Silica (SiO2)	mg/L	0.85	0.50	6169597			
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6169595			
Turbidity	NTU	<0.10	0.10	6167151			
Conductivity	uS/cm	1.1	1.0	6167498	1.2	1.0	6167498

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 (1) Poor duplicate agreement due to sample matrix, results confirmed by repeat analysis.



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF882			JXF882		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.00	N/A	6158982			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976			
Calculated TDS	mg/L	<1.0	1.0	6158991			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6158976			
Cation Sum	me/L	0.00	N/A	6158982			
Hardness (CaCO3)	mg/L	<1.0	1.0	6158979			
Langelier Index (@ 20C)	N/A	NC		6158987			
Langelier Index (@ 4C)	N/A	NC		6158989			
Nitrate (N)	mg/L	<0.050	0.050	6158984			
Saturation pH (@ 20C)	N/A	NC		6158987			
Saturation pH (@ 4C)	N/A	NC		6158989			
Inorganics							
Acidity	mg/L	<5.0	5.0	6167129			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167368			
Total Chemical Oxygen Demand	mg/L	<20	20	6161311	<20	20	6161311
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6169592			
Colour	TCU	<5.0	5.0	6163906			
Total Dissolved Solids	mg/L	<10	10	6170231			
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6167478			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169609			
Nitrite (N)	mg/L	<0.010	0.010	6169610			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568			
Dissolved Organic Carbon (C)	mg/L	<0.5	0.5	6167479			
Total Organic Carbon (C)	mg/L	<0.50	0.50	6167491			
Orthophosphate (P)	mg/L	<0.010	0.010	6163930			
pH	pH	5.67	N/A	6167473			
Total Phosphorus	mg/L	<0.020	0.020	6167185			
Salinity	N/A	<2.0	2.0	6169233			
Reactive Silica (SiO2)	mg/L	<0.50	0.50	6169597			
Total Suspended Solids	mg/L	<1.0	1.0	6161611			
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6169595			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BV Labs Job #: B9F1476
 Report Date: 2019/06/26

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXF882			JXF882		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Turbidity	NTU	0.28	0.10	6167151			
Conductivity	uS/cm	<1.0	1.0	6167477			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JXF834			JXF850	JXF850		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20	2019/06/04 09:20		
COC Number		719798-03-01			719798-03-01	719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	SW 1 (FILTERED) Lab-Dup	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L				<0.013	<0.013	0.013	6161204
Total Mercury (Hg)	ug/L	<0.013	0.013	6161203				
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								

BV Labs ID		JXF851			JXF852			JXF853		
Sampling Date		2019/06/04 08:50			2019/06/04 08:50			2019/06/04 10:40		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 4	RDL	QC Batch	SW 4 (FILTERED)	RDL	QC Batch	SW 5	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6161204			
Total Mercury (Hg)	ug/L	0.013	0.013	6161203				0.015	0.013	6161203
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF856			JXF859			JXF860		
Sampling Date		2019/06/04 10:40			2019/06/04 12:10			2019/06/04 12:10		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 5 (FILTERED)	RDL	QC Batch	SW 8	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6161204				<0.013	0.013	6161204
Total Mercury (Hg)	ug/L				<0.013	0.013	6161203			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JXF861			JXF862			JXF863		
Sampling Date		2019/06/04 11:30			2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 9	RDL	QC Batch	SW 9 (FILTERED)	RDL	QC Batch	SW 16	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6161204			
Total Mercury (Hg)	ug/L	<0.013	0.013	6161203				<0.013	0.013	6161203
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF864			JXF877			JXF879		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6161204				<0.013	0.013	6161204
Total Mercury (Hg)	ug/L				<0.013	0.013	6161203			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF880			JXF881		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FIELD/FILTER BLANK 2	RDL	QC Batch	FIELD/FILTER BLANK 2 FF	RDL	QC Batch

Metals							
Dissolved Mercury (Hg)	ug/L				<0.013	0.013	6161204
Total Mercury (Hg)	ug/L	<0.013	0.013	6161203			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JXF882		
Sampling Date		2019/06/04		
COC Number		719798-03-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Metals				
Total Mercury (Hg)	ug/L	<0.013	0.013	6161203
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF834			JXF850			JXF851		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20			2019/06/04 08:50		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	RDL	QC Batch	SW 4	RDL	QC Batch

Metals										
Dissolved Aluminum (Al)	ug/L				280	5.0	6163961			
Total Aluminum (Al)	ug/L	300	5.0	6163740				280	5.0	6163740
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6163961			
Total Antimony (Sb)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163740
Dissolved Arsenic (As)	ug/L				1.5	1.0	6163961			
Total Arsenic (As)	ug/L	1.9	1.0	6163740				27	1.0	6163740
Dissolved Barium (Ba)	ug/L				4.2	1.0	6163961			
Total Barium (Ba)	ug/L	4.9	1.0	6163740				2.8	1.0	6163740
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6163961			
Total Beryllium (Be)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163740
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6163961			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Boron (B)	ug/L				<50	50	6163961			
Total Boron (B)	ug/L	<50	50	6163740				<50	50	6163740
Dissolved Cadmium (Cd)	ug/L				0.015	0.010	6163961			
Total Cadmium (Cd)	ug/L	0.023	0.010	6163740				0.019	0.010	6163740
Dissolved Calcium (Ca)	ug/L				670	100	6163961			
Total Calcium (Ca)	ug/L	710	100	6163740				1800	100	6163740
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6163961			
Total Chromium (Cr)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163740
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6163961			
Total Cobalt (Co)	ug/L	<0.40	0.40	6163740				<0.40	0.40	6163740
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6163961			
Total Copper (Cu)	ug/L	<0.50	0.50	6163740				1.7	0.50	6163740
Dissolved Iron (Fe)	ug/L				240	50	6163961			
Total Iron (Fe)	ug/L	350	50	6163740				320	50	6163740
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6163961			
Total Lead (Pb)	ug/L	<0.50	0.50	6163740				<0.50	0.50	6163740
Dissolved Magnesium (Mg)	ug/L				320	100	6163961			
Total Magnesium (Mg)	ug/L	320	100	6163740				340	100	6163740
Dissolved Manganese (Mn)	ug/L				27	2.0	6163961			
Total Manganese (Mn)	ug/L	44	2.0	6163740				75	2.0	6163740
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6163961			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF834			JXF850			JXF851		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20			2019/06/04 08:50		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	RDL	QC Batch	SW 4	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6163961			
Total Nickel (Ni)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Phosphorus (P)	ug/L				<100	100	6163961			
Total Phosphorus (P)	ug/L	<100	100	6163740				<100	100	6163740
Dissolved Potassium (K)	ug/L				250	100	6163961			
Total Potassium (K)	ug/L	250	100	6163740				260	100	6163740
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6163961			
Total Selenium (Se)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163740
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6163961			
Total Silver (Ag)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163740
Dissolved Sodium (Na)	ug/L				2200	100	6163961			
Total Sodium (Na)	ug/L	2100	100	6163740				2200	100	6163740
Dissolved Strontium (Sr)	ug/L				6.9	2.0	6163961			
Total Strontium (Sr)	ug/L	6.6	2.0	6163740				7.0	2.0	6163740
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6163961			
Total Thallium (Tl)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163740
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6163961			
Total Tin (Sn)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Titanium (Ti)	ug/L				3.0	2.0	6163961			
Total Titanium (Ti)	ug/L	3.5	2.0	6163740				<2.0	2.0	6163740
Dissolved Uranium (U)	ug/L				<0.10	0.10	6163961			
Total Uranium (U)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163740
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6163961			
Total Vanadium (V)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163740
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6163961			
Total Zinc (Zn)	ug/L	<5.0	5.0	6163740				<5.0	5.0	6163740
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF852	JXF852			JXF853		
Sampling Date		2019/06/04 08:50	2019/06/04 08:50			2019/06/04 10:40		
COC Number		719798-03-01	719798-03-01			719798-03-01		
	UNITS	SW 4 (FILTERED)	SW 4 (FILTERED) Lab-Dup	RDL	QC Batch	SW 5	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	260	260	5.0	6163961			
Total Aluminum (Al)	ug/L					200	5.0	6163740
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	1.0	6163961			
Total Antimony (Sb)	ug/L					<1.0	1.0	6163740
Dissolved Arsenic (As)	ug/L	21	21	1.0	6163961			
Total Arsenic (As)	ug/L					14	1.0	6163740
Dissolved Barium (Ba)	ug/L	2.6	2.6	1.0	6163961			
Total Barium (Ba)	ug/L					3.5	1.0	6163740
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	1.0	6163961			
Total Beryllium (Be)	ug/L					<1.0	1.0	6163740
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	6163961			
Total Bismuth (Bi)	ug/L					<2.0	2.0	6163740
Dissolved Boron (B)	ug/L	<50	<50	50	6163961			
Total Boron (B)	ug/L					<50	50	6163740
Dissolved Cadmium (Cd)	ug/L	0.015	0.017	0.010	6163961			
Total Cadmium (Cd)	ug/L					0.016	0.010	6163740
Dissolved Calcium (Ca)	ug/L	1800	1800	100	6163961			
Total Calcium (Ca)	ug/L					690	100	6163740
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	1.0	6163961			
Total Chromium (Cr)	ug/L					1.0	1.0	6163740
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	0.40	6163961			
Total Cobalt (Co)	ug/L					<0.40	0.40	6163740
Dissolved Copper (Cu)	ug/L	1.2	1.2	0.50	6163961			
Total Copper (Cu)	ug/L					0.53	0.50	6163740
Dissolved Iron (Fe)	ug/L	230	230	50	6163961			
Total Iron (Fe)	ug/L					280	50	6163740
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	6163961			
Total Lead (Pb)	ug/L					<0.50	0.50	6163740
Dissolved Magnesium (Mg)	ug/L	340	340	100	6163961			
Total Magnesium (Mg)	ug/L					310	100	6163740
Dissolved Manganese (Mn)	ug/L	71	72	2.0	6163961			
Total Manganese (Mn)	ug/L					70	2.0	6163740
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF852	JXF852			JXF853		
Sampling Date		2019/06/04 08:50	2019/06/04 08:50			2019/06/04 10:40		
COC Number		719798-03-01	719798-03-01			719798-03-01		
	UNITS	SW 4 (FILTERED)	SW 4 (FILTERED) Lab-Dup	RDL	QC Batch	SW 5	RDL	QC Batch
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	6163961			
Total Molybdenum (Mo)	ug/L					<2.0	2.0	6163740
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	2.0	6163961			
Total Nickel (Ni)	ug/L					<2.0	2.0	6163740
Dissolved Phosphorus (P)	ug/L	<100	<100	100	6163961			
Total Phosphorus (P)	ug/L					<100	100	6163740
Dissolved Potassium (K)	ug/L	240	250	100	6163961			
Total Potassium (K)	ug/L					240	100	6163740
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	1.0	6163961			
Total Selenium (Se)	ug/L					<1.0	1.0	6163740
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	6163961			
Total Silver (Ag)	ug/L					<0.10	0.10	6163740
Dissolved Sodium (Na)	ug/L	2200	2200	100	6163961			
Total Sodium (Na)	ug/L					2100	100	6163740
Dissolved Strontium (Sr)	ug/L	7.2	7.3	2.0	6163961			
Total Strontium (Sr)	ug/L					5.7	2.0	6163740
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	0.10	6163961			
Total Thallium (Tl)	ug/L					<0.10	0.10	6163740
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	2.0	6163961			
Total Tin (Sn)	ug/L					<2.0	2.0	6163740
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	2.0	6163961			
Total Titanium (Ti)	ug/L					2.3	2.0	6163740
Dissolved Uranium (U)	ug/L	<0.10	<0.10	0.10	6163961			
Total Uranium (U)	ug/L					<0.10	0.10	6163740
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	2.0	6163961			
Total Vanadium (V)	ug/L					<2.0	2.0	6163740
Dissolved Zirconium (Zr)	ug/L	<2.0	<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L					<2.0	2.0	6163740
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	6163961			
Total Zinc (Zn)	ug/L					<5.0	5.0	6163740

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF856			JXF859			JXF860		
Sampling Date		2019/06/04 10:40			2019/06/04 12:10			2019/06/04 12:10		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 5 (FILTERED)	RDL	QC Batch	SW 8	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	190	5.0	6163961				200	5.0	6163961
Total Aluminum (Al)	ug/L				230	5.0	6163740			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Antimony (Sb)	ug/L				<1.0	1.0	6163740			
Dissolved Arsenic (As)	ug/L	13	1.0	6163961				<1.0	1.0	6163961
Total Arsenic (As)	ug/L				<1.0	1.0	6163740			
Dissolved Barium (Ba)	ug/L	3.5	1.0	6163961				4.8	1.0	6163961
Total Barium (Ba)	ug/L				5.1	1.0	6163740			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Beryllium (Be)	ug/L				<1.0	1.0	6163740			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Bismuth (Bi)	ug/L				<2.0	2.0	6163740			
Dissolved Boron (B)	ug/L	<50	50	6163961				<50	50	6163961
Total Boron (B)	ug/L				<50	50	6163740			
Dissolved Cadmium (Cd)	ug/L	0.018	0.010	6163961				0.019	0.010	6163961
Total Cadmium (Cd)	ug/L				0.019	0.010	6163740			
Dissolved Calcium (Ca)	ug/L	690	100	6163961				610	100	6163961
Total Calcium (Ca)	ug/L				610	100	6163740			
Dissolved Chromium (Cr)	ug/L	1.0	1.0	6163961				1.0	1.0	6163961
Total Chromium (Cr)	ug/L				<1.0	1.0	6163740			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6163961				<0.40	0.40	6163961
Total Cobalt (Co)	ug/L				<0.40	0.40	6163740			
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6163961				<0.50	0.50	6163961
Total Copper (Cu)	ug/L				<0.50	0.50	6163740			
Dissolved Iron (Fe)	ug/L	220	50	6163961				150	50	6163961
Total Iron (Fe)	ug/L				190	50	6163740			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6163961				<0.50	0.50	6163961
Total Lead (Pb)	ug/L				<0.50	0.50	6163740			
Dissolved Magnesium (Mg)	ug/L	300	100	6163961				310	100	6163961
Total Magnesium (Mg)	ug/L				310	100	6163740			
Dissolved Manganese (Mn)	ug/L	67	2.0	6163961				54	2.0	6163961
Total Manganese (Mn)	ug/L				57	2.0	6163740			
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF856			JXF859			JXF860		
Sampling Date		2019/06/04 10:40			2019/06/04 12:10			2019/06/04 12:10		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 5 (FILTERED)	RDL	QC Batch	SW 8	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6163740			
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Nickel (Ni)	ug/L				<2.0	2.0	6163740			
Dissolved Phosphorus (P)	ug/L	<100	100	6163961				<100	100	6163961
Total Phosphorus (P)	ug/L				<100	100	6163740			
Dissolved Potassium (K)	ug/L	260	100	6163961				260	100	6163961
Total Potassium (K)	ug/L				270	100	6163740			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Selenium (Se)	ug/L				<1.0	1.0	6163740			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Silver (Ag)	ug/L				<0.10	0.10	6163740			
Dissolved Sodium (Na)	ug/L	2100	100	6163961				2600	100	6163961
Total Sodium (Na)	ug/L				2600	100	6163740			
Dissolved Strontium (Sr)	ug/L	6.0	2.0	6163961				4.8	2.0	6163961
Total Strontium (Sr)	ug/L				4.9	2.0	6163740			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Thallium (Tl)	ug/L				<0.10	0.10	6163740			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Tin (Sn)	ug/L				<2.0	2.0	6163740			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Titanium (Ti)	ug/L				2.1	2.0	6163740			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Uranium (U)	ug/L				<0.10	0.10	6163740			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Vanadium (V)	ug/L				<2.0	2.0	6163740			
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Zirconium (Zr)	ug/L				<2.0	2.0	6163740			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6163961				<5.0	5.0	6163961
Total Zinc (Zn)	ug/L				<5.0	5.0	6163740			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF861			JXF862			JXF863		
Sampling Date		2019/06/04 11:30			2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 9	RDL	QC Batch	SW 9 (FILTERED)	RDL	QC Batch	SW 16	RDL	QC Batch

Metals										
Dissolved Aluminum (Al)	ug/L				160	5.0	6163961			
Total Aluminum (Al)	ug/L	190	5.0	6163740				210	5.0	6163752
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6163961			
Total Antimony (Sb)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163752
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6163961			
Total Arsenic (As)	ug/L	<1.0	1.0	6163740				9.7	1.0	6163752
Dissolved Barium (Ba)	ug/L				4.9	1.0	6163961			
Total Barium (Ba)	ug/L	5.1	1.0	6163740				3.7	1.0	6163752
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6163961			
Total Beryllium (Be)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163752
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6163961			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Boron (B)	ug/L				<50	50	6163961			
Total Boron (B)	ug/L	<50	50	6163740				<50	50	6163752
Dissolved Cadmium (Cd)	ug/L				0.017	0.010	6163961			
Total Cadmium (Cd)	ug/L	0.018	0.010	6163740				0.015	0.010	6163752
Dissolved Calcium (Ca)	ug/L				570	100	6163961			
Total Calcium (Ca)	ug/L	570	100	6163740				680	100	6163752
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6163961			
Total Chromium (Cr)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163752
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6163961			
Total Cobalt (Co)	ug/L	<0.40	0.40	6163740				<0.40	0.40	6163752
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6163961			
Total Copper (Cu)	ug/L	<0.50	0.50	6163740				0.61	0.50	6163752
Dissolved Iron (Fe)	ug/L				89	50	6163961			
Total Iron (Fe)	ug/L	150	50	6163740				260	50	6163752
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6163961			
Total Lead (Pb)	ug/L	<0.50	0.50	6163740				<0.50	0.50	6163752
Dissolved Magnesium (Mg)	ug/L				300	100	6163961			
Total Magnesium (Mg)	ug/L	300	100	6163740				300	100	6163752
Dissolved Manganese (Mn)	ug/L				64	2.0	6163961			
Total Manganese (Mn)	ug/L	76	2.0	6163740				72	2.0	6163752
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6163961			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF861			JXF862			JXF863		
Sampling Date		2019/06/04 11:30			2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 9	RDL	QC Batch	SW 9 (FILTERED)	RDL	QC Batch	SW 16	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6163961			
Total Nickel (Ni)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Phosphorus (P)	ug/L				<100	100	6163961			
Total Phosphorus (P)	ug/L	<100	100	6163740				<100	100	6163752
Dissolved Potassium (K)	ug/L				270	100	6163961			
Total Potassium (K)	ug/L	260	100	6163740				260	100	6163752
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6163961			
Total Selenium (Se)	ug/L	<1.0	1.0	6163740				<1.0	1.0	6163752
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6163961			
Total Silver (Ag)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163752
Dissolved Sodium (Na)	ug/L				2900	100	6163961			
Total Sodium (Na)	ug/L	2900	100	6163740				2100	100	6163752
Dissolved Strontium (Sr)	ug/L				4.8	2.0	6163961			
Total Strontium (Sr)	ug/L	4.5	2.0	6163740				5.8	2.0	6163752
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6163961			
Total Thallium (Tl)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163752
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6163961			
Total Tin (Sn)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6163961			
Total Titanium (Ti)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Uranium (U)	ug/L				<0.10	0.10	6163961			
Total Uranium (U)	ug/L	<0.10	0.10	6163740				<0.10	0.10	6163752
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6163961			
Total Vanadium (V)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6163740				<2.0	2.0	6163752
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6163961			
Total Zinc (Zn)	ug/L	<5.0	5.0	6163740				<5.0	5.0	6163752

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF864			JXF877			JXF879		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L	200	5.0	6163961				200	5.0	6163961
Total Aluminum (Al)	ug/L				220	5.0	6163740			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Antimony (Sb)	ug/L				<1.0	1.0	6163740			
Dissolved Arsenic (As)	ug/L	8.3	1.0	6163961				8.1	1.0	6163961
Total Arsenic (As)	ug/L				9.6	1.0	6163740			
Dissolved Barium (Ba)	ug/L	3.6	1.0	6163961				3.6	1.0	6163961
Total Barium (Ba)	ug/L				3.7	1.0	6163740			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Beryllium (Be)	ug/L				<1.0	1.0	6163740			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Bismuth (Bi)	ug/L				<2.0	2.0	6163740			
Dissolved Boron (B)	ug/L	<50	50	6163961				<50	50	6163961
Total Boron (B)	ug/L				<50	50	6163740			
Dissolved Cadmium (Cd)	ug/L	0.013	0.010	6163961				0.015	0.010	6163961
Total Cadmium (Cd)	ug/L				0.014	0.010	6163740			
Dissolved Calcium (Ca)	ug/L	690	100	6163961				710	100	6163961
Total Calcium (Ca)	ug/L				680	100	6163740			
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6163961				1.1	1.0	6163961
Total Chromium (Cr)	ug/L				<1.0	1.0	6163740			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6163961				<0.40	0.40	6163961
Total Cobalt (Co)	ug/L				<0.40	0.40	6163740			
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6163961				<0.50	0.50	6163961
Total Copper (Cu)	ug/L				<0.50	0.50	6163740			
Dissolved Iron (Fe)	ug/L	200	50	6163961				200	50	6163961
Total Iron (Fe)	ug/L				260	50	6163740			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6163961				<0.50	0.50	6163961
Total Lead (Pb)	ug/L				<0.50	0.50	6163740			
Dissolved Magnesium (Mg)	ug/L	300	100	6163961				310	100	6163961
Total Magnesium (Mg)	ug/L				300	100	6163740			
Dissolved Manganese (Mn)	ug/L	67	2.0	6163961				66	2.0	6163961
Total Manganese (Mn)	ug/L				73	2.0	6163740			
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF864			JXF877			JXF879		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6163740			
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Nickel (Ni)	ug/L				<2.0	2.0	6163740			
Dissolved Phosphorus (P)	ug/L	<100	100	6163961				<100	100	6163961
Total Phosphorus (P)	ug/L				<100	100	6163740			
Dissolved Potassium (K)	ug/L	250	100	6163961				260	100	6163961
Total Potassium (K)	ug/L				250	100	6163740			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6163961				<1.0	1.0	6163961
Total Selenium (Se)	ug/L				<1.0	1.0	6163740			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Silver (Ag)	ug/L				<0.10	0.10	6163740			
Dissolved Sodium (Na)	ug/L	2100	100	6163961				2100	100	6163961
Total Sodium (Na)	ug/L				2100	100	6163740			
Dissolved Strontium (Sr)	ug/L	5.3	2.0	6163961				6.2	2.0	6163961
Total Strontium (Sr)	ug/L				6.0	2.0	6163740			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Thallium (Tl)	ug/L				<0.10	0.10	6163740			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Tin (Sn)	ug/L				<2.0	2.0	6163740			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Titanium (Ti)	ug/L				2.0	2.0	6163740			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6163961				<0.10	0.10	6163961
Total Uranium (U)	ug/L				<0.10	0.10	6163740			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Vanadium (V)	ug/L				<2.0	2.0	6163740			
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6163961				<2.0	2.0	6163961
Total Zirconium (Zr)	ug/L				<2.0	2.0	6163740			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6163961				<5.0	5.0	6163961
Total Zinc (Zn)	ug/L				<5.0	5.0	6163740			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF880			JXF881		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FIELD/FILTER BLANK 2	RDL	QC Batch	FIELD/FILTER BLANK 2 FF	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6163961
Total Aluminum (Al)	ug/L	<5.0	5.0	6163740			
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6163961
Total Antimony (Sb)	ug/L	<1.0	1.0	6163740			
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6163961
Total Arsenic (As)	ug/L	<1.0	1.0	6163740			
Dissolved Barium (Ba)	ug/L				<1.0	1.0	6163961
Total Barium (Ba)	ug/L	<1.0	1.0	6163740			
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6163961
Total Beryllium (Be)	ug/L	<1.0	1.0	6163740			
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6163961
Total Bismuth (Bi)	ug/L	<2.0	2.0	6163740			
Dissolved Boron (B)	ug/L				<50	50	6163961
Total Boron (B)	ug/L	<50	50	6163740			
Dissolved Cadmium (Cd)	ug/L				<0.010	0.010	6163961
Total Cadmium (Cd)	ug/L	<0.010	0.010	6163740			
Dissolved Calcium (Ca)	ug/L				<100	100	6163961
Total Calcium (Ca)	ug/L	<100	100	6163740			
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6163961
Total Chromium (Cr)	ug/L	<1.0	1.0	6163740			
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6163961
Total Cobalt (Co)	ug/L	<0.40	0.40	6163740			
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6163961
Total Copper (Cu)	ug/L	<0.50	0.50	6163740			
Dissolved Iron (Fe)	ug/L				<50	50	6163961
Total Iron (Fe)	ug/L	<50	50	6163740			
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6163961
Total Lead (Pb)	ug/L	<0.50	0.50	6163740			
Dissolved Magnesium (Mg)	ug/L				<100	100	6163961
Total Magnesium (Mg)	ug/L	<100	100	6163740			
Dissolved Manganese (Mn)	ug/L				<2.0	2.0	6163961
Total Manganese (Mn)	ug/L	<2.0	2.0	6163740			
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6163961
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF880			JXF881		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	FIELD/FILTER BLANK 2	RDL	QC Batch	FIELD/FILTER BLANK 2 FF	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6163740			
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6163961
Total Nickel (Ni)	ug/L	<2.0	2.0	6163740			
Dissolved Phosphorus (P)	ug/L				<100	100	6163961
Total Phosphorus (P)	ug/L	<100	100	6163740			
Dissolved Potassium (K)	ug/L				<100	100	6163961
Total Potassium (K)	ug/L	<100	100	6163740			
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6163961
Total Selenium (Se)	ug/L	<1.0	1.0	6163740			
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6163961
Total Silver (Ag)	ug/L	<0.10	0.10	6163740			
Dissolved Sodium (Na)	ug/L				120	100	6163961
Total Sodium (Na)	ug/L	<100	100	6163740			
Dissolved Strontium (Sr)	ug/L				<2.0	2.0	6163961
Total Strontium (Sr)	ug/L	<2.0	2.0	6163740			
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6163961
Total Thallium (Tl)	ug/L	<0.10	0.10	6163740			
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6163961
Total Tin (Sn)	ug/L	<2.0	2.0	6163740			
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6163961
Total Titanium (Ti)	ug/L	<2.0	2.0	6163740			
Dissolved Uranium (U)	ug/L				<0.10	0.10	6163961
Total Uranium (U)	ug/L	<0.10	0.10	6163740			
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6163961
Total Vanadium (V)	ug/L	<2.0	2.0	6163740			
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6163961
Total Zirconium (Zr)	ug/L	<2.0	2.0	6163740			
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6163961
Total Zinc (Zn)	ug/L	<5.0	5.0	6163740			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF882			JXF882		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6167410	<5.0	5.0	6167410
Total Aluminum (Al)	ug/L	<5.0	5.0	6163740			
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Antimony (Sb)	ug/L	<1.0	1.0	6163740			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Arsenic (As)	ug/L	<1.0	1.0	6163740			
Dissolved Barium (Ba)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Barium (Ba)	ug/L	<1.0	1.0	6163740			
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Beryllium (Be)	ug/L	<1.0	1.0	6163740			
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Bismuth (Bi)	ug/L	<2.0	2.0	6163740			
Dissolved Boron (B)	ug/L	<50	50	6167410	<50	50	6167410
Total Boron (B)	ug/L	<50	50	6163740			
Dissolved Cadmium (Cd)	ug/L	<0.010	0.010	6167410	<0.010	0.010	6167410
Total Cadmium (Cd)	ug/L	<0.010	0.010	6163740			
Dissolved Calcium (Ca)	ug/L	<100	100	6167410	<100	100	6167410
Total Calcium (Ca)	ug/L	<100	100	6163740			
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Chromium (Cr)	ug/L	<1.0	1.0	6163740			
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6167410	<0.40	0.40	6167410
Total Cobalt (Co)	ug/L	<0.40	0.40	6163740			
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6167410	<0.50	0.50	6167410
Total Copper (Cu)	ug/L	<0.50	0.50	6163740			
Dissolved Iron (Fe)	ug/L	<50	50	6167410	<50	50	6167410
Total Iron (Fe)	ug/L	<50	50	6163740			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6167410	<0.50	0.50	6167410
Total Lead (Pb)	ug/L	<0.50	0.50	6163740			
Dissolved Magnesium (Mg)	ug/L	<100	100	6167410	<100	100	6167410
Total Magnesium (Mg)	ug/L	<100	100	6163740			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Manganese (Mn)	ug/L	<2.0	2.0	6163740			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXF882			JXF882		
Sampling Date		2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6163740			
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Nickel (Ni)	ug/L	<2.0	2.0	6163740			
Dissolved Phosphorus (P)	ug/L	<100	100	6167410	<100	100	6167410
Total Phosphorus (P)	ug/L	<100	100	6163740			
Dissolved Potassium (K)	ug/L	<100	100	6167410	<100	100	6167410
Total Potassium (K)	ug/L	<100	100	6163740			
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6167410	<1.0	1.0	6167410
Total Selenium (Se)	ug/L	<1.0	1.0	6163740			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6167410	<0.10	0.10	6167410
Total Silver (Ag)	ug/L	<0.10	0.10	6163740			
Dissolved Sodium (Na)	ug/L	<100	100	6167410	<100	100	6167410
Total Sodium (Na)	ug/L	<100	100	6163740			
Dissolved Strontium (Sr)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Strontium (Sr)	ug/L	<2.0	2.0	6163740			
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6167410	<0.10	0.10	6167410
Total Thallium (Tl)	ug/L	<0.10	0.10	6163740			
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Tin (Sn)	ug/L	<2.0	2.0	6163740			
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Titanium (Ti)	ug/L	<2.0	2.0	6163740			
Dissolved Uranium (U)	ug/L	<0.10	0.10	6167410	<0.10	0.10	6167410
Total Uranium (U)	ug/L	<0.10	0.10	6163740			
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6167410	<2.0	2.0	6167410
Total Vanadium (V)	ug/L	<2.0	2.0	6163740			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6163740			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6167410	<5.0	5.0	6167410
Total Zinc (Zn)	ug/L	<5.0	5.0	6163740			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JXF834			JXF850			JXF851		
Sampling Date		2019/06/04 09:20			2019/06/04 09:20			2019/06/04 08:50		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 1	RDL	QC Batch	SW 1 (FILTERED)	RDL	QC Batch	SW 4	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6166270			
Total Tungsten (W)	ug/L	<1.0	1.0	6170626				<1.0	1.0	6170626
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF852			JXF853			JXF856		
Sampling Date		2019/06/04 08:50			2019/06/04 10:40			2019/06/04 10:40		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 4 (FILTERED)	RDL	QC Batch	SW 5	RDL	QC Batch	SW 5 (FILTERED)	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6166270				<1.0	1.0	6166270
Total Tungsten (W)	ug/L				<1.0	1.0	6170626			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF859			JXF860			JXF861		
Sampling Date		2019/06/04 12:10			2019/06/04 12:10			2019/06/04 11:30		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 8	RDL	QC Batch	SW 8 (FILTERED)	RDL	QC Batch	SW 9	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6166270			
Total Tungsten (W)	ug/L	<1.0	1.0	6170626				<1.0	1.0	6170626
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JXF862	JXF862			JXF863		
Sampling Date		2019/06/04 11:30	2019/06/04 11:30			2019/06/04		
COC Number		719798-03-01	719798-03-01			719798-03-01		
	UNITS	SW 9 (FILTERED)	SW 9 (FILTERED) Lab-Dup	RDL	QC Batch	SW 16	RDL	QC Batch

Metals								
Dissolved Tungsten (W)	ug/L	<1.0	<1.0	1.0	6166270			
Total Tungsten (W)	ug/L					<1.0	1.0	6170626
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								

BV Labs ID		JXF864			JXF877			JXF879		
Sampling Date		2019/06/04			2019/06/04			2019/06/04		
COC Number		719798-03-01			719798-03-01			719798-03-01		
	UNITS	SW 16 (FILTERED)	RDL	QC Batch	FMS DUP 2	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6166270				<1.0	1.0	6166270
Total Tungsten (W)	ug/L				<1.0	1.0	6170626			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXF880			JXF881			
Sampling Date		2019/06/04			2019/06/04			
COC Number		719798-03-01			719798-03-01			
	UNITS	FIELD/FILTER BLANK 2	RDL	QC Batch	FIELD/FILTER BLANK 2 FF	RDL	QC Batch	

Metals								
Dissolved Tungsten (W)	ug/L					<1.0	1.0	6166270
Total Tungsten (W)	ug/L	<1.0	1.0	6170626				
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.7°C
Package 2	7.3°C
Package 3	11.3°C
Package 4	5.3°C

Sample JXF834 [SW 1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF850 [SW 1 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF852 [SW 4 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF853 [SW 5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF856 [SW 5 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF859 [SW 8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF861 [SW 9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF862 [SW 9 (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF863 [SW 16] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF877 [FMS DUP 2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF879 [FMS DUP 2 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXF881 [FIELD/FILTER BLANK 2 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.



QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6161203	CCR	Matrix Spike	Total Mercury (Hg)	2019/06/07		100	%	80 - 120
6161203	CCR	Spiked Blank	Total Mercury (Hg)	2019/06/07		101	%	80 - 120
6161203	CCR	Method Blank	Total Mercury (Hg)	2019/06/07	<0.013		ug/L	
6161203	CCR	RPD	Total Mercury (Hg)	2019/06/07	0		%	20
6161204	CCR	Matrix Spike [JXF852-06]	Dissolved Mercury (Hg)	2019/06/07		100	%	80 - 120
6161204	CCR	Spiked Blank	Dissolved Mercury (Hg)	2019/06/07		102	%	80 - 120
6161204	CCR	Method Blank	Dissolved Mercury (Hg)	2019/06/07	<0.013		ug/L	
6161204	CCR	RPD [JXF850-06]	Dissolved Mercury (Hg)	2019/06/07	NC		%	20
6161311	ZZH	Matrix Spike [JXF882-07]	Total Chemical Oxygen Demand	2019/06/06		103	%	80 - 120
6161311	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/06/06		100	%	80 - 120
6161311	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/06/06		103	%	80 - 120
6161311	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/06/06	<20		mg/L	
6161311	ZZH	RPD [JXF882-07]	Total Chemical Oxygen Demand	2019/06/06	NC		%	25
6161486	SSI	Matrix Spike	Dissolved Organic Carbon (C)	2019/06/06		94	%	85 - 115
6161486	SSI	Spiked Blank	Dissolved Organic Carbon (C)	2019/06/06		100	%	80 - 120
6161486	SSI	Method Blank	Dissolved Organic Carbon (C)	2019/06/06	<0.5		mg/L	
6161486	SSI	RPD	Dissolved Organic Carbon (C)	2019/06/06	10		%	15
6161611	MLW	QC Standard	Total Suspended Solids	2019/06/10		98	%	80 - 120
6161611	MLW	Method Blank	Total Suspended Solids	2019/06/10	<1.0		mg/L	
6161611	MLW	RPD	Total Suspended Solids	2019/06/10	4.7		%	20
6161902	NRG	Matrix Spike [JXF851-06]	Nitrogen (Ammonia Nitrogen)	2019/06/07		117	%	80 - 120
6161902	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07		108	%	80 - 120
6161902	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/07	<0.050		mg/L	
6161902	NRG	RPD [JXF851-06]	Nitrogen (Ammonia Nitrogen)	2019/06/07	NC		%	20
6161936	AM6	QC Standard	Total Dissolved Solids	2019/06/07		96	%	80 - 120
6161936	AM6	Method Blank	Total Dissolved Solids	2019/06/07	<10		mg/L	
6161936	AM6	RPD [JXF859-03]	Total Dissolved Solids	2019/06/07	18		%	25
6163740	BAN	Matrix Spike	Total Aluminum (Al)	2019/06/07		102	%	80 - 120
			Total Antimony (Sb)	2019/06/07		105	%	80 - 120
			Total Arsenic (As)	2019/06/07		100	%	80 - 120
			Total Barium (Ba)	2019/06/07		101	%	80 - 120
			Total Beryllium (Be)	2019/06/07		103	%	80 - 120
			Total Bismuth (Bi)	2019/06/07		103	%	80 - 120
			Total Boron (B)	2019/06/07		110	%	80 - 120
			Total Cadmium (Cd)	2019/06/07		99	%	80 - 120
			Total Calcium (Ca)	2019/06/07		NC	%	80 - 120
			Total Chromium (Cr)	2019/06/07		99	%	80 - 120
			Total Cobalt (Co)	2019/06/07		102	%	80 - 120
			Total Copper (Cu)	2019/06/07		100	%	80 - 120
			Total Iron (Fe)	2019/06/07		104	%	80 - 120
			Total Lead (Pb)	2019/06/07		102	%	80 - 120
			Total Magnesium (Mg)	2019/06/07		107	%	80 - 120
			Total Manganese (Mn)	2019/06/07		102	%	80 - 120
			Total Molybdenum (Mo)	2019/06/07		109	%	80 - 120
			Total Nickel (Ni)	2019/06/07		101	%	80 - 120
			Total Phosphorus (P)	2019/06/07		106	%	80 - 120
			Total Potassium (K)	2019/06/07		106	%	80 - 120
			Total Selenium (Se)	2019/06/07		99	%	80 - 120
			Total Silver (Ag)	2019/06/07		101	%	80 - 120
			Total Sodium (Na)	2019/06/07		100	%	80 - 120
			Total Strontium (Sr)	2019/06/07		104	%	80 - 120
			Total Thallium (Tl)	2019/06/07		105	%	80 - 120
			Total Tin (Sn)	2019/06/07		107	%	80 - 120
			Total Titanium (Ti)	2019/06/07		101	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6163740	BAN	Spiked Blank	Total Uranium (U)	2019/06/07		107	%	80 - 120
			Total Vanadium (V)	2019/06/07		100	%	80 - 120
			Total Zirconium (Zr)	2019/06/07		107	%	80 - 120
			Total Zinc (Zn)	2019/06/07		102	%	80 - 120
			Total Aluminum (Al)	2019/06/07		105	%	80 - 120
			Total Antimony (Sb)	2019/06/07		104	%	80 - 120
			Total Arsenic (As)	2019/06/07		100	%	80 - 120
			Total Barium (Ba)	2019/06/07		101	%	80 - 120
			Total Beryllium (Be)	2019/06/07		102	%	80 - 120
			Total Bismuth (Bi)	2019/06/07		103	%	80 - 120
			Total Boron (B)	2019/06/07		106	%	80 - 120
			Total Cadmium (Cd)	2019/06/07		99	%	80 - 120
			Total Calcium (Ca)	2019/06/07		106	%	80 - 120
			Total Chromium (Cr)	2019/06/07		100	%	80 - 120
			Total Cobalt (Co)	2019/06/07		103	%	80 - 120
			Total Copper (Cu)	2019/06/07		101	%	80 - 120
			Total Iron (Fe)	2019/06/07		108	%	80 - 120
			Total Lead (Pb)	2019/06/07		102	%	80 - 120
			Total Magnesium (Mg)	2019/06/07		111	%	80 - 120
			Total Manganese (Mn)	2019/06/07		103	%	80 - 120
			Total Molybdenum (Mo)	2019/06/07		106	%	80 - 120
			Total Nickel (Ni)	2019/06/07		102	%	80 - 120
			Total Phosphorus (P)	2019/06/07		107	%	80 - 120
			Total Potassium (K)	2019/06/07		108	%	80 - 120
			Total Selenium (Se)	2019/06/07		98	%	80 - 120
			Total Silver (Ag)	2019/06/07		97	%	80 - 120
			Total Sodium (Na)	2019/06/07		104	%	80 - 120
			Total Strontium (Sr)	2019/06/07		104	%	80 - 120
			Total Thallium (Tl)	2019/06/07		105	%	80 - 120
			Total Tin (Sn)	2019/06/07		103	%	80 - 120
			Total Titanium (Ti)	2019/06/07		108	%	80 - 120
			Total Uranium (U)	2019/06/07		107	%	80 - 120
Total Vanadium (V)	2019/06/07		100	%	80 - 120			
Total Zirconium (Zr)	2019/06/07		105	%	80 - 120			
Total Zinc (Zn)	2019/06/07		104	%	80 - 120			
6163740	BAN	Method Blank	Total Aluminum (Al)	2019/06/07	<5.0		ug/L	
			Total Antimony (Sb)	2019/06/07	<1.0		ug/L	
			Total Arsenic (As)	2019/06/07	<1.0		ug/L	
			Total Barium (Ba)	2019/06/07	<1.0		ug/L	
			Total Beryllium (Be)	2019/06/07	<1.0		ug/L	
			Total Bismuth (Bi)	2019/06/07	<2.0		ug/L	
			Total Boron (B)	2019/06/07	<50		ug/L	
			Total Cadmium (Cd)	2019/06/07	<0.010		ug/L	
			Total Calcium (Ca)	2019/06/07	<100		ug/L	
			Total Chromium (Cr)	2019/06/07	<1.0		ug/L	
			Total Cobalt (Co)	2019/06/07	<0.40		ug/L	
			Total Copper (Cu)	2019/06/07	<0.50		ug/L	
			Total Iron (Fe)	2019/06/07	<50		ug/L	
			Total Lead (Pb)	2019/06/07	<0.50		ug/L	
			Total Magnesium (Mg)	2019/06/07	<100		ug/L	
			Total Manganese (Mn)	2019/06/07	<2.0		ug/L	
Total Molybdenum (Mo)	2019/06/07	<2.0		ug/L				
Total Nickel (Ni)	2019/06/07	<2.0		ug/L				
Total Phosphorus (P)	2019/06/07	<100		ug/L				



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Potassium (K)	2019/06/07	<100		ug/L	
			Total Selenium (Se)	2019/06/07	<1.0		ug/L	
			Total Silver (Ag)	2019/06/07	<0.10		ug/L	
			Total Sodium (Na)	2019/06/07	<100		ug/L	
			Total Strontium (Sr)	2019/06/07	<2.0		ug/L	
			Total Thallium (Tl)	2019/06/07	<0.10		ug/L	
			Total Tin (Sn)	2019/06/07	<2.0		ug/L	
			Total Titanium (Ti)	2019/06/07	<2.0		ug/L	
			Total Uranium (U)	2019/06/07	<0.10		ug/L	
			Total Vanadium (V)	2019/06/07	<2.0		ug/L	
			Total Zirconium (Zr)	2019/06/07	<2.0		ug/L	
			Total Zinc (Zn)	2019/06/07	<5.0		ug/L	
6163740	BAN	RPD	Total Aluminum (Al)	2019/06/10	2.9		%	20
			Total Antimony (Sb)	2019/06/10	NC		%	20
			Total Arsenic (As)	2019/06/10	5.0		%	20
			Total Barium (Ba)	2019/06/10	0.19		%	20
			Total Beryllium (Be)	2019/06/10	NC		%	20
			Total Bismuth (Bi)	2019/06/10	NC		%	20
			Total Boron (B)	2019/06/10	NC		%	20
			Total Cadmium (Cd)	2019/06/10	1.6		%	20
			Total Calcium (Ca)	2019/06/10	1.4		%	20
			Total Chromium (Cr)	2019/06/10	11		%	20
			Total Cobalt (Co)	2019/06/10	NC		%	20
			Total Copper (Cu)	2019/06/10	8.1		%	20
			Total Lead (Pb)	2019/06/10	2.3		%	20
			Total Magnesium (Mg)	2019/06/10	0.013		%	20
			Total Manganese (Mn)	2019/06/10	7.3		%	20
			Total Molybdenum (Mo)	2019/06/10	NC		%	20
			Total Nickel (Ni)	2019/06/10	NC		%	20
			Total Phosphorus (P)	2019/06/10	NC		%	20
			Total Potassium (K)	2019/06/10	1.2		%	20
			Total Selenium (Se)	2019/06/10	NC		%	20
			Total Silver (Ag)	2019/06/10	NC		%	20
			Total Sodium (Na)	2019/06/10	1.7		%	20
			Total Strontium (Sr)	2019/06/10	2.2		%	20
			Total Thallium (Tl)	2019/06/10	NC		%	20
			Total Tin (Sn)	2019/06/10	NC		%	20
			Total Titanium (Ti)	2019/06/10	NC		%	20
			Total Uranium (U)	2019/06/10	2.2		%	20
			Total Vanadium (V)	2019/06/10	0.66		%	20
			Total Zinc (Zn)	2019/06/10	0.66		%	20
6163752	BAN	Matrix Spike	Total Aluminum (Al)	2019/06/08		104	%	80 - 120
			Total Antimony (Sb)	2019/06/08		106	%	80 - 120
			Total Arsenic (As)	2019/06/08		103	%	80 - 120
			Total Barium (Ba)	2019/06/08		103	%	80 - 120
			Total Beryllium (Be)	2019/06/08		107	%	80 - 120
			Total Bismuth (Bi)	2019/06/08		105	%	80 - 120
			Total Boron (B)	2019/06/08		110	%	80 - 120
			Total Cadmium (Cd)	2019/06/08		100	%	80 - 120
			Total Calcium (Ca)	2019/06/08		108	%	80 - 120
			Total Chromium (Cr)	2019/06/08		103	%	80 - 120
			Total Cobalt (Co)	2019/06/08		105	%	80 - 120
			Total Copper (Cu)	2019/06/08		102	%	80 - 120
			Total Iron (Fe)	2019/06/08		111	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Lead (Pb)	2019/06/08		105	%	80 - 120
			Total Magnesium (Mg)	2019/06/08		109	%	80 - 120
			Total Manganese (Mn)	2019/06/08		104	%	80 - 120
			Total Molybdenum (Mo)	2019/06/08		110	%	80 - 120
			Total Nickel (Ni)	2019/06/08		103	%	80 - 120
			Total Phosphorus (P)	2019/06/08		108	%	80 - 120
			Total Potassium (K)	2019/06/08		108	%	80 - 120
			Total Selenium (Se)	2019/06/08		100	%	80 - 120
			Total Silver (Ag)	2019/06/08		103	%	80 - 120
			Total Sodium (Na)	2019/06/08		103	%	80 - 120
			Total Strontium (Sr)	2019/06/08		108	%	80 - 120
			Total Thallium (Tl)	2019/06/08		108	%	80 - 120
			Total Tin (Sn)	2019/06/08		105	%	80 - 120
			Total Titanium (Ti)	2019/06/08		104	%	80 - 120
			Total Uranium (U)	2019/06/08		111	%	80 - 120
			Total Vanadium (V)	2019/06/08		103	%	80 - 120
			Total Zirconium (Zr)	2019/06/08		108	%	80 - 120
			Total Zinc (Zn)	2019/06/08		103	%	80 - 120
6163752	BAN	Spiked Blank	Total Aluminum (Al)	2019/06/08		103	%	80 - 120
			Total Antimony (Sb)	2019/06/08		105	%	80 - 120
			Total Arsenic (As)	2019/06/08		98	%	80 - 120
			Total Barium (Ba)	2019/06/08		99	%	80 - 120
			Total Beryllium (Be)	2019/06/08		102	%	80 - 120
			Total Bismuth (Bi)	2019/06/08		102	%	80 - 120
			Total Boron (B)	2019/06/08		105	%	80 - 120
			Total Cadmium (Cd)	2019/06/08		97	%	80 - 120
			Total Calcium (Ca)	2019/06/08		105	%	80 - 120
			Total Chromium (Cr)	2019/06/08		98	%	80 - 120
			Total Cobalt (Co)	2019/06/08		101	%	80 - 120
			Total Copper (Cu)	2019/06/08		99	%	80 - 120
			Total Iron (Fe)	2019/06/08		103	%	80 - 120
			Total Lead (Pb)	2019/06/08		102	%	80 - 120
			Total Magnesium (Mg)	2019/06/08		107	%	80 - 120
			Total Manganese (Mn)	2019/06/08		101	%	80 - 120
			Total Molybdenum (Mo)	2019/06/08		106	%	80 - 120
			Total Nickel (Ni)	2019/06/08		100	%	80 - 120
			Total Phosphorus (P)	2019/06/08		105	%	80 - 120
			Total Potassium (K)	2019/06/08		106	%	80 - 120
			Total Selenium (Se)	2019/06/08		98	%	80 - 120
			Total Silver (Ag)	2019/06/08		99	%	80 - 120
			Total Sodium (Na)	2019/06/08		100	%	80 - 120
			Total Strontium (Sr)	2019/06/08		101	%	80 - 120
			Total Thallium (Tl)	2019/06/08		104	%	80 - 120
			Total Tin (Sn)	2019/06/08		103	%	80 - 120
			Total Titanium (Ti)	2019/06/08		103	%	80 - 120
			Total Uranium (U)	2019/06/08		108	%	80 - 120
			Total Vanadium (V)	2019/06/08		100	%	80 - 120
			Total Zirconium (Zr)	2019/06/08		103	%	80 - 120
			Total Zinc (Zn)	2019/06/08		99	%	80 - 120
6163752	BAN	Method Blank	Total Aluminum (Al)	2019/06/08	<5.0		ug/L	
			Total Antimony (Sb)	2019/06/08	<1.0		ug/L	
			Total Arsenic (As)	2019/06/08	<1.0		ug/L	
			Total Barium (Ba)	2019/06/08	<1.0		ug/L	
			Total Beryllium (Be)	2019/06/08	<1.0		ug/L	



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2019/06/08	<2.0		ug/L	
			Total Boron (B)	2019/06/08	<50		ug/L	
			Total Cadmium (Cd)	2019/06/08	<0.010		ug/L	
			Total Calcium (Ca)	2019/06/08	<100		ug/L	
			Total Chromium (Cr)	2019/06/08	<1.0		ug/L	
			Total Cobalt (Co)	2019/06/08	<0.40		ug/L	
			Total Copper (Cu)	2019/06/08	<0.50		ug/L	
			Total Iron (Fe)	2019/06/08	<50		ug/L	
			Total Lead (Pb)	2019/06/08	<0.50		ug/L	
			Total Magnesium (Mg)	2019/06/08	<100		ug/L	
			Total Manganese (Mn)	2019/06/08	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/06/08	<2.0		ug/L	
			Total Nickel (Ni)	2019/06/08	<2.0		ug/L	
			Total Phosphorus (P)	2019/06/08	<100		ug/L	
			Total Potassium (K)	2019/06/08	<100		ug/L	
			Total Selenium (Se)	2019/06/08	<1.0		ug/L	
			Total Silver (Ag)	2019/06/08	<0.10		ug/L	
			Total Sodium (Na)	2019/06/08	<100		ug/L	
			Total Strontium (Sr)	2019/06/08	<2.0		ug/L	
			Total Thallium (Tl)	2019/06/08	<0.10		ug/L	
			Total Tin (Sn)	2019/06/08	<2.0		ug/L	
			Total Titanium (Ti)	2019/06/08	<2.0		ug/L	
			Total Uranium (U)	2019/06/08	<0.10		ug/L	
			Total Vanadium (V)	2019/06/08	<2.0		ug/L	
			Total Zirconium (Zr)	2019/06/08	<2.0		ug/L	
			Total Zinc (Zn)	2019/06/08	<5.0		ug/L	
6163752	BAN	RPD	Total Aluminum (Al)	2019/06/08	1.8		%	20
6163756	EMT	QC Standard	Turbidity	2019/06/07		113	%	80 - 120
6163756	EMT	Spiked Blank	Turbidity	2019/06/07		98	%	80 - 120
6163756	EMT	Method Blank	Turbidity	2019/06/07	<0.10		NTU	
6163756	EMT	RPD	Turbidity	2019/06/07	7.4		%	20
6163903	SRM	Spiked Blank	Colour	2019/06/07		101	%	80 - 120
6163903	SRM	Method Blank	Colour	2019/06/07	<5.0		TCU	
6163903	SRM	RPD [JXF850-01]	Colour	2019/06/07	7.5		%	20
6163906	SRM	Spiked Blank	Colour	2019/06/07		94	%	80 - 120
6163906	SRM	Method Blank	Colour	2019/06/07	<5.0		TCU	
6163906	SRM	RPD	Colour	2019/06/07	NC		%	20
6163907	SRM	Spiked Blank	Colour	2019/06/07		96	%	80 - 120
6163907	SRM	Method Blank	Colour	2019/06/07	<5.0		TCU	
6163907	SRM	RPD [JXF881-01]	Colour	2019/06/07	NC		%	20
6163926	SRM	Matrix Spike [JXF881-01]	Orthophosphate (P)	2019/06/07		93	%	80 - 120
6163926	SRM	Spiked Blank	Orthophosphate (P)	2019/06/07		92	%	80 - 120
6163926	SRM	Method Blank	Orthophosphate (P)	2019/06/07	<0.010		mg/L	
6163926	SRM	RPD [JXF881-01]	Orthophosphate (P)	2019/06/07	NC		%	25
6163930	SRM	Matrix Spike	Orthophosphate (P)	2019/06/07		NC	%	80 - 120
6163930	SRM	Spiked Blank	Orthophosphate (P)	2019/06/07		94	%	80 - 120
6163930	SRM	Method Blank	Orthophosphate (P)	2019/06/07	<0.010		mg/L	
6163930	SRM	RPD	Orthophosphate (P)	2019/06/07	0.53		%	25
6163933	SRM	Matrix Spike [JXF850-01]	Orthophosphate (P)	2019/06/07		89	%	80 - 120
6163933	SRM	Spiked Blank	Orthophosphate (P)	2019/06/07		91	%	80 - 120
6163933	SRM	Method Blank	Orthophosphate (P)	2019/06/07	<0.010		mg/L	
6163933	SRM	RPD [JXF850-01]	Orthophosphate (P)	2019/06/07	NC		%	25
6163938	KMC	Matrix Spike	Total Organic Carbon (C)	2019/06/07		98	%	85 - 115
6163938	KMC	Spiked Blank	Total Organic Carbon (C)	2019/06/07		99	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6163938	KMC	Method Blank	Total Organic Carbon (C)	2019/06/07	<0.50		mg/L	
	6163938	KMC	RPD	Total Organic Carbon (C)	2019/06/07	3.7		%	15
	6163961	BAN	Matrix Spike [JXF852-02]	Dissolved Aluminum (Al)	2019/06/07		99	%	80 - 120
				Dissolved Antimony (Sb)	2019/06/07		92	%	80 - 120
				Dissolved Arsenic (As)	2019/06/07		96	%	80 - 120
				Dissolved Barium (Ba)	2019/06/07		98	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/07		100	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/07		94	%	80 - 120
				Dissolved Boron (B)	2019/06/07		98	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/07		97	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/07		98	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/07		97	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/07		99	%	80 - 120
				Dissolved Copper (Cu)	2019/06/07		97	%	80 - 120
				Dissolved Iron (Fe)	2019/06/07		98	%	80 - 120
				Dissolved Lead (Pb)	2019/06/07		99	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/07		104	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/07		97	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/06/07		97	%	80 - 120
				Dissolved Nickel (Ni)	2019/06/07		98	%	80 - 120
				Dissolved Phosphorus (P)	2019/06/07		103	%	80 - 120
				Dissolved Potassium (K)	2019/06/07		101	%	80 - 120
				Dissolved Selenium (Se)	2019/06/07		97	%	80 - 120
				Dissolved Silver (Ag)	2019/06/07		97	%	80 - 120
				Dissolved Sodium (Na)	2019/06/07		96	%	80 - 120
				Dissolved Strontium (Sr)	2019/06/07		98	%	80 - 120
				Dissolved Thallium (Tl)	2019/06/07		100	%	80 - 120
				Dissolved Tin (Sn)	2019/06/07		99	%	80 - 120
				Dissolved Titanium (Ti)	2019/06/07		104	%	80 - 120
				Dissolved Uranium (U)	2019/06/07		104	%	80 - 120
				Dissolved Vanadium (V)	2019/06/07		97	%	80 - 120
				Dissolved Zirconium (Zr)	2019/06/07		102	%	80 - 120
				Dissolved Zinc (Zn)	2019/06/07		99	%	80 - 120
	6163961	BAN	Spiked Blank	Dissolved Aluminum (Al)	2019/06/07		99	%	80 - 120
				Dissolved Antimony (Sb)	2019/06/07		91	%	80 - 120
				Dissolved Arsenic (As)	2019/06/07		98	%	80 - 120
				Dissolved Barium (Ba)	2019/06/07		98	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/07		100	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/07		95	%	80 - 120
				Dissolved Boron (B)	2019/06/07		101	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/07		98	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/07		99	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/07		97	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/07		99	%	80 - 120
				Dissolved Copper (Cu)	2019/06/07		99	%	80 - 120
				Dissolved Iron (Fe)	2019/06/07		101	%	80 - 120
				Dissolved Lead (Pb)	2019/06/07		100	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/07		105	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/07		101	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/06/07		99	%	80 - 120
				Dissolved Nickel (Ni)	2019/06/07		99	%	80 - 120
				Dissolved Phosphorus (P)	2019/06/07		103	%	80 - 120
				Dissolved Potassium (K)	2019/06/07		104	%	80 - 120
				Dissolved Selenium (Se)	2019/06/07		97	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2019/06/07		96	%	80 - 120
			Dissolved Sodium (Na)	2019/06/07		98	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/07		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/07		100	%	80 - 120
			Dissolved Tin (Sn)	2019/06/07		97	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/07		101	%	80 - 120
			Dissolved Uranium (U)	2019/06/07		105	%	80 - 120
			Dissolved Vanadium (V)	2019/06/07		98	%	80 - 120
			Dissolved Zirconium (Zr)	2019/06/07		102	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/07		100	%	80 - 120
6163961	BAN	Method Blank	Dissolved Aluminum (Al)	2019/06/07	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/06/07	<1.0		ug/L	
			Dissolved Arsenic (As)	2019/06/07	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/06/07	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/06/07	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/06/07	<2.0		ug/L	
			Dissolved Boron (B)	2019/06/07	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/06/07	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/06/07	<100		ug/L	
			Dissolved Chromium (Cr)	2019/06/07	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/06/07	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/06/07	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/06/07	<50		ug/L	
			Dissolved Lead (Pb)	2019/06/07	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/06/07	<100		ug/L	
			Dissolved Manganese (Mn)	2019/06/07	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/06/07	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/06/07	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/06/07	<100		ug/L	
			Dissolved Potassium (K)	2019/06/07	<100		ug/L	
			Dissolved Selenium (Se)	2019/06/07	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/06/07	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/06/07	<100		ug/L	
			Dissolved Strontium (Sr)	2019/06/07	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/06/07	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/06/07	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/06/07	<2.0		ug/L	
			Dissolved Uranium (U)	2019/06/07	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/06/07	<2.0		ug/L	
			Dissolved Zirconium (Zr)	2019/06/07	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/06/07	<5.0		ug/L	
6163961	BAN	RPD [JXF852-02]	Dissolved Aluminum (Al)	2019/06/07	1.4		%	20
			Dissolved Antimony (Sb)	2019/06/07	NC		%	20
			Dissolved Arsenic (As)	2019/06/07	0.36		%	20
			Dissolved Barium (Ba)	2019/06/07	2.1		%	20
			Dissolved Beryllium (Be)	2019/06/07	NC		%	20
			Dissolved Bismuth (Bi)	2019/06/07	NC		%	20
			Dissolved Boron (B)	2019/06/07	NC		%	20
			Dissolved Cadmium (Cd)	2019/06/07	18		%	20
			Dissolved Calcium (Ca)	2019/06/07	1.7		%	20
			Dissolved Chromium (Cr)	2019/06/07	NC		%	20
			Dissolved Cobalt (Co)	2019/06/07	NC		%	20
			Dissolved Copper (Cu)	2019/06/07	0.49		%	20
			Dissolved Iron (Fe)	2019/06/07	0.45		%	20



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Lead (Pb)	2019/06/07	NC		%	20
			Dissolved Magnesium (Mg)	2019/06/07	0.81		%	20
			Dissolved Manganese (Mn)	2019/06/07	2.6		%	20
			Dissolved Molybdenum (Mo)	2019/06/07	NC		%	20
			Dissolved Nickel (Ni)	2019/06/07	NC		%	20
			Dissolved Phosphorus (P)	2019/06/07	NC		%	20
			Dissolved Potassium (K)	2019/06/07	6.0		%	20
			Dissolved Selenium (Se)	2019/06/07	NC		%	20
			Dissolved Silver (Ag)	2019/06/07	NC		%	20
			Dissolved Sodium (Na)	2019/06/07	1.8		%	20
			Dissolved Strontium (Sr)	2019/06/07	1.7		%	20
			Dissolved Thallium (Tl)	2019/06/07	NC		%	20
			Dissolved Tin (Sn)	2019/06/07	NC		%	20
			Dissolved Titanium (Ti)	2019/06/07	NC		%	20
			Dissolved Uranium (U)	2019/06/07	NC		%	20
			Dissolved Vanadium (V)	2019/06/07	NC		%	20
			Dissolved Zirconium (Zr)	2019/06/07	NC		%	20
			Dissolved Zinc (Zn)	2019/06/07	NC		%	20
6163996	EMT	QC Standard	Turbidity	2019/06/07		112	%	80 - 120
6163996	EMT	Spiked Blank	Turbidity	2019/06/07		98	%	80 - 120
6163996	EMT	Method Blank	Turbidity	2019/06/07	<0.10		NTU	
6163996	EMT	RPD	Turbidity	2019/06/07	7.0		%	20
6164137	EMT	QC Standard	pH	2019/06/10		101	%	97 - 103
6164137	EMT	RPD	pH	2019/06/10	0.71		%	N/A
6164141	EMT	Spiked Blank	Conductivity	2019/06/10		102	%	80 - 120
6164141	EMT	Method Blank	Conductivity	2019/06/10	<1.0		uS/cm	
6164141	EMT	RPD	Conductivity	2019/06/10	0.00016		%	10
6166270	TNG	Matrix Spike [JXF862-05]	Dissolved Tungsten (W)	2019/06/11		103	%	80 - 120
6166270	TNG	Spiked Blank	Dissolved Tungsten (W)	2019/06/11		99	%	80 - 120
6166270	TNG	Method Blank	Dissolved Tungsten (W)	2019/06/11	<1.0		ug/L	
6166270	TNG	RPD [JXF862-05]	Dissolved Tungsten (W)	2019/06/11	NC		%	20
6167129	BBD	Matrix Spike	Acidity	2019/06/10		97	%	80 - 120
6167129	BBD	Spiked Blank	Acidity	2019/06/10		101	%	80 - 120
6167129	BBD	Method Blank	Acidity	2019/06/10	<5.0		mg/L	
6167129	BBD	RPD	Acidity	2019/06/10	NC		%	25
6167151	EMT	QC Standard	Turbidity	2019/06/10		115	%	80 - 120
6167151	EMT	Spiked Blank	Turbidity	2019/06/10		99	%	80 - 120
6167151	EMT	Method Blank	Turbidity	2019/06/10	<0.10		NTU	
6167151	EMT	RPD	Turbidity	2019/06/10	0.28		%	20
6167185	MCN	Matrix Spike	Total Phosphorus	2019/06/11		100	%	N/A
6167185	MCN	Spiked Blank	Total Phosphorus	2019/06/11		98	%	80 - 120
6167185	MCN	Method Blank	Total Phosphorus	2019/06/11	<0.020		mg/L	
6167185	MCN	RPD	Total Phosphorus	2019/06/11	NC		%	25
6167368	SRM	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/06/10		NC	%	80 - 120
6167368	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/10		98	%	80 - 120
6167368	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/10	<5.0		mg/L	
6167368	SRM	RPD	Total Alkalinity (Total as CaCO3)	2019/06/10	1.7		%	25
6167369	SRM	Matrix Spike [JXF881-01]	Total Alkalinity (Total as CaCO3)	2019/06/10		95	%	80 - 120
6167369	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/10		94	%	80 - 120
6167369	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/10	<5.0		mg/L	
6167369	SRM	RPD [JXF881-01]	Total Alkalinity (Total as CaCO3)	2019/06/10	NC		%	25
6167410	MLB	Matrix Spike [JXF882-06]	Dissolved Aluminum (Al)	2019/06/11		101	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/11		97	%	80 - 120
			Dissolved Arsenic (As)	2019/06/11		97	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Dissolved Barium (Ba)	2019/06/11		100	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
				Dissolved Boron (B)	2019/06/11		104	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/11		98	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/11		100	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/11		97	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/11		98	%	80 - 120
				Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
				Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
				Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/11		106	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/06/11		98	%	80 - 120
				Dissolved Nickel (Ni)	2019/06/11		98	%	80 - 120
				Dissolved Phosphorus (P)	2019/06/11		104	%	80 - 120
				Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
				Dissolved Selenium (Se)	2019/06/11		96	%	80 - 120
				Dissolved Silver (Ag)	2019/06/11		96	%	80 - 120
				Dissolved Sodium (Na)	2019/06/11		101	%	80 - 120
				Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
				Dissolved Thallium (Tl)	2019/06/11		101	%	80 - 120
				Dissolved Tin (Sn)	2019/06/11		98	%	80 - 120
				Dissolved Titanium (Ti)	2019/06/11		100	%	80 - 120
				Dissolved Uranium (U)	2019/06/11		103	%	80 - 120
				Dissolved Vanadium (V)	2019/06/11		101	%	80 - 120
				Dissolved Zinc (Zn)	2019/06/11		99	%	80 - 120
6167410	MLB		Spiked Blank	Dissolved Aluminum (Al)	2019/06/11		102	%	80 - 120
				Dissolved Antimony (Sb)	2019/06/11		96	%	80 - 120
				Dissolved Arsenic (As)	2019/06/11		96	%	80 - 120
				Dissolved Barium (Ba)	2019/06/11		99	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
				Dissolved Boron (B)	2019/06/11		107	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/11		97	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/11		99	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/11		95	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/11		96	%	80 - 120
				Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
				Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
				Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/11		103	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/06/11		102	%	80 - 120
				Dissolved Nickel (Ni)	2019/06/11		96	%	80 - 120
				Dissolved Phosphorus (P)	2019/06/11		103	%	80 - 120
				Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
				Dissolved Selenium (Se)	2019/06/11		97	%	80 - 120
				Dissolved Silver (Ag)	2019/06/11		97	%	80 - 120
				Dissolved Sodium (Na)	2019/06/11		97	%	80 - 120
				Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
				Dissolved Thallium (Tl)	2019/06/11		102	%	80 - 120
				Dissolved Tin (Sn)	2019/06/11		99	%	80 - 120
				Dissolved Titanium (Ti)	2019/06/11		102	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
6167410	MLB	Method Blank	Dissolved Uranium (U)	2019/06/11		103	%	80 - 120	
			Dissolved Vanadium (V)	2019/06/11		100	%	80 - 120	
			Dissolved Zinc (Zn)	2019/06/11		98	%	80 - 120	
			Dissolved Aluminum (Al)	2019/06/11	<5.0			ug/L	
			Dissolved Antimony (Sb)	2019/06/11	<1.0			ug/L	
			Dissolved Arsenic (As)	2019/06/11	<1.0			ug/L	
			Dissolved Barium (Ba)	2019/06/11	<1.0			ug/L	
			Dissolved Beryllium (Be)	2019/06/11	<1.0			ug/L	
			Dissolved Bismuth (Bi)	2019/06/11	<2.0			ug/L	
			Dissolved Boron (B)	2019/06/11	<50			ug/L	
			Dissolved Cadmium (Cd)	2019/06/11	<0.010			ug/L	
			Dissolved Calcium (Ca)	2019/06/11	<100			ug/L	
			Dissolved Chromium (Cr)	2019/06/11	<1.0			ug/L	
			Dissolved Cobalt (Co)	2019/06/11	<0.40			ug/L	
			Dissolved Copper (Cu)	2019/06/11	<0.50			ug/L	
			Dissolved Iron (Fe)	2019/06/11	<50			ug/L	
			Dissolved Lead (Pb)	2019/06/11	<0.50			ug/L	
			Dissolved Magnesium (Mg)	2019/06/11	<100			ug/L	
			Dissolved Manganese (Mn)	2019/06/11	<2.0			ug/L	
			Dissolved Molybdenum (Mo)	2019/06/11	<2.0			ug/L	
			Dissolved Nickel (Ni)	2019/06/11	<2.0			ug/L	
			Dissolved Phosphorus (P)	2019/06/11	<100			ug/L	
			Dissolved Potassium (K)	2019/06/11	<100			ug/L	
Dissolved Selenium (Se)	2019/06/11	<1.0			ug/L				
Dissolved Silver (Ag)	2019/06/11	<0.10			ug/L				
Dissolved Sodium (Na)	2019/06/11	<100			ug/L				
Dissolved Strontium (Sr)	2019/06/11	<2.0			ug/L				
Dissolved Thallium (Tl)	2019/06/11	<0.10			ug/L				
Dissolved Tin (Sn)	2019/06/11	<2.0			ug/L				
Dissolved Titanium (Ti)	2019/06/11	<2.0			ug/L				
Dissolved Uranium (U)	2019/06/11	<0.10			ug/L				
Dissolved Vanadium (V)	2019/06/11	<2.0			ug/L				
Dissolved Zinc (Zn)	2019/06/11	<5.0			ug/L				
6167410	MLB	RPD [JXF882-06]	Dissolved Aluminum (Al)	2019/06/11	NC		%	20	
			Dissolved Antimony (Sb)	2019/06/11	NC		%	20	
			Dissolved Arsenic (As)	2019/06/11	NC		%	20	
			Dissolved Barium (Ba)	2019/06/11	NC		%	20	
			Dissolved Beryllium (Be)	2019/06/11	NC		%	20	
			Dissolved Bismuth (Bi)	2019/06/11	NC		%	20	
			Dissolved Boron (B)	2019/06/11	NC		%	20	
			Dissolved Cadmium (Cd)	2019/06/11	NC		%	20	
			Dissolved Calcium (Ca)	2019/06/11	NC		%	20	
			Dissolved Chromium (Cr)	2019/06/11	NC		%	20	
			Dissolved Cobalt (Co)	2019/06/11	NC		%	20	
			Dissolved Copper (Cu)	2019/06/11	NC		%	20	
			Dissolved Iron (Fe)	2019/06/11	NC		%	20	
			Dissolved Lead (Pb)	2019/06/11	NC		%	20	
			Dissolved Magnesium (Mg)	2019/06/11	NC		%	20	
			Dissolved Manganese (Mn)	2019/06/11	NC		%	20	
			Dissolved Molybdenum (Mo)	2019/06/11	NC		%	20	
Dissolved Nickel (Ni)	2019/06/11	NC		%	20				
Dissolved Phosphorus (P)	2019/06/11	NC		%	20				
Dissolved Potassium (K)	2019/06/11	NC		%	20				
Dissolved Selenium (Se)	2019/06/11	NC		%	20				



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2019/06/11	NC		%	20
			Dissolved Sodium (Na)	2019/06/11	NC		%	20
			Dissolved Strontium (Sr)	2019/06/11	NC		%	20
			Dissolved Thallium (Tl)	2019/06/11	NC		%	20
			Dissolved Tin (Sn)	2019/06/11	NC		%	20
			Dissolved Titanium (Ti)	2019/06/11	NC		%	20
			Dissolved Uranium (U)	2019/06/11	NC		%	20
			Dissolved Vanadium (V)	2019/06/11	NC		%	20
			Dissolved Zinc (Zn)	2019/06/11	NC		%	20
6167418	MCN	Matrix Spike [JXF850-01]	Total Alkalinity (Total as CaCO3)	2019/06/10		95	%	80 - 120
6167418	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/10		98	%	80 - 120
6167418	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/10	<5.0		mg/L	
6167418	MCN	RPD [JXF850-01]	Total Alkalinity (Total as CaCO3)	2019/06/10	NC		%	25
6167473	EMT	QC Standard	pH	2019/06/11		101	%	97 - 103
6167473	EMT	RPD [JXF861-04]	pH	2019/06/11	2.5		%	N/A
6167477	EMT	Spiked Blank	Conductivity	2019/06/11		102	%	80 - 120
6167477	EMT	Method Blank	Conductivity	2019/06/11	<1.0		uS/cm	
6167477	EMT	RPD [JXF861-04]	Conductivity	2019/06/11	0.00087		%	10
6167478	EMT	Matrix Spike [JXF861-04]	Dissolved Fluoride (F-)	2019/06/11		60 (1)	%	80 - 120
6167478	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/11		96	%	80 - 120
6167478	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/11	<0.10		mg/L	
6167478	EMT	RPD [JXF861-04]	Dissolved Fluoride (F-)	2019/06/11	NC		%	20
6167479	SSI	Matrix Spike	Dissolved Organic Carbon (C)	2019/06/10		89	%	85 - 115
6167479	SSI	Spiked Blank	Dissolved Organic Carbon (C)	2019/06/10		95	%	80 - 120
6167479	SSI	Method Blank	Dissolved Organic Carbon (C)	2019/06/10	<0.5		mg/L	
6167479	SSI	RPD	Dissolved Organic Carbon (C)	2019/06/10	11		%	15
6167490	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/10		92	%	85 - 115
6167490	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/10		96	%	80 - 120
6167490	SSI	Method Blank	Total Organic Carbon (C)	2019/06/10	<0.50		mg/L	
6167490	SSI	RPD	Total Organic Carbon (C)	2019/06/10	2.9		%	15
6167491	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/10		91	%	85 - 115
6167491	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/10		97	%	80 - 120
6167491	SSI	Method Blank	Total Organic Carbon (C)	2019/06/10	<0.50		mg/L	
6167491	SSI	RPD	Total Organic Carbon (C)	2019/06/10	6.3		%	15
6167493	EMT	QC Standard	pH	2019/06/11		101	%	97 - 103
6167493	EMT	RPD [JXF881-01]	pH	2019/06/11	4.6 (2)		%	N/A
6167498	EMT	Spiked Blank	Conductivity	2019/06/11		100	%	80 - 120
6167498	EMT	Method Blank	Conductivity	2019/06/11	<1.0		uS/cm	
6167498	EMT	RPD [JXF881-01]	Conductivity	2019/06/11	3.4		%	10
6167502	EMT	QC Standard	pH	2019/06/11		101	%	97 - 103
6167502	EMT	RPD [JXF850-01]	pH	2019/06/11	3.7		%	N/A
6167504	EMT	Spiked Blank	Conductivity	2019/06/11		103	%	80 - 120
6167504	EMT	Method Blank	Conductivity	2019/06/11	<1.0		uS/cm	
6167504	EMT	RPD [JXF850-01]	Conductivity	2019/06/11	1.8		%	10
6167558	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/06/10		102	%	80 - 120
6167558	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10		107	%	80 - 120
6167558	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10	<0.050		mg/L	
6167558	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2019/06/10	19		%	20
6167568	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/06/10		101	%	80 - 120
6167568	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10		105	%	80 - 120
6167568	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10	<0.050		mg/L	
6167568	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2019/06/10	NC		%	20
6168856	LHA	Matrix Spike	Total Cyanide (CN)	2019/06/10		91	%	80 - 120
6168856	LHA	Spiked Blank	Total Cyanide (CN)	2019/06/10		90	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6168856	LHA	Method Blank	Total Cyanide (CN)	2019/06/10	<0.0050		mg/L	
6168856	LHA	RPD	Total Cyanide (CN)	2019/06/10	NC		%	20
6169233	BBD	QC Standard	Salinity	2019/06/11		102	%	80 - 120
6169233	BBD	Method Blank	Salinity	2019/06/11	<2.0		N/A	
6169233	BBD	RPD	Salinity	2019/06/11	NC		%	25
6169592	SRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/06/11		99	%	80 - 120
6169592	SRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/06/11		101	%	80 - 120
6169592	SRM	Method Blank	Dissolved Chloride (Cl-)	2019/06/11	<1.0		mg/L	
6169592	SRM	RPD	Dissolved Chloride (Cl-)	2019/06/11	0.64		%	25
6169595	SRM	Matrix Spike	Dissolved Sulphate (SO4)	2019/06/11		106	%	80 - 120
6169595	SRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/06/11		108	%	80 - 120
6169595	SRM	Method Blank	Dissolved Sulphate (SO4)	2019/06/11	<2.0		mg/L	
6169595	SRM	RPD	Dissolved Sulphate (SO4)	2019/06/11	1.4		%	25
6169597	SRM	Matrix Spike	Reactive Silica (SiO2)	2019/06/11		97	%	80 - 120
6169597	SRM	Spiked Blank	Reactive Silica (SiO2)	2019/06/11		99	%	80 - 120
6169597	SRM	Method Blank	Reactive Silica (SiO2)	2019/06/11	<0.50		mg/L	
6169597	SRM	RPD	Reactive Silica (SiO2)	2019/06/11	5.5		%	25
6169609	SRM	Matrix Spike	Nitrate + Nitrite (N)	2019/06/11		96	%	80 - 120
6169609	SRM	Spiked Blank	Nitrate + Nitrite (N)	2019/06/11		99	%	80 - 120
6169609	SRM	Method Blank	Nitrate + Nitrite (N)	2019/06/11	<0.050		mg/L	
6169609	SRM	RPD	Nitrate + Nitrite (N)	2019/06/11	1.4		%	25
6169610	SRM	Matrix Spike	Nitrite (N)	2019/06/11		96	%	80 - 120
6169610	SRM	Spiked Blank	Nitrite (N)	2019/06/11		100	%	80 - 120
6169610	SRM	Method Blank	Nitrite (N)	2019/06/11	<0.010		mg/L	
6169610	SRM	RPD	Nitrite (N)	2019/06/11	NC		%	20
6169817	BKE	Matrix Spike	Total Cyanide (CN)	2019/06/11		105	%	80 - 120
6169817	BKE	Spiked Blank	Total Cyanide (CN)	2019/06/11		100	%	80 - 120
6169817	BKE	Method Blank	Total Cyanide (CN)	2019/06/11	<0.0050		mg/L	
6169817	BKE	RPD	Total Cyanide (CN)	2019/06/11	4.6		%	20
6170191	LHA	Matrix Spike [JXF877-12]	Total Cyanide (CN)	2019/06/12		95	%	80 - 120
6170191	LHA	Spiked Blank	Total Cyanide (CN)	2019/06/12		98	%	80 - 120
6170191	LHA	Method Blank	Total Cyanide (CN)	2019/06/12	<0.0050		mg/L	
6170191	LHA	RPD [JXF877-12]	Total Cyanide (CN)	2019/06/12	NC		%	20
6170231	AM6	QC Standard	Total Dissolved Solids	2019/06/12		98	%	80 - 120
6170231	AM6	Method Blank	Total Dissolved Solids	2019/06/12	<20 (3)		mg/L	
6170231	AM6	RPD	Total Dissolved Solids	2019/06/12	0		%	25
6170572	SHC	Spiked Blank	Radium-226	2019/06/20		110	%	85 - 115
6170572	SHC	Method Blank	Radium-226	2019/06/20	<0.010		Bq/L	
6170572	SHC	RPD	Radium-226	2019/06/20	NC		%	N/A
6170626	TNG	Matrix Spike	Total Tungsten (W)	2019/06/12		100	%	80 - 120
6170626	TNG	Spiked Blank	Total Tungsten (W)	2019/06/12		99	%	80 - 120
6170626	TNG	Method Blank	Total Tungsten (W)	2019/06/12	<1.0		ug/L	
6192962	éFQ	Spiked Blank	WAD Cyanide (Free)	2019/06/16		94	%	80 - 120



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VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6192962	éFQ	Method Blank	WAD Cyanide (Free)	2019/06/16	<0.0030		mg/L	
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>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)</p> <p>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).</p> <p>(1) Low matrix spike recovery due to sample matrix interference.</p> <p>(2) Poor duplicate agreement due to sample matrix, results confirmed by repeat analysis.</p> <p>(3) Elevated RDL due to method blank performance.</p>									



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VERITAS

BV Labs Job #: B9F1476
Report Date: 2019/06/26

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

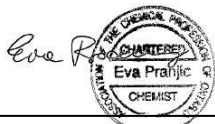


Caroline Bougie

Caroline Bougie, B.Sc. Chemist

Eric Dearman

Eric Dearman, Scientific Specialist



Ewa Pranjic

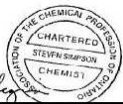
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Gina Thompson

Gina Thompson, Inorganics General Chemistry Supervisor

Mike MacGillivray

Mike MacGillivray, Scientific Specialist (Inorganics)



Steven Simpson

Steven Simpson, Lab Director

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**DALHOUSIE
UNIVERSITY**

Inspiring Minds

Department of Oceanography
1355 Oxford St
Halifax, NS
B3H 4R2

Determination of chlorophyll a by fluorescence

Client: Bureau Veritas Laboratories, 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Received: 2019-06-06

Project #: B9F1476

Completed: 2019-06-11

Hugh MacIntyre

Hugh MacIntyre, Ph.D.

Chl *a* (chlorophyll *a*; $\mu\text{g L}^{-1}$) determined by the acidification method (Holm-Hansen et al., 1965). Estimates made with the non-acidification method (Welschmeyer, 1994) are shown for comparison.

The non-acidification method is considered more reliable than the acidification method in correcting for bias due to the contributions of chlorophyll *b* and chlorophyll degradation products.

Holm-Hansen O, Lorenzen CJ, Holmes RW, Strickland JDH (1965) Fluorometric determination of chlorophyll.

J Conseil 30:3-15

Welschmeyer NA (1994) Fluorometric analysis of chlorophyll *a* in the presence of chlorophyll *b* and phaeopigments.

Limnol Oceanogr 39:1985-1992

Contractor ID	Client ID	Chl <i>a</i> (acidification)	Chl <i>a</i> (non-acidification)
JXF834-02R	SW 1	1.63	1.49
JXF851-02R	SW 4	1.45	1.28
JXF853-02R	SW 5	1.8	1.72
JXF859-02R	SW 8	2.58	2.43
JXF861-02R	SW 9	2.65	2.56
JXF863-02R	SW 16	1.76	1.77
JXF877-02R	FMS DUP 2	1.58	1.58
JXF880-02R	FIELD/FILTER BLANK 2	0.339	0.283



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628		
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream	B9F1476	719758
Phone	(902) 384-2772 Fax (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		Chain Of Custody Record	Project Manager
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			
				Sampled By			Maryann Comeau

Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)											Turnaround Time (TAT) Required:		
		Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	Please provide advance notice for rush projects	
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal														Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. <input type="checkbox"/>	
														Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.	
														Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required: <input type="checkbox"/>	

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 1	19/06/04	9:20	H ₂ O			/	/	/	/	/	/	/	/	/	/		
2	SW 4	"	8:50	"			/	/	/	/	/	/	/	/	/	/		
3	SW 5	"	10:40	"			/	/	/	/	/	/	/	/	/	/		
4	SW 8	"	12:10	"			/	/	/	/	/	/	/	/	/	/		
5	SW 9	"	11:30	"			/	/	/	/	/	/	/	/	/	/		
6	SW 16	"	9:50	"			/	/	/	/	/	/	/	/	/	/		
7	FMS Dup 2	"	"	"			/	/	/	/	/	/	/	/	/	/		2019 JUN 4 15:08
8	Field/Filter Blank 2	"	"	"			/	/	/	/	/	/	/	/	/	/		
9	Trip Blank	"	"	"			/	/	/	/	/	/	/	/	/	/		
10																		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# Jars used and not submitted	Lab Use Only
<i>Ryan Gardiner</i> Ryan Gardiner	19/06/04		<i>VBW</i>				Time Sensitive <input type="checkbox"/> Temperature (°C) on Receipt <input type="checkbox"/> Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
 * IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel: (902) 420-0203 Toll-free: 800-563-6286 Fax: (902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Quotation #: B83573	Maxxam Job #: B9F1476	Bottle Order #:	719798		
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner	P.O. #: 5628	Project Name: Fifteen Mile Stream	Chain Of Custody Record	Project Manager		
Address: 6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address: 2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Site #:	Sampled By:	Maryann Comeau		C#719798-03-02	
Phone: (902) 384-2772 Fax: (902) 384-2772	Phone: (902) 880-6375 Fax:						
Email: accounts@atlanticgoldcorporation.com	Email: ryan@mccallumenvironmental.com						

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required: Please provide advance notice for rush projects		
		Field Filtered & Preserved	Lab Filtration Required	Phosphorus Total Colour/Imetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al: RCAP-MS Diss(FieldFit) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CYAALL)	Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests.	<input type="checkbox"/>

** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
 Date Required: Time Required:

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Phosphorus Total Colour/Imetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al: RCAP-MS Diss(FieldFit) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CYAALL)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 1	19/06/04	9:20	H ₂ O													
2	SW 4	"	8:50	"													
3	SW 5	"	10:40	"													
4	SW 8	"	12:10	"													
5	SW 9	"	11:30	"													
6	SW 16	"	9:50	"													
7	FMS Dup 2	"		"													
8	Field/Filter Blank 2	"		"													
9	Trip Blank	"		"													
10																	

RELINQUISHED BY: (Signature/Print) R. Gardiner / Ryan Gardiner	Date: (YY/MM/DD) 19/06/04	Time	RECEIVED BY: (Signature/Print) [Signature]	Date: (YY/MM/DD)	Time	# Jars used and not submitted	Lab Use Only	
						Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
						<input type="checkbox"/>		<input type="checkbox"/> Yes <input type="checkbox"/> No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Methyl Mercury Results

Flett Research Ltd.

440 DeSalaberry Ave. Winnipeg, MB R2L 0Y7
Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR061919JS1
Page 1 of 1

CLIENT: Bureau Veritas - Bedford: B9F1476

200 Bluewater Road, Suite 105
Bedford, NS B4B 1G9

Date Received: June 7, 2019

Sampling Date: June 4, 2019

Matrix: Water

Transaction ID: 894

PO/Contract No.:

Date Analysed: June 19, 2019

Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 2)

Comments: Samples had particulates present.

Detection Limit: The method detection limit (MDL) for this method is 0.0035 ng/L. The MDL is the minimum concentration that can be reported with 99% confidence that the measured concentration exceeds zero and is based on the distillation of 45mL of raw sample and analysis of 20mL of a 40mL distillate.

For reporting purpose samples are flagged when concentration is below the methods EPA defined minimum level (ML= 0.0135 ng/L). As concentration rises above the MDL confidence that the analyte is present approaches 100% at and above the ML.

Estimated Uncertainty: Overall estimated uncertainty (95 % confidence, K=2) of this method varies with analyte concentration. When methyl mercury concentrations exceed 0.03ng/L the estimated uncertainty is ±15%. At a concentration of 0.01ng/L uncertainty is ± 23%. Method uncertainty for concentrations at MDL (0.0035ng/L) is ±75%.

Results authorized by Dr. Robert J. Flett, Chief Scientist

Blanks		Pg of CH3Hg in the Ethylation Blank	Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L)					
Ethylation blank (H ₂ O+Reagents)		0.12	9.54	0.004	assumes volume is 30mL				
Mean Eth. Blank (last 30 runs)		0.11							
		Net Pg CH3Hg in the Method Blank (Eth. Blank subtracted)	Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) (Eth. Blank subtracted)					
Method Blank 1		0.32	35.53	0.013					
Method Blank 2		0.32	35.32	0.013					
Method Blank 3		0.27	31.23	0.011					
Mean Method Blank				0.012					
Mean Calibration Factor (area units / pg)		81.18 ± 1.8 %RSD							
Spike Recovery		Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)	
Matrix Spike (MS) and Matrix Spike Duplicate (MSD)		JXF834-15R (SW 1)	MS1	2396.05	47.78	100%	1.24	85.2	
		JXF834-15R (SW 1)	MS1D	2442.43	48.40	100%	1.27	89.4	
		Mean of Spike Recoveries							
								87.3	
QC Samples		MeOPR ID1701 (1000ng/L)	(beginning of run)	1097.42	0.050	100%	969	96.9	
Ongoing Precision & Recovery (OPR)		MeOPR ID1701 (1000ng/L)	(end of run)	937.50	0.050	100%	876	87.6	
		MeOPR ID1701 (1000ng/L)	(beginning of run)	1193.43	0.050	100%	932	93.2	
		MeOPR ID1701 (1000ng/L)	(end of run)	945.52	0.050	100%	931	93.1	
		Mean of MeOPR							
							927	92.7	
Alternate Source Standard (A.S.S)		A.S.S.-Alfa ID1302 (1000 ng/L)		2423.27		100%	991	99.1	
LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) (Ethylation & Method Blank subtracted) (recovery corrected)
95215	JXF834-15R	SW 1	June 4, 2019	09:20		716.88	48.11	87.3%	0.395
95216	JXF851-15R	SW 4	June 4, 2019	08:50		388.36	47.35	87.3%	0.221
95217	JXF853-15R	SW 5	June 4, 2019	10:40		757.70	47.39	87.3%	0.435
95218	JXF859-15R	SW 8	June 4, 2019	12:10		297.03	47.85	87.3%	0.157
95219	JXF861-15R	SW 9	June 4, 2019	11:30	DupA1	240.34	47.65	87.3%	0.125
95219	JXF861-15R	SW 9	June 4, 2019	11:30	DupA2	237.20	48.27	87.3%	0.118
95220	JXF863-15R	SW 16	June 4, 2019			429.55	49.10	87.3%	0.217
95221	JXF877-15R	FMS DUP 2	June 4, 2019			448.70	47.37	87.3%	0.233
95222	JXF880-15R	FIELD/FILTER BLANK 2	June 4, 2019			38.01	47.72	87.3%	<0.0035

Q:\Clients A-L\Bureau Veritas - Bedford\2019\894\Methyl Mercury\MTWATR061919JS1.xls

* See 'Comments' section above for discussion.

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Note: Results relate only to the items tested.

Dup = Duplicate - two subsamples of the same sample carried through the analytical procedure in an identical manner.



ISO/IEC 17025:2005 Accredited with the Canadian Association for Laboratory Accreditation

M10211.1 Version 05/17/19



Your P.O. #: 5628
 Your Project #: Fifteen Mile Stream
 Your C.O.C. #: 719798-04-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/06/25
 Report #: R5770996
 Version: 5 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F2843

Received: 2019/06/05, 15:45

Sample Matrix: Water
 # Samples Received: 7

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO3) in water (6)	4	N/A	2019/06/13		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	3	N/A	2019/06/11	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	4	N/A	2019/06/12	N/A	SM 23 4500-CO2 D
Alkalinity	7	N/A	2019/06/10	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	7	N/A	2019/06/11	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	4	N/A	2019/06/07	ATL SOP 00042	SM 23 5220D m
Colour	7	N/A	2019/06/07	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	3	2019/06/11	2019/06/11	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (7)	4	N/A	2019/06/11	ATL SOP 00203	SM 23 5310B m
Conductance - water	3	N/A	2019/06/11	ATL SOP 00004	SM 23 2510B m
Conductance - water	4	N/A	2019/06/12	ATL SOP 00004	SM 23 2510B m
Fluoride	3	N/A	2019/06/11	ATL SOP 00043	SM 23 4500-F- C m
Fluoride	1	N/A	2019/06/12	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	7	N/A	2019/06/10	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	3	2019/06/07	2019/06/07	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	4	2019/06/10	2019/06/10	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	3	N/A	2019/06/07	ATL SOP 00058	EPA 6020B R2 m
Metals Water Diss. MS (as rec'd)	1	N/A	2019/06/11	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	4	2019/06/07	2019/06/08	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	3	N/A	2019/06/11	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	3	N/A	2019/06/13	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	6	N/A	2019/06/12	N/A	Auto Calc.
Anion and Cation Sum	3	N/A	2019/06/11	N/A	Auto Calc.
Anion and Cation Sum	4	N/A	2019/06/12	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	3	2019/06/14	2019/06/16	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	7	N/A	2019/06/10	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	7	N/A	2019/06/11	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	7	N/A	2019/06/11	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	7	N/A	2019/06/12	ATL SOP 00018	ASTM D3867-16
pH (8)	3	N/A	2019/06/11	ATL SOP 00003	SM 23 4500-H+ B m
pH (8)	4	N/A	2019/06/12	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	7	N/A	2019/06/07	ATL SOP 00021	SM 23 4500-P E m



Your P.O. #: 5628
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 Your C.O.C. #: 719798-04-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/06/25
 Report #: R5770996
 Version: 5 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F2843

Received: 2019/06/05, 15:45

Sample Matrix: Water
 # Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Radium Isotopes by Alpha Spectrometry (3, 9)	3	N/A	2019/06/21	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (6)	4	N/A	2019/06/11		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	3	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	4	N/A	2019/06/12	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	3	N/A	2019/06/11	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	4	N/A	2019/06/12	ATL SOP 00049	Auto Calc.
Reactive Silica	7	N/A	2019/06/11	ATL SOP 00022	EPA 366.0 m
Sulphate	7	N/A	2019/06/11	ATL SOP 00023	ASTM D516-16 m
Chlorophyll A (Sub from Bedford) (4)	3	2019/06/09	2019/06/10		
Methyl Mercury (sub from Bedford) (5)	3	N/A	2019/06/18		EPA 1630
Total Dissolved Solids (Filt. Residue)	4	2019/06/07	2019/06/12	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	7	N/A	2019/06/12	N/A	Auto Calc.
Organic carbon - Total (TOC) (10)	2	N/A	2019/06/11	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (10)	5	N/A	2019/06/12	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	4	2019/06/10	2019/06/11	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	4	2019/06/07	2019/06/10	ATL SOP 00007	SM 23 2540D m
Turbidity	7	N/A	2019/06/10	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has 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 BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.



Your P.O. #: 5628
Your Project #: Fifteen Mile Stream
Your C.O.C. #: 719798-04-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/06/25
Report #: R5770996
Version: 5 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F2843

Received: 2019/06/05, 15:45

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 BV Labs, results relate to the supplied samples tested.

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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 Laboratories Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Bureau Veritas Laboratories Kitimat
- (4) This test was performed by Dalhousie Dept of Oceanography
- (5) This test was performed by Sub Bedford to Flett Research
- (6) Non-accredited test method
- (7) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (8) 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.
- (9) Radium-226 results have not been corrected for blanks.
- (10) 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.

Maryann Comeau, Project Manager
Email: Maryann.COMEAU@bvlabs.com
Phone# (902)420-0203 Ext:298

=====

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN059			JXN059		
Sampling Date		2019/06/05 10:15			2019/06/05 10:15		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	RDL	QC Batch	SW 13 SURFACE Lab-Dup	RDL	QC Batch

Calculated Parameters							
Anion Sum	me/L	0.180	N/A	6161440			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435			
Calculated TDS	mg/L	13	1.0	6161446			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435			
Cation Sum	me/L	0.170	N/A	6161440			
Hardness (CaCO3)	mg/L	2.5	1.0	6161436			
Ion Balance (% Difference)	%	2.86	N/A	6161439			
Langelier Index (@ 20C)	N/A	NC		6161443			
Langelier Index (@ 4C)	N/A	NC		6161445			
Nitrate (N)	mg/L	<0.050	0.050	6161412			
Saturation pH (@ 20C)	N/A	NC		6161443			
Saturation pH (@ 4C)	N/A	NC		6161445			
Inorganics							
Acidity	mg/L	<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167369			
Total Chemical Oxygen Demand	mg/L	<20	20	6163788	23	20	6163788
Dissolved Chloride (Cl-)	mg/L	3.5	1.0	6169558			
Colour	TCU	64	25	6163907			
Total Dissolved Solids	mg/L	29	10	6170231			
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6169240			
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169571			
Nitrite (N)	mg/L	<0.010	0.010	6169570			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167568	<0.050	0.050	6167568
Total Organic Carbon (C)	mg/L	7.3	0.50	6171839			
Orthophosphate (P)	mg/L	<0.010	0.010	6163926			
pH	pH	5.87	N/A	6169238			
Total Phosphorus	mg/L	<0.020	0.020	6167194			
Salinity	N/A	<2.0	2.0	6169233			
Reactive Silica (SiO2)	mg/L	1.5	0.50	6169567			
Total Suspended Solids	mg/L	<1.0	1.0	6164551			
Dissolved Sulphate (SO4)	mg/L	3.9	2.0	6169565			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BV Labs Job #: B9F2843
 Report Date: 2019/06/25

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN059			JXN059		
Sampling Date		2019/06/05 10:15			2019/06/05 10:15		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	RDL	QC Batch	SW 13 SURFACE Lab-Dup	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6169817			
Turbidity	NTU	0.81	0.10	6167153			
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6193032	<0.0030	0.0030	6193032
Conductivity	uS/cm	21	1.0	6169239			
RADIONUCLIDE							
Radium-226	Bq/L	<0.010	0.010	6172263	<0.010	0.010	6172263
Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	N/A	6166924			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN060			JXN061		
Sampling Date		2019/06/05 10:15			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE (FILTERED)	RDL	QC Batch	SW 13 DEPTH	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.160	N/A	6161440	0.200	N/A	6161440
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435	<1.0	1.0	6161435
Calculated TDS	mg/L	12	1.0	6161446	14	1.0	6161446
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435	<1.0	1.0	6161435
Cation Sum	me/L	0.170	N/A	6161440	0.180	N/A	6161440
Hardness (CaCO3)	mg/L	2.6	1.0	6161436	2.6	1.0	6161436
Ion Balance (% Difference)	%	3.03	N/A	6161439	5.26	N/A	6161439
Langelier Index (@ 20C)	N/A	NC		6161443	NC		6161443
Langelier Index (@ 4C)	N/A	NC		6161445	NC		6161445
Nitrate (N)	mg/L	<0.050	0.050	6161412	<0.050	0.050	6161412
Saturation pH (@ 20C)	N/A	NC		6161443	NC		6161443
Saturation pH (@ 4C)	N/A	NC		6161445	NC		6161445
Inorganics							
Acidity	mg/L				<5.0	5.0	6174090
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167369	<5.0	5.0	6167369
Total Chemical Oxygen Demand	mg/L				21	20	6163788
Dissolved Chloride (Cl-)	mg/L	3.7	1.0	6169558	3.8	1.0	6169558
Colour	TCU	63	25	6163907	61	25	6163907
Total Dissolved Solids	mg/L				25	10	6170231
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6169240
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169571	<0.050	0.050	6169571
Nitrite (N)	mg/L	<0.010	0.010	6169570	<0.010	0.010	6169570
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167585	<0.050	0.050	6167585
Dissolved Organic Carbon (C)	mg/L	6.7	0.5	6169370			
Total Organic Carbon (C)	mg/L	6.8	0.50	6171834	7.3	0.50	6171839
Orthophosphate (P)	mg/L	<0.010	0.010	6163926	<0.010	0.010	6163926
pH	pH	6.48	N/A	6170015	6.03	N/A	6169238
Total Phosphorus	mg/L				<0.020	0.020	6167194
Salinity	N/A				<2.0	2.0	6169233
Reactive Silica (SiO2)	mg/L	1.6	0.50	6169567	1.6	0.50	6169567
Total Suspended Solids	mg/L				<1.0	1.0	6164551
Dissolved Sulphate (SO4)	mg/L	2.7	2.0	6169565	4.5	2.0	6169565
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



BV Labs Job #: B9F2843
 Report Date: 2019/06/25

McCallum Environmental
 Client Project #: Fifteen Mile Stream
 Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN060			JXN061		
Sampling Date		2019/06/05 10:15			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE (FILTERED)	RDL	QC Batch	SW 13 DEPTH	RDL	QC Batch
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6169817
Turbidity	NTU	0.18	0.10	6167153	0.80	0.10	6167153
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6193032
Conductivity	uS/cm	21	1.0	6170024	21	1.0	6169239
RADIONUCLIDE							
Radium-226	Bq/L				<0.010	0.010	6172263
Subcontracted Analysis							
Subcontract Parameter	N/A				ATTACHED	N/A	6166924
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN062			JXN063		
Sampling Date		2019/06/05 10:45			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 DEPTH (FILTERED)	RDL	QC Batch	FIELD/FILTER BLANK 3	RDL	QC Batch

Calculated Parameters							
Anion Sum	me/L	0.220	N/A	6161440	0.0800	N/A	6161440
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435	<1.0	1.0	6161435
Calculated TDS	mg/L	15	1.0	6161446	4.0	1.0	6161446
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6161435	<1.0	1.0	6161435
Cation Sum	me/L	0.170	N/A	6161440	0.0100	N/A	6161440
Hardness (CaCO3)	mg/L	2.6	1.0	6161436	<1.0	1.0	6161436
Ion Balance (% Difference)	%	12.8	N/A	6161439	77.8	N/A	6161439
Langelier Index (@ 20C)	N/A	NC		6161443	NC		6161443
Langelier Index (@ 4C)	N/A	NC		6161445	NC		6161445
Nitrate (N)	mg/L	<0.050	0.050	6161412	<0.050	0.050	6161412
Saturation pH (@ 20C)	N/A	NC		6161443	NC		6161443
Saturation pH (@ 4C)	N/A	NC		6161445	NC		6161445
Inorganics							
Acidity	mg/L				<5.0	5.0	6174090
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6167369	<5.0	5.0	6167369
Total Chemical Oxygen Demand	mg/L				<20	20	6163795
Dissolved Chloride (Cl-)	mg/L	3.8	1.0	6169558	<1.0	1.0	6169558
Colour	TCU	54	25	6163907	<5.0	5.0	6163907
Total Dissolved Solids	mg/L				<10	10	6170231
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6169240
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6169571	<0.050	0.050	6169571
Nitrite (N)	mg/L	<0.010	0.010	6169570	<0.010	0.010	6169570
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6167585	<0.050	0.050	6167585
Dissolved Organic Carbon (C)	mg/L	6.8	0.5	6169370			
Total Organic Carbon (C)	mg/L	7.3	0.50	6167496	<0.50	0.50	6171834
Orthophosphate (P)	mg/L	<0.010	0.010	6163926	<0.010	0.010	6163926
pH	pH	6.12	N/A	6170015	6.13	N/A	6169238
Total Phosphorus	mg/L				<0.020	0.020	6167194
Salinity	N/A				<2.0	2.0	6169233
Reactive Silica (SiO2)	mg/L	1.7	0.50	6169567	<0.50	0.50	6169567
Total Suspended Solids	mg/L				<1.0	1.0	6164551
Dissolved Sulphate (SO4)	mg/L	5.7	2.0	6169565	4.1	2.0	6169565

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



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN062			JXN063		
Sampling Date		2019/06/05 10:45			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 DEPTH (FILTERED)	RDL	QC Batch	FIELD/FILTER BLANK 3	RDL	QC Batch
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6169817
Turbidity	NTU	0.13	0.10	6167153	0.11	0.10	6167153
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6193032
Conductivity	uS/cm	21	1.0	6170024	<1.0	1.0	6169239
RADIONUCLIDE							
Radium-226	Bq/L				<0.010	0.010	6172263
Subcontracted Analysis							
Subcontract Parameter	N/A				ATTACHED	N/A	6166924
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							



RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN063			JXN064		
Sampling Date		2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3 Lab-Dup	RDL	QC Batch	FIELD/FILTER BLANK 3 FF	RDL	QC Batch

Calculated Parameters							
Anion Sum	me/L				0.0700	N/A	6161440
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6161435
Calculated TDS	mg/L				4.0	1.0	6161446
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6161435
Cation Sum	me/L				0.0100	N/A	6161440
Hardness (CaCO3)	mg/L				<1.0	1.0	6161436
Ion Balance (% Difference)	%				75.0	N/A	6161439
Langelier Index (@ 20C)	N/A				NC		6161443
Langelier Index (@ 4C)	N/A				NC		6161445
Nitrate (N)	mg/L				<0.050	0.050	6161412
Saturation pH (@ 20C)	N/A				NC		6161443
Saturation pH (@ 4C)	N/A				NC		6161445

Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167369
Total Chemical Oxygen Demand	mg/L	<20	20	6163795			
Dissolved Chloride (Cl-)	mg/L				<1.0	1.0	6169558
Colour	TCU				<5.0	5.0	6163907
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6169571
Nitrite (N)	mg/L				<0.010	0.010	6169570
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6167585
Dissolved Organic Carbon (C)	mg/L				<0.5	0.5	6169370
Total Organic Carbon (C)	mg/L				0.60	0.50	6171834
Orthophosphate (P)	mg/L				<0.010	0.010	6163926
pH	pH				6.16	N/A	6170015
Reactive Silica (SiO2)	mg/L				<0.50	0.50	6169567
Dissolved Sulphate (SO4)	mg/L				3.4	2.0	6169565
Turbidity	NTU				<0.10	0.10	6167153
Conductivity	uS/cm				1.7	1.0	6170024

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN064			JXN065			JXN065		
Sampling Date		2019/06/05			2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3 FF Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.00	N/A	6161440			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6161435			
Calculated TDS	mg/L				<1.0	1.0	6161446			
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6161435			
Cation Sum	me/L				0.00	N/A	6161440			
Hardness (CaCO3)	mg/L				<1.0	1.0	6161436			
Langelier Index (@ 20C)	N/A				NC		6161443			
Langelier Index (@ 4C)	N/A				NC		6161445			
Nitrate (N)	mg/L				<0.050	0.050	6161412			
Saturation pH (@ 20C)	N/A				NC		6161443			
Saturation pH (@ 4C)	N/A				NC		6161445			

Inorganics										
Acidity	mg/L				<5.0	5.0	6174090			
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6167369			
Total Chemical Oxygen Demand	mg/L				<20	20	6163795			
Dissolved Chloride (Cl-)	mg/L				<1.0	1.0	6169558			
Colour	TCU				<5.0	5.0	6163907			
Total Dissolved Solids	mg/L				<10	10	6170231			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6170033			
Nitrate + Nitrite (N)	mg/L				<0.050	0.050	6169571			
Nitrite (N)	mg/L				<0.010	0.010	6169570			
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6167585			
Dissolved Organic Carbon (C)	mg/L				<0.5	0.5	6169370	<0.5	0.5	6169370
Total Organic Carbon (C)	mg/L				<0.50	0.50	6167496			
Orthophosphate (P)	mg/L				<0.010	0.010	6163926			
pH	pH				6.51	N/A	6170015			
Total Phosphorus	mg/L				<0.020	0.020	6167194	<0.020	0.020	6167194
Salinity	N/A				<2.0	2.0	6169233			
Reactive Silica (SiO2)	mg/L				<0.50	0.50	6169567			
Total Suspended Solids	mg/L				<1.0	1.0	6164551			
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6169565			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

RESULTS OF ANALYSES OF WATER

BV Labs ID		JXN064			JXN065			JXN065		
Sampling Date		2019/06/05			2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3 FF Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Turbidity	NTU	0.10	0.10	6167153	0.19	0.10	6167153			
Conductivity	uS/cm				<1.0	1.0	6170024			

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch
 Lab-Dup = Laboratory Initiated Duplicate



MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JXN059	JXN059			JXN060		
Sampling Date		2019/06/05 10:15	2019/06/05 10:15			2019/06/05 10:15		
COC Number		719798-04-01	719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	SW 13 SURFACE Lab-Dup	RDL	QC Batch	SW 13 SURFACE (FILTERED)	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L					<0.013	0.013	6161204
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6167149			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								

BV Labs ID		JXN061			JXN062		
Sampling Date		2019/06/05 10:45			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 DEPTH	RDL	QC Batch	SW 13 DEPTH (FILTERED)	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L					<0.013	0.013	6161204
Total Mercury (Hg)	ug/L	<0.013	0.013	6167149				
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

BV Labs ID		JXN063			JXN064		
Sampling Date		2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3	RDL	QC Batch	FIELD/FILTER BLANK 3 FF	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L					<0.013	0.013	6161204
Total Mercury (Hg)	ug/L	<0.013	0.013	6167149				
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		JXN065		
Sampling Date		2019/06/05		
COC Number		719798-04-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Metals				
Total Mercury (Hg)	ug/L	<0.013	0.013	6167149
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN059			JXN060			JXN061		
Sampling Date		2019/06/05 10:15			2019/06/05 10:15			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	RDL	QC Batch	SW 13 SURFACE (FILTERED)	RDL	QC Batch	SW 13 DEPTH	RDL	QC Batch
Metals										
Dissolved Aluminum (Al)	ug/L				170	5.0	6163961			
Total Aluminum (Al)	ug/L	180	5.0	6163752				190	5.0	6163752
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6163961			
Total Antimony (Sb)	ug/L	<1.0	1.0	6163752				<1.0	1.0	6163752
Dissolved Arsenic (As)	ug/L				1.9	1.0	6163961			
Total Arsenic (As)	ug/L	1.8	1.0	6163752				1.7	1.0	6163752
Dissolved Barium (Ba)	ug/L				3.9	1.0	6163961			
Total Barium (Ba)	ug/L	4.0	1.0	6163752				3.8	1.0	6163752
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6163961			
Total Beryllium (Be)	ug/L	<1.0	1.0	6163752				<1.0	1.0	6163752
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6163961			
Total Bismuth (Bi)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Boron (B)	ug/L				<50	50	6163961			
Total Boron (B)	ug/L	<50	50	6163752				<50	50	6163752
Dissolved Cadmium (Cd)	ug/L				0.015	0.010	6163961			
Total Cadmium (Cd)	ug/L	0.018	0.010	6163752				0.016	0.010	6163752
Dissolved Calcium (Ca)	ug/L				560	100	6163961			
Total Calcium (Ca)	ug/L	550	100	6163752				580	100	6163752
Dissolved Chromium (Cr)	ug/L				1.0	1.0	6163961			
Total Chromium (Cr)	ug/L	1.0	1.0	6163752				1.2	1.0	6163752
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6163961			
Total Cobalt (Co)	ug/L	<0.40	0.40	6163752				<0.40	0.40	6163752
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6163961			
Total Copper (Cu)	ug/L	<0.50	0.50	6163752				<0.50	0.50	6163752
Dissolved Iron (Fe)	ug/L				120	50	6163961			
Total Iron (Fe)	ug/L	160	50	6163752				190	50	6163752
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6163961			
Total Lead (Pb)	ug/L	<0.50	0.50	6163752				<0.50	0.50	6163752
Dissolved Magnesium (Mg)	ug/L				280	100	6163961			
Total Magnesium (Mg)	ug/L	280	100	6163752				280	100	6163752
Dissolved Manganese (Mn)	ug/L				50	2.0	6163961			
Total Manganese (Mn)	ug/L	48	2.0	6163752				49	2.0	6163752
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6163961			
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN059			JXN060			JXN061		
Sampling Date		2019/06/05 10:15			2019/06/05 10:15			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	RDL	QC Batch	SW 13 SURFACE (FILTERED)	RDL	QC Batch	SW 13 DEPTH	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6163961			
Total Nickel (Ni)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Phosphorus (P)	ug/L				<100	100	6163961			
Total Phosphorus (P)	ug/L	<100	100	6163752				<100	100	6163752
Dissolved Potassium (K)	ug/L				280	100	6163961			
Total Potassium (K)	ug/L	290	100	6163752				300	100	6163752
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6163961			
Total Selenium (Se)	ug/L	<1.0	1.0	6163752				<1.0	1.0	6163752
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6163961			
Total Silver (Ag)	ug/L	<0.10	0.10	6163752				<0.10	0.10	6163752
Dissolved Sodium (Na)	ug/L				2500	100	6163961			
Total Sodium (Na)	ug/L	2500	100	6163752				2500	100	6163752
Dissolved Strontium (Sr)	ug/L				4.7	2.0	6163961			
Total Strontium (Sr)	ug/L	4.7	2.0	6163752				5.0	2.0	6163752
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6163961			
Total Thallium (Tl)	ug/L	<0.10	0.10	6163752				<0.10	0.10	6163752
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6163961			
Total Tin (Sn)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6163961			
Total Titanium (Ti)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Uranium (U)	ug/L				<0.10	0.10	6163961			
Total Uranium (U)	ug/L	<0.10	0.10	6163752				<0.10	0.10	6163752
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6163961			
Total Vanadium (V)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L	<2.0	2.0	6163752				<2.0	2.0	6163752
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6163961			
Total Zinc (Zn)	ug/L	<5.0	5.0	6163752				6.6	5.0	6163752

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN062			JXN063		
Sampling Date		2019/06/05 10:45			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 DEPTH (FILTERED)	RDL	QC Batch	FIELD/FILTER BLANK 3	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	180	5.0	6163961			
Total Aluminum (Al)	ug/L				<5.0	5.0	6163752
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6163961			
Total Antimony (Sb)	ug/L				<1.0	1.0	6163752
Dissolved Arsenic (As)	ug/L	1.6	1.0	6163961			
Total Arsenic (As)	ug/L				<1.0	1.0	6163752
Dissolved Barium (Ba)	ug/L	3.8	1.0	6163961			
Total Barium (Ba)	ug/L				<1.0	1.0	6163752
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6163961			
Total Beryllium (Be)	ug/L				<1.0	1.0	6163752
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6163961			
Total Bismuth (Bi)	ug/L				<2.0	2.0	6163752
Dissolved Boron (B)	ug/L	<50	50	6163961			
Total Boron (B)	ug/L				<50	50	6163752
Dissolved Cadmium (Cd)	ug/L	0.018	0.010	6163961			
Total Cadmium (Cd)	ug/L				<0.010	0.010	6163752
Dissolved Calcium (Ca)	ug/L	570	100	6163961			
Total Calcium (Ca)	ug/L				<100	100	6163752
Dissolved Chromium (Cr)	ug/L	<1.0	1.0	6163961			
Total Chromium (Cr)	ug/L				1.1	1.0	6163752
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6163961			
Total Cobalt (Co)	ug/L				<0.40	0.40	6163752
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6163961			
Total Copper (Cu)	ug/L				0.56	0.50	6163752
Dissolved Iron (Fe)	ug/L	130	50	6163961			
Total Iron (Fe)	ug/L				<50	50	6163752
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6163961			
Total Lead (Pb)	ug/L				<0.50	0.50	6163752
Dissolved Magnesium (Mg)	ug/L	290	100	6163961			
Total Magnesium (Mg)	ug/L				<100	100	6163752
Dissolved Manganese (Mn)	ug/L	49	2.0	6163961			
Total Manganese (Mn)	ug/L				<2.0	2.0	6163752
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6163961			
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6163752
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN062			JXN063		
Sampling Date		2019/06/05 10:45			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	SW 13 DEPTH (FILTERED)	RDL	QC Batch	FIELD/FILTER BLANK 3	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6163961			
Total Nickel (Ni)	ug/L				<2.0	2.0	6163752
Dissolved Phosphorus (P)	ug/L	<100	100	6163961			
Total Phosphorus (P)	ug/L				<100	100	6163752
Dissolved Potassium (K)	ug/L	290	100	6163961			
Total Potassium (K)	ug/L				<100	100	6163752
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6163961			
Total Selenium (Se)	ug/L				<1.0	1.0	6163752
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6163961			
Total Silver (Ag)	ug/L				<0.10	0.10	6163752
Dissolved Sodium (Na)	ug/L	2500	100	6163961			
Total Sodium (Na)	ug/L				130	100	6163752
Dissolved Strontium (Sr)	ug/L	5.1	2.0	6163961			
Total Strontium (Sr)	ug/L				<2.0	2.0	6163752
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6163961			
Total Thallium (Tl)	ug/L				<0.10	0.10	6163752
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6163961			
Total Tin (Sn)	ug/L				<2.0	2.0	6163752
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6163961			
Total Titanium (Ti)	ug/L				<2.0	2.0	6163752
Dissolved Uranium (U)	ug/L	<0.10	0.10	6163961			
Total Uranium (U)	ug/L				<0.10	0.10	6163752
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6163961			
Total Vanadium (V)	ug/L				<2.0	2.0	6163752
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L				<2.0	2.0	6163752
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6163961			
Total Zinc (Zn)	ug/L				<5.0	5.0	6163752

RDL = Reportable Detection Limit
 QC Batch = Quality Control Batch



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN064			JXN065		
Sampling Date		2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	6163961	<5.0	5.0	6167410
Total Aluminum (Al)	ug/L				<5.0	5.0	6163752
Dissolved Antimony (Sb)	ug/L	<1.0	1.0	6163961	<1.0	1.0	6167410
Total Antimony (Sb)	ug/L				<1.0	1.0	6163752
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6163961	<1.0	1.0	6167410
Total Arsenic (As)	ug/L				<1.0	1.0	6163752
Dissolved Barium (Ba)	ug/L	<1.0	1.0	6163961	<1.0	1.0	6167410
Total Barium (Ba)	ug/L				<1.0	1.0	6163752
Dissolved Beryllium (Be)	ug/L	<1.0	1.0	6163961	<1.0	1.0	6167410
Total Beryllium (Be)	ug/L				<1.0	1.0	6163752
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Bismuth (Bi)	ug/L				<2.0	2.0	6163752
Dissolved Boron (B)	ug/L	<50	50	6163961	<50	50	6167410
Total Boron (B)	ug/L				<50	50	6163752
Dissolved Cadmium (Cd)	ug/L	<0.010	0.010	6163961	0.010	0.010	6167410
Total Cadmium (Cd)	ug/L				<0.010	0.010	6163752
Dissolved Calcium (Ca)	ug/L	<100	100	6163961	<100	100	6167410
Total Calcium (Ca)	ug/L				<100	100	6163752
Dissolved Chromium (Cr)	ug/L	1.1	1.0	6163961	<1.0	1.0	6167410
Total Chromium (Cr)	ug/L				<1.0	1.0	6163752
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	6163961	<0.40	0.40	6167410
Total Cobalt (Co)	ug/L				<0.40	0.40	6163752
Dissolved Copper (Cu)	ug/L	<0.50	0.50	6163961	<0.50	0.50	6167410
Total Copper (Cu)	ug/L				<0.50	0.50	6163752
Dissolved Iron (Fe)	ug/L	<50	50	6163961	<50	50	6167410
Total Iron (Fe)	ug/L				<50	50	6163752
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6163961	<0.50	0.50	6167410
Total Lead (Pb)	ug/L				<0.50	0.50	6163752
Dissolved Magnesium (Mg)	ug/L	<100	100	6163961	<100	100	6167410
Total Magnesium (Mg)	ug/L				<100	100	6163752
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Manganese (Mn)	ug/L				<2.0	2.0	6163752
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Molybdenum (Mo)	ug/L				<2.0	2.0	6163752
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



ELEMENTS BY ICP/MS (WATER)

BV Labs ID		JXN064			JXN065		
Sampling Date		2019/06/05			2019/06/05		
COC Number		719798-04-01			719798-04-01		
	UNITS	FIELD/FILTER BLANK 3 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Nickel (Ni)	ug/L				<2.0	2.0	6163752
Dissolved Phosphorus (P)	ug/L	<100	100	6163961	<100	100	6167410
Total Phosphorus (P)	ug/L				<100	100	6163752
Dissolved Potassium (K)	ug/L	<100	100	6163961	<100	100	6167410
Total Potassium (K)	ug/L				<100	100	6163752
Dissolved Selenium (Se)	ug/L	<1.0	1.0	6163961	<1.0	1.0	6167410
Total Selenium (Se)	ug/L				<1.0	1.0	6163752
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6163961	<0.10	0.10	6167410
Total Silver (Ag)	ug/L				<0.10	0.10	6163752
Dissolved Sodium (Na)	ug/L	120	100	6163961	<100	100	6167410
Total Sodium (Na)	ug/L				<100	100	6163752
Dissolved Strontium (Sr)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Strontium (Sr)	ug/L				<2.0	2.0	6163752
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	6163961	<0.10	0.10	6167410
Total Thallium (Tl)	ug/L				<0.10	0.10	6163752
Dissolved Tin (Sn)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Tin (Sn)	ug/L				<2.0	2.0	6163752
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Titanium (Ti)	ug/L				<2.0	2.0	6163752
Dissolved Uranium (U)	ug/L	<0.10	0.10	6163961	<0.10	0.10	6167410
Total Uranium (U)	ug/L				<0.10	0.10	6163752
Dissolved Vanadium (V)	ug/L	<2.0	2.0	6163961	<2.0	2.0	6167410
Total Vanadium (V)	ug/L				<2.0	2.0	6163752
Dissolved Zirconium (Zr)	ug/L	<2.0	2.0	6163961			
Total Zirconium (Zr)	ug/L				<2.0	2.0	6163752
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6163961	<5.0	5.0	6167410
Total Zinc (Zn)	ug/L				<5.0	5.0	6163752
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		JXN059			JXN060			JXN061		
Sampling Date		2019/06/05 10:15			2019/06/05 10:15			2019/06/05 10:45		
COC Number		719798-04-01			719798-04-01			719798-04-01		
	UNITS	SW 13 SURFACE	RDL	QC Batch	SW 13 SURFACE (FILTERED)	RDL	QC Batch	SW 13 DEPTH	RDL	QC Batch
Metals										
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6166270			
Total Tungsten (W)	ug/L	<1.0	1.0	6174133				<1.0	1.0	6174133
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXN062			JXN063					
Sampling Date		2019/06/05 10:45			2019/06/05					
COC Number		719798-04-01			719798-04-01					
	UNITS	SW 13 DEPTH (FILTERED)	RDL	QC Batch	FIELD/FILTER BLANK 3	RDL	QC Batch			
Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6166270						
Total Tungsten (W)	ug/L				<1.0	1.0	6174133			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

BV Labs ID		JXN064								
Sampling Date		2019/06/05								
COC Number		719798-04-01								
	UNITS	FIELD/FILTER BLANK 3 FF	RDL	QC Batch						
Metals										
Dissolved Tungsten (W)	ug/L	<1.0	1.0	6166270						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.3°C
Package 2	3.3°C

Sample JXN061 [SW 13 DEPTH] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXN062 [SW 13 DEPTH (FILTERED)] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXN063 [FIELD/FILTER BLANK 3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JXN064 [FIELD/FILTER BLANK 3 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6161204	CCR	Matrix Spike	Dissolved Mercury (Hg)	2019/06/07		100	%	80 - 120
	6161204	CCR	Spiked Blank	Dissolved Mercury (Hg)	2019/06/07		102	%	80 - 120
	6161204	CCR	Method Blank	Dissolved Mercury (Hg)	2019/06/07	<0.013		ug/L	
	6161204	CCR	RPD	Dissolved Mercury (Hg)	2019/06/07	NC		%	20
	6163752	BAN	Matrix Spike	Total Aluminum (Al)	2019/06/08		104	%	80 - 120
				Total Antimony (Sb)	2019/06/08		106	%	80 - 120
				Total Arsenic (As)	2019/06/08		103	%	80 - 120
				Total Barium (Ba)	2019/06/08		103	%	80 - 120
				Total Beryllium (Be)	2019/06/08		107	%	80 - 120
				Total Bismuth (Bi)	2019/06/08		105	%	80 - 120
				Total Boron (B)	2019/06/08		110	%	80 - 120
				Total Cadmium (Cd)	2019/06/08		100	%	80 - 120
				Total Calcium (Ca)	2019/06/08		108	%	80 - 120
				Total Chromium (Cr)	2019/06/08		103	%	80 - 120
				Total Cobalt (Co)	2019/06/08		105	%	80 - 120
				Total Copper (Cu)	2019/06/08		102	%	80 - 120
				Total Iron (Fe)	2019/06/08		111	%	80 - 120
				Total Lead (Pb)	2019/06/08		105	%	80 - 120
				Total Magnesium (Mg)	2019/06/08		109	%	80 - 120
				Total Manganese (Mn)	2019/06/08		104	%	80 - 120
				Total Molybdenum (Mo)	2019/06/08		110	%	80 - 120
				Total Nickel (Ni)	2019/06/08		103	%	80 - 120
				Total Phosphorus (P)	2019/06/08		108	%	80 - 120
				Total Potassium (K)	2019/06/08		108	%	80 - 120
				Total Selenium (Se)	2019/06/08		100	%	80 - 120
				Total Silver (Ag)	2019/06/08		103	%	80 - 120
				Total Sodium (Na)	2019/06/08		103	%	80 - 120
				Total Strontium (Sr)	2019/06/08		108	%	80 - 120
				Total Thallium (Tl)	2019/06/08		108	%	80 - 120
				Total Tin (Sn)	2019/06/08		105	%	80 - 120
				Total Titanium (Ti)	2019/06/08		104	%	80 - 120
				Total Uranium (U)	2019/06/08		111	%	80 - 120
				Total Vanadium (V)	2019/06/08		103	%	80 - 120
				Total Zirconium (Zr)	2019/06/08		108	%	80 - 120
				Total Zinc (Zn)	2019/06/08		103	%	80 - 120
	6163752	BAN	Spiked Blank	Total Aluminum (Al)	2019/06/08		103	%	80 - 120
				Total Antimony (Sb)	2019/06/08		105	%	80 - 120
				Total Arsenic (As)	2019/06/08		98	%	80 - 120
				Total Barium (Ba)	2019/06/08		99	%	80 - 120
				Total Beryllium (Be)	2019/06/08		102	%	80 - 120
				Total Bismuth (Bi)	2019/06/08		102	%	80 - 120
				Total Boron (B)	2019/06/08		105	%	80 - 120
				Total Cadmium (Cd)	2019/06/08		97	%	80 - 120
				Total Calcium (Ca)	2019/06/08		105	%	80 - 120
				Total Chromium (Cr)	2019/06/08		98	%	80 - 120
				Total Cobalt (Co)	2019/06/08		101	%	80 - 120
				Total Copper (Cu)	2019/06/08		99	%	80 - 120
				Total Iron (Fe)	2019/06/08		103	%	80 - 120
				Total Lead (Pb)	2019/06/08		102	%	80 - 120
				Total Magnesium (Mg)	2019/06/08		107	%	80 - 120
				Total Manganese (Mn)	2019/06/08		101	%	80 - 120
				Total Molybdenum (Mo)	2019/06/08		106	%	80 - 120
				Total Nickel (Ni)	2019/06/08		100	%	80 - 120
				Total Phosphorus (P)	2019/06/08		105	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Potassium (K)	2019/06/08		106	%	80 - 120
			Total Selenium (Se)	2019/06/08		98	%	80 - 120
			Total Silver (Ag)	2019/06/08		99	%	80 - 120
			Total Sodium (Na)	2019/06/08		100	%	80 - 120
			Total Strontium (Sr)	2019/06/08		101	%	80 - 120
			Total Thallium (Tl)	2019/06/08		104	%	80 - 120
			Total Tin (Sn)	2019/06/08		103	%	80 - 120
			Total Titanium (Ti)	2019/06/08		103	%	80 - 120
			Total Uranium (U)	2019/06/08		108	%	80 - 120
			Total Vanadium (V)	2019/06/08		100	%	80 - 120
			Total Zirconium (Zr)	2019/06/08		103	%	80 - 120
			Total Zinc (Zn)	2019/06/08		99	%	80 - 120
6163752	BAN	Method Blank	Total Aluminum (Al)	2019/06/08	<5.0		ug/L	
			Total Antimony (Sb)	2019/06/08	<1.0		ug/L	
			Total Arsenic (As)	2019/06/08	<1.0		ug/L	
			Total Barium (Ba)	2019/06/08	<1.0		ug/L	
			Total Beryllium (Be)	2019/06/08	<1.0		ug/L	
			Total Bismuth (Bi)	2019/06/08	<2.0		ug/L	
			Total Boron (B)	2019/06/08	<50		ug/L	
			Total Cadmium (Cd)	2019/06/08	<0.010		ug/L	
			Total Calcium (Ca)	2019/06/08	<100		ug/L	
			Total Chromium (Cr)	2019/06/08	<1.0		ug/L	
			Total Cobalt (Co)	2019/06/08	<0.40		ug/L	
			Total Copper (Cu)	2019/06/08	<0.50		ug/L	
			Total Iron (Fe)	2019/06/08	<50		ug/L	
			Total Lead (Pb)	2019/06/08	<0.50		ug/L	
			Total Magnesium (Mg)	2019/06/08	<100		ug/L	
			Total Manganese (Mn)	2019/06/08	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/06/08	<2.0		ug/L	
			Total Nickel (Ni)	2019/06/08	<2.0		ug/L	
			Total Phosphorus (P)	2019/06/08	<100		ug/L	
			Total Potassium (K)	2019/06/08	<100		ug/L	
			Total Selenium (Se)	2019/06/08	<1.0		ug/L	
			Total Silver (Ag)	2019/06/08	<0.10		ug/L	
			Total Sodium (Na)	2019/06/08	<100		ug/L	
			Total Strontium (Sr)	2019/06/08	<2.0		ug/L	
			Total Thallium (Tl)	2019/06/08	<0.10		ug/L	
			Total Tin (Sn)	2019/06/08	<2.0		ug/L	
			Total Titanium (Ti)	2019/06/08	<2.0		ug/L	
			Total Uranium (U)	2019/06/08	<0.10		ug/L	
			Total Vanadium (V)	2019/06/08	<2.0		ug/L	
			Total Zirconium (Zr)	2019/06/08	<2.0		ug/L	
			Total Zinc (Zn)	2019/06/08	<5.0		ug/L	
6163752	BAN	RPD	Total Aluminum (Al)	2019/06/08	1.8		%	20
6163788	ZZH	Matrix Spike [JXN059-09]	Total Chemical Oxygen Demand	2019/06/07		105	%	80 - 120
6163788	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/06/07		99	%	80 - 120
6163788	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/06/07		103	%	80 - 120
6163788	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/06/07	<20		mg/L	
6163788	ZZH	RPD [JXN059-09]	Total Chemical Oxygen Demand	2019/06/07	16		%	25
6163795	ZZH	Matrix Spike [JXN063-09]	Total Chemical Oxygen Demand	2019/06/07		102	%	80 - 120
6163795	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/06/07		97	%	80 - 120
6163795	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/06/07		101	%	80 - 120
6163795	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/06/07	<20		mg/L	
6163795	ZZH	RPD [JXN063-09]	Total Chemical Oxygen Demand	2019/06/07	NC		%	25



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6163907	SRM	Spiked Blank	Colour	2019/06/07		96	%	80 - 120
	6163907	SRM	Method Blank	Colour	2019/06/07	<5.0		TCU	
	6163907	SRM	RPD	Colour	2019/06/07	NC		%	20
	6163926	SRM	Matrix Spike	Orthophosphate (P)	2019/06/07		93	%	80 - 120
	6163926	SRM	Spiked Blank	Orthophosphate (P)	2019/06/07		92	%	80 - 120
	6163926	SRM	Method Blank	Orthophosphate (P)	2019/06/07	<0.010		mg/L	
	6163926	SRM	RPD	Orthophosphate (P)	2019/06/07	NC		%	25
	6163961	BAN	Matrix Spike	Dissolved Aluminum (Al)	2019/06/07		99	%	80 - 120
				Dissolved Antimony (Sb)	2019/06/07		92	%	80 - 120
				Dissolved Arsenic (As)	2019/06/07		96	%	80 - 120
				Dissolved Barium (Ba)	2019/06/07		98	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/07		100	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/07		94	%	80 - 120
				Dissolved Boron (B)	2019/06/07		98	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/07		97	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/07		98	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/07		97	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/07		99	%	80 - 120
				Dissolved Copper (Cu)	2019/06/07		97	%	80 - 120
				Dissolved Iron (Fe)	2019/06/07		98	%	80 - 120
				Dissolved Lead (Pb)	2019/06/07		99	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/07		104	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/07		97	%	80 - 120
				Dissolved Molybdenum (Mo)	2019/06/07		97	%	80 - 120
				Dissolved Nickel (Ni)	2019/06/07		98	%	80 - 120
				Dissolved Phosphorus (P)	2019/06/07		103	%	80 - 120
				Dissolved Potassium (K)	2019/06/07		101	%	80 - 120
				Dissolved Selenium (Se)	2019/06/07		97	%	80 - 120
				Dissolved Silver (Ag)	2019/06/07		97	%	80 - 120
				Dissolved Sodium (Na)	2019/06/07		96	%	80 - 120
				Dissolved Strontium (Sr)	2019/06/07		98	%	80 - 120
				Dissolved Thallium (Tl)	2019/06/07		100	%	80 - 120
				Dissolved Tin (Sn)	2019/06/07		99	%	80 - 120
				Dissolved Titanium (Ti)	2019/06/07		104	%	80 - 120
				Dissolved Uranium (U)	2019/06/07		104	%	80 - 120
				Dissolved Vanadium (V)	2019/06/07		97	%	80 - 120
				Dissolved Zirconium (Zr)	2019/06/07		102	%	80 - 120
				Dissolved Zinc (Zn)	2019/06/07		99	%	80 - 120
	6163961	BAN	Spiked Blank	Dissolved Aluminum (Al)	2019/06/07		99	%	80 - 120
				Dissolved Antimony (Sb)	2019/06/07		91	%	80 - 120
				Dissolved Arsenic (As)	2019/06/07		98	%	80 - 120
				Dissolved Barium (Ba)	2019/06/07		98	%	80 - 120
				Dissolved Beryllium (Be)	2019/06/07		100	%	80 - 120
				Dissolved Bismuth (Bi)	2019/06/07		95	%	80 - 120
				Dissolved Boron (B)	2019/06/07		101	%	80 - 120
				Dissolved Cadmium (Cd)	2019/06/07		98	%	80 - 120
				Dissolved Calcium (Ca)	2019/06/07		99	%	80 - 120
				Dissolved Chromium (Cr)	2019/06/07		97	%	80 - 120
				Dissolved Cobalt (Co)	2019/06/07		99	%	80 - 120
				Dissolved Copper (Cu)	2019/06/07		99	%	80 - 120
				Dissolved Iron (Fe)	2019/06/07		101	%	80 - 120
				Dissolved Lead (Pb)	2019/06/07		100	%	80 - 120
				Dissolved Magnesium (Mg)	2019/06/07		105	%	80 - 120
				Dissolved Manganese (Mn)	2019/06/07		101	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Molybdenum (Mo)	2019/06/07		99	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/07		99	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/07		103	%	80 - 120
			Dissolved Potassium (K)	2019/06/07		104	%	80 - 120
			Dissolved Selenium (Se)	2019/06/07		97	%	80 - 120
			Dissolved Silver (Ag)	2019/06/07		96	%	80 - 120
			Dissolved Sodium (Na)	2019/06/07		98	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/07		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/07		100	%	80 - 120
			Dissolved Tin (Sn)	2019/06/07		97	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/07		101	%	80 - 120
			Dissolved Uranium (U)	2019/06/07		105	%	80 - 120
			Dissolved Vanadium (V)	2019/06/07		98	%	80 - 120
			Dissolved Zirconium (Zr)	2019/06/07		102	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/07		100	%	80 - 120
6163961	BAN	Method Blank	Dissolved Aluminum (Al)	2019/06/07	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/06/07	<1.0		ug/L	
			Dissolved Arsenic (As)	2019/06/07	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/06/07	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/06/07	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/06/07	<2.0		ug/L	
			Dissolved Boron (B)	2019/06/07	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/06/07	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/06/07	<100		ug/L	
			Dissolved Chromium (Cr)	2019/06/07	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/06/07	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/06/07	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/06/07	<50		ug/L	
			Dissolved Lead (Pb)	2019/06/07	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/06/07	<100		ug/L	
			Dissolved Manganese (Mn)	2019/06/07	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/06/07	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/06/07	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/06/07	<100		ug/L	
			Dissolved Potassium (K)	2019/06/07	<100		ug/L	
			Dissolved Selenium (Se)	2019/06/07	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/06/07	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/06/07	<100		ug/L	
			Dissolved Strontium (Sr)	2019/06/07	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/06/07	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/06/07	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/06/07	<2.0		ug/L	
			Dissolved Uranium (U)	2019/06/07	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/06/07	<2.0		ug/L	
			Dissolved Zirconium (Zr)	2019/06/07	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/06/07	<5.0		ug/L	
6163961	BAN	RPD	Dissolved Aluminum (Al)	2019/06/07	1.4		%	20
			Dissolved Antimony (Sb)	2019/06/07	NC		%	20
			Dissolved Arsenic (As)	2019/06/07	0.36		%	20
			Dissolved Barium (Ba)	2019/06/07	2.1		%	20
			Dissolved Beryllium (Be)	2019/06/07	NC		%	20
			Dissolved Bismuth (Bi)	2019/06/07	NC		%	20
			Dissolved Boron (B)	2019/06/07	NC		%	20
			Dissolved Cadmium (Cd)	2019/06/07	18		%	20



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Calcium (Ca)	2019/06/07	1.7		%	20
			Dissolved Chromium (Cr)	2019/06/07	NC		%	20
			Dissolved Cobalt (Co)	2019/06/07	NC		%	20
			Dissolved Copper (Cu)	2019/06/07	0.49		%	20
			Dissolved Iron (Fe)	2019/06/07	0.45		%	20
			Dissolved Lead (Pb)	2019/06/07	NC		%	20
			Dissolved Magnesium (Mg)	2019/06/07	0.81		%	20
			Dissolved Manganese (Mn)	2019/06/07	2.6		%	20
			Dissolved Molybdenum (Mo)	2019/06/07	NC		%	20
			Dissolved Nickel (Ni)	2019/06/07	NC		%	20
			Dissolved Phosphorus (P)	2019/06/07	NC		%	20
			Dissolved Potassium (K)	2019/06/07	6.0		%	20
			Dissolved Selenium (Se)	2019/06/07	NC		%	20
			Dissolved Silver (Ag)	2019/06/07	NC		%	20
			Dissolved Sodium (Na)	2019/06/07	1.8		%	20
			Dissolved Strontium (Sr)	2019/06/07	1.7		%	20
			Dissolved Thallium (Tl)	2019/06/07	NC		%	20
			Dissolved Tin (Sn)	2019/06/07	NC		%	20
			Dissolved Titanium (Ti)	2019/06/07	NC		%	20
			Dissolved Uranium (U)	2019/06/07	NC		%	20
			Dissolved Vanadium (V)	2019/06/07	NC		%	20
			Dissolved Zirconium (Zr)	2019/06/07	NC		%	20
			Dissolved Zinc (Zn)	2019/06/07	NC		%	20
6164551	ZZH	QC Standard	Total Suspended Solids	2019/06/10		95	%	80 - 120
6164551	ZZH	Method Blank	Total Suspended Solids	2019/06/10	<1.0		mg/L	
6164551	ZZH	RPD	Total Suspended Solids	2019/06/10	0		%	20
6166270	TNG	Matrix Spike	Dissolved Tungsten (W)	2019/06/11		103	%	80 - 120
6166270	TNG	Spiked Blank	Dissolved Tungsten (W)	2019/06/11		99	%	80 - 120
6166270	TNG	Method Blank	Dissolved Tungsten (W)	2019/06/11	<1.0		ug/L	
6166270	TNG	RPD	Dissolved Tungsten (W)	2019/06/11	NC		%	20
6167149	CCR	Matrix Spike [JXN061-10]	Total Mercury (Hg)	2019/06/10		102	%	80 - 120
6167149	CCR	Spiked Blank	Total Mercury (Hg)	2019/06/10		103	%	80 - 120
6167149	CCR	Method Blank	Total Mercury (Hg)	2019/06/10	<0.013		ug/L	
6167149	CCR	RPD [JXN059-10]	Total Mercury (Hg)	2019/06/10	NC		%	20
6167153	EMT	QC Standard	Turbidity	2019/06/10		114	%	80 - 120
6167153	EMT	Spiked Blank	Turbidity	2019/06/10		98	%	80 - 120
6167153	EMT	Method Blank	Turbidity	2019/06/10	<0.10		NTU	
6167153	EMT	RPD [JXN064-01]	Turbidity	2019/06/10	0		%	20
6167194	MCN	Matrix Spike [JXN065-07]	Total Phosphorus	2019/06/11		107	%	80 - 120
6167194	MCN	Spiked Blank	Total Phosphorus	2019/06/11		101	%	80 - 120
6167194	MCN	Method Blank	Total Phosphorus	2019/06/11	<0.020		mg/L	
6167194	MCN	RPD [JXN065-07]	Total Phosphorus	2019/06/11	NC		%	25
6167369	SRM	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/06/10		95	%	80 - 120
6167369	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/06/10		94	%	80 - 120
6167369	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/06/10	<5.0		mg/L	
6167369	SRM	RPD	Total Alkalinity (Total as CaCO3)	2019/06/10	NC		%	25
6167410	MLB	Matrix Spike	Dissolved Aluminum (Al)	2019/06/11		101	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/11		97	%	80 - 120
			Dissolved Arsenic (As)	2019/06/11		97	%	80 - 120
			Dissolved Barium (Ba)	2019/06/11		100	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
			Dissolved Boron (B)	2019/06/11		104	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/11		98	%	80 - 120



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McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Calcium (Ca)	2019/06/11		100	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/11		97	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/11		98	%	80 - 120
			Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
			Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
			Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/11		106	%	80 - 120
			Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/11		98	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/11		98	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/11		104	%	80 - 120
			Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
			Dissolved Selenium (Se)	2019/06/11		96	%	80 - 120
			Dissolved Silver (Ag)	2019/06/11		96	%	80 - 120
			Dissolved Sodium (Na)	2019/06/11		101	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/11		101	%	80 - 120
			Dissolved Tin (Sn)	2019/06/11		98	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/11		100	%	80 - 120
			Dissolved Uranium (U)	2019/06/11		103	%	80 - 120
			Dissolved Vanadium (V)	2019/06/11		101	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/11		99	%	80 - 120
6167410	MLB	Spiked Blank	Dissolved Aluminum (Al)	2019/06/11		102	%	80 - 120
			Dissolved Antimony (Sb)	2019/06/11		96	%	80 - 120
			Dissolved Arsenic (As)	2019/06/11		96	%	80 - 120
			Dissolved Barium (Ba)	2019/06/11		99	%	80 - 120
			Dissolved Beryllium (Be)	2019/06/11		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/06/11		98	%	80 - 120
			Dissolved Boron (B)	2019/06/11		107	%	80 - 120
			Dissolved Cadmium (Cd)	2019/06/11		97	%	80 - 120
			Dissolved Calcium (Ca)	2019/06/11		99	%	80 - 120
			Dissolved Chromium (Cr)	2019/06/11		95	%	80 - 120
			Dissolved Cobalt (Co)	2019/06/11		96	%	80 - 120
			Dissolved Copper (Cu)	2019/06/11		96	%	80 - 120
			Dissolved Iron (Fe)	2019/06/11		101	%	80 - 120
			Dissolved Lead (Pb)	2019/06/11		100	%	80 - 120
			Dissolved Magnesium (Mg)	2019/06/11		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/06/11		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/06/11		102	%	80 - 120
			Dissolved Nickel (Ni)	2019/06/11		96	%	80 - 120
			Dissolved Phosphorus (P)	2019/06/11		103	%	80 - 120
			Dissolved Potassium (K)	2019/06/11		99	%	80 - 120
			Dissolved Selenium (Se)	2019/06/11		97	%	80 - 120
			Dissolved Silver (Ag)	2019/06/11		97	%	80 - 120
			Dissolved Sodium (Na)	2019/06/11		97	%	80 - 120
			Dissolved Strontium (Sr)	2019/06/11		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/06/11		102	%	80 - 120
			Dissolved Tin (Sn)	2019/06/11		99	%	80 - 120
			Dissolved Titanium (Ti)	2019/06/11		102	%	80 - 120
			Dissolved Uranium (U)	2019/06/11		103	%	80 - 120
			Dissolved Vanadium (V)	2019/06/11		100	%	80 - 120
			Dissolved Zinc (Zn)	2019/06/11		98	%	80 - 120
6167410	MLB	Method Blank	Dissolved Aluminum (Al)	2019/06/11	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/06/11	<1.0		ug/L	



BUREAU
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BV Labs Job #: B9F2843
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McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Arsenic (As)	2019/06/11	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/06/11	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/06/11	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/06/11	<2.0		ug/L	
			Dissolved Boron (B)	2019/06/11	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/06/11	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/06/11	<100		ug/L	
			Dissolved Chromium (Cr)	2019/06/11	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/06/11	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/06/11	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/06/11	<50		ug/L	
			Dissolved Lead (Pb)	2019/06/11	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/06/11	<100		ug/L	
			Dissolved Manganese (Mn)	2019/06/11	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/06/11	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/06/11	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/06/11	<100		ug/L	
			Dissolved Potassium (K)	2019/06/11	<100		ug/L	
			Dissolved Selenium (Se)	2019/06/11	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/06/11	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/06/11	<100		ug/L	
			Dissolved Strontium (Sr)	2019/06/11	<2.0		ug/L	
			Dissolved Thallium (Tl)	2019/06/11	<0.10		ug/L	
			Dissolved Tin (Sn)	2019/06/11	<2.0		ug/L	
			Dissolved Titanium (Ti)	2019/06/11	<2.0		ug/L	
			Dissolved Uranium (U)	2019/06/11	<0.10		ug/L	
			Dissolved Vanadium (V)	2019/06/11	<2.0		ug/L	
			Dissolved Zinc (Zn)	2019/06/11	<5.0		ug/L	
6167410	MLB	RPD	Dissolved Aluminum (Al)	2019/06/11	NC		%	20
			Dissolved Antimony (Sb)	2019/06/11	NC		%	20
			Dissolved Arsenic (As)	2019/06/11	NC		%	20
			Dissolved Barium (Ba)	2019/06/11	NC		%	20
			Dissolved Beryllium (Be)	2019/06/11	NC		%	20
			Dissolved Bismuth (Bi)	2019/06/11	NC		%	20
			Dissolved Boron (B)	2019/06/11	NC		%	20
			Dissolved Cadmium (Cd)	2019/06/11	NC		%	20
			Dissolved Calcium (Ca)	2019/06/11	NC		%	20
			Dissolved Chromium (Cr)	2019/06/11	NC		%	20
			Dissolved Cobalt (Co)	2019/06/11	NC		%	20
			Dissolved Copper (Cu)	2019/06/11	NC		%	20
			Dissolved Iron (Fe)	2019/06/11	NC		%	20
			Dissolved Lead (Pb)	2019/06/11	NC		%	20
			Dissolved Magnesium (Mg)	2019/06/11	NC		%	20
			Dissolved Manganese (Mn)	2019/06/11	NC		%	20
			Dissolved Molybdenum (Mo)	2019/06/11	NC		%	20
			Dissolved Nickel (Ni)	2019/06/11	NC		%	20
			Dissolved Phosphorus (P)	2019/06/11	NC		%	20
			Dissolved Potassium (K)	2019/06/11	NC		%	20
			Dissolved Selenium (Se)	2019/06/11	NC		%	20
			Dissolved Silver (Ag)	2019/06/11	NC		%	20
			Dissolved Sodium (Na)	2019/06/11	NC		%	20
			Dissolved Strontium (Sr)	2019/06/11	NC		%	20
			Dissolved Thallium (Tl)	2019/06/11	NC		%	20
			Dissolved Tin (Sn)	2019/06/11	NC		%	20



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Titanium (Ti)	2019/06/11	NC		%	20
			Dissolved Uranium (U)	2019/06/11	NC		%	20
			Dissolved Vanadium (V)	2019/06/11	NC		%	20
			Dissolved Zinc (Zn)	2019/06/11	NC		%	20
6167496	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/11		NC	%	85 - 115
6167496	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/11		97	%	80 - 120
6167496	SSI	Method Blank	Total Organic Carbon (C)	2019/06/11	<0.50		mg/L	
6167496	SSI	RPD	Total Organic Carbon (C)	2019/06/11	4.4 (1)		%	15
6167568	MCN	Matrix Spike [JXN059-06]	Nitrogen (Ammonia Nitrogen)	2019/06/10		101	%	80 - 120
6167568	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10		105	%	80 - 120
6167568	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10	<0.050		mg/L	
6167568	MCN	RPD [JXN059-06]	Nitrogen (Ammonia Nitrogen)	2019/06/10	NC		%	20
6167585	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/06/11		NC	%	80 - 120
6167585	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10		107	%	80 - 120
6167585	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/06/10	<0.050		mg/L	
6167585	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2019/06/11	1.3		%	20
6169233	BBD	QC Standard	Salinity	2019/06/11		102	%	80 - 120
6169233	BBD	Method Blank	Salinity	2019/06/11	<2.0		N/A	
6169233	BBD	RPD	Salinity	2019/06/11	NC		%	25
6169238	EMT	QC Standard	pH	2019/06/11		101	%	97 - 103
6169238	EMT	RPD	pH	2019/06/11	1.4		%	N/A
6169239	EMT	Spiked Blank	Conductivity	2019/06/11		102	%	80 - 120
6169239	EMT	Method Blank	Conductivity	2019/06/11	<1.0		uS/cm	
6169239	EMT	RPD	Conductivity	2019/06/11	0.34		%	10
6169240	EMT	Matrix Spike	Dissolved Fluoride (F-)	2019/06/11		99	%	80 - 120
6169240	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/11		102	%	80 - 120
6169240	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/11	<0.10		mg/L	
6169240	EMT	RPD	Dissolved Fluoride (F-)	2019/06/11	NC		%	20
6169370	SSI	Matrix Spike [JXN065-10]	Dissolved Organic Carbon (C)	2019/06/11		93	%	85 - 115
6169370	SSI	Spiked Blank	Dissolved Organic Carbon (C)	2019/06/11		95	%	80 - 120
6169370	SSI	Method Blank	Dissolved Organic Carbon (C)	2019/06/11	<0.5		mg/L	
6169370	SSI	RPD [JXN065-10]	Dissolved Organic Carbon (C)	2019/06/11	NC		%	15
6169558	SRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/06/11		97	%	80 - 120
6169558	SRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/06/11		102	%	80 - 120
6169558	SRM	Method Blank	Dissolved Chloride (Cl-)	2019/06/11	<1.0		mg/L	
6169558	SRM	RPD	Dissolved Chloride (Cl-)	2019/06/11	1.4		%	25
6169565	SRM	Matrix Spike	Dissolved Sulphate (SO4)	2019/06/11		106	%	80 - 120
6169565	SRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/06/11		108	%	80 - 120
6169565	SRM	Method Blank	Dissolved Sulphate (SO4)	2019/06/11	<2.0		mg/L	
6169565	SRM	RPD	Dissolved Sulphate (SO4)	2019/06/11	2.5		%	25
6169567	SRM	Matrix Spike	Reactive Silica (SiO2)	2019/06/11		99	%	80 - 120
6169567	SRM	Spiked Blank	Reactive Silica (SiO2)	2019/06/11		99	%	80 - 120
6169567	SRM	Method Blank	Reactive Silica (SiO2)	2019/06/11	<0.50		mg/L	
6169567	SRM	RPD	Reactive Silica (SiO2)	2019/06/11	3.8		%	25
6169570	SRM	Matrix Spike	Nitrite (N)	2019/06/11		97	%	80 - 120
6169570	SRM	Spiked Blank	Nitrite (N)	2019/06/11		102	%	80 - 120
6169570	SRM	Method Blank	Nitrite (N)	2019/06/11	<0.010		mg/L	
6169570	SRM	RPD	Nitrite (N)	2019/06/11	NC		%	20
6169571	SRM	Matrix Spike	Nitrate + Nitrite (N)	2019/06/11		97	%	80 - 120
6169571	SRM	Spiked Blank	Nitrate + Nitrite (N)	2019/06/11		103	%	80 - 120
6169571	SRM	Method Blank	Nitrate + Nitrite (N)	2019/06/11	<0.050		mg/L	
6169571	SRM	RPD	Nitrate + Nitrite (N)	2019/06/11	5.0		%	25
6169817	BKE	Matrix Spike	Total Cyanide (CN)	2019/06/11		105	%	80 - 120
6169817	BKE	Spiked Blank	Total Cyanide (CN)	2019/06/11		100	%	80 - 120



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6169817	BKE	Method Blank	Total Cyanide (CN)	2019/06/11	<0.0050		mg/L	
6169817	BKE	RPD	Total Cyanide (CN)	2019/06/11	4.6		%	20
6170015	EMT	QC Standard	pH	2019/06/12		101	%	97 - 103
6170015	EMT	RPD	pH	2019/06/12	1.7		%	N/A
6170024	EMT	Spiked Blank	Conductivity	2019/06/12		102	%	80 - 120
6170024	EMT	Method Blank	Conductivity	2019/06/12	<1.0		uS/cm	
6170024	EMT	RPD	Conductivity	2019/06/12	1.6		%	10
6170033	EMT	Matrix Spike	Dissolved Fluoride (F-)	2019/06/12		98	%	80 - 120
6170033	EMT	Spiked Blank	Dissolved Fluoride (F-)	2019/06/12		96	%	80 - 120
6170033	EMT	Method Blank	Dissolved Fluoride (F-)	2019/06/12	<0.10		mg/L	
6170033	EMT	RPD	Dissolved Fluoride (F-)	2019/06/12	NC		%	20
6170231	AM6	QC Standard	Total Dissolved Solids	2019/06/12		98	%	80 - 120
6170231	AM6	Method Blank	Total Dissolved Solids	2019/06/12	<20 (2)		mg/L	
6170231	AM6	RPD	Total Dissolved Solids	2019/06/12	0		%	25
6171834	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/12		92	%	85 - 115
6171834	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/12		98	%	80 - 120
6171834	SSI	Method Blank	Total Organic Carbon (C)	2019/06/12	<0.50		mg/L	
6171834	SSI	RPD	Total Organic Carbon (C)	2019/06/12	5.0 (1)		%	15
6171839	SSI	Matrix Spike	Total Organic Carbon (C)	2019/06/12		93	%	85 - 115
6171839	SSI	Spiked Blank	Total Organic Carbon (C)	2019/06/12		98	%	80 - 120
6171839	SSI	Method Blank	Total Organic Carbon (C)	2019/06/12	<0.50		mg/L	
6171839	SSI	RPD	Total Organic Carbon (C)	2019/06/12	3.1		%	15
6172263	RK6	Spiked Blank	Radium-226	2019/06/21		101	%	85 - 115
6172263	RK6	Method Blank	Radium-226	2019/06/21	<0.010		Bq/L	
6172263	RK6	RPD [JXN059-02]	Radium-226	2019/06/21	NC		%	N/A
6174090	BBD	Matrix Spike	Acidity	2019/06/13		103	%	80 - 120
6174090	BBD	Spiked Blank	Acidity	2019/06/13		102	%	80 - 120
6174090	BBD	Method Blank	Acidity	2019/06/13	<5.0		mg/L	
6174090	BBD	RPD	Acidity	2019/06/13	NC		%	25
6174133	PBA	Matrix Spike	Total Tungsten (W)	2019/06/13		102	%	80 - 120
6174133	PBA	Spiked Blank	Total Tungsten (W)	2019/06/13		98	%	80 - 120
6174133	PBA	Method Blank	Total Tungsten (W)	2019/06/13	<1.0		ug/L	
6174133	PBA	RPD	Total Tungsten (W)	2019/06/13	NC		%	20
6193032	éFQ	Spiked Blank	WAD Cyanide (Free)	2019/06/16		119	%	80 - 120
			WAD Cyanide (Free)	2019/06/16		119	%	80 - 120
6193032	éFQ	Method Blank	WAD Cyanide (Free)	2019/06/16	<0.0030		mg/L	
			WAD Cyanide (Free)	2019/06/16	<0.0030		mg/L	
6193032	éFQ	RPD [JXN059-14]	WAD Cyanide (Free)	2019/06/16	NC		%	25

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.

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 turbidity.

(2) Elevated RDL due to method blank performance.



BUREAU
VERITAS

BV Labs Job #: B9F2843
Report Date: 2019/06/25

McCallum Environmental
Client Project #: Fifteen Mile Stream
Your P.O. #: 5628

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Anastassia Hamanov, Scientific Specialist

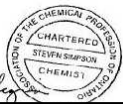


Caroline Bougie, B.Sc. Chemist

Eric Dearman, Scientific Specialist

Gina Thompson, Inorganics General Chemistry Supervisor

Mike MacGillivray, Scientific Specialist (Inorganics)



Steven Simpson, Lab Director

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**DALHOUSIE
UNIVERSITY**

Inspiring Minds

Department of Oceanography
1355 Oxford St
Halifax, NS
B3H 4R2

Determination of chlorophyll a by fluorescence

Client: Bureau Veritas Laboratories, 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Maryann Comeau

Received: 2019-06-06

Project #: B9F2843

Completed: 2019-06-10

Hugh MacIntyre

Hugh MacIntyre, Ph.D.

Chl *a* (chlorophyll *a*; $\mu\text{g L}^{-1}$) determined by the acidification method (Holm-Hansen et al., 1965). Estimates made with the non-acidification method (Welschmeyer, 1994) are shown for comparison.

The non-acidification method is considered more reliable than the acidification method in correcting for bias due to the contributions of chlorophyll *b* and chlorophyll degradation products.

Holm-Hansen O, Lorenzen CJ, Holmes RW, Strickland JDH (1965) Fluorometric determination of chlorophyll.

J Conseil 30:3-15

Welschmeyer NA (1994) Fluorometric analysis of chlorophyll *a* in the presence of chlorophyll *b* and phaeopigments.

Limnol Oceanogr 39:1985-1992

Contractor ID	Client ID	Chl <i>a</i> (acidification)	Chl <i>a</i> (non-acidification)
JXN059-01R	SW 13 SURFACE	2.47	2.36
JXN061-01R	SW 13 DEPTH	1.17	1.2
JXN063-01R	FIELD/FILTER BLANK 3	0.504	0.433



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B83573	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner	P.O. #	5628	B9F2843	719798
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	Fifteen Mile Stream		
Phone	(902) 384-2772 Fax: (902) 384-2772	Phone	(902) 880-6375 Fax:	Project Name		C#19798-04-01	Maryann Comeau
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com	Site #			

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:			
		Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	Please provide advance notice for rush projects	

** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Regular (Standard) TAT: (will be applied if Rush TAT is not specified):
 Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
 Date Required: Time Required:

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals (Include Zirconium)	Mercury - Total (CVAA,LL)	Methyl Mercury (sub from Bedford)	Fluoride	Chemical Oxygen Demand (COD)	Chlorophyll A (Sub from Bedford)	Salinity	Total Suspended Solids	Acidity (CaCO3) in water	Total Dissolved Solids (Filt. Residue)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 13 surface	19/06/05	10:15	H ₂ O			X	X	X	X	X	X	X	X	X	X		
2	SW 13 depth	"	10:45	"			X	X	X	X	X	X	X	X	X	X		
3	Field/Filter Blank 3	"	"	"			X	X	X	X	X	X	X	X	X	X		
4	Trip Blank	"	"	"			X	X	X	X	X	X	X	X	X	X		
5																		
6																		
7																		2018 JUN 5 15:45
8																		
9																		
10																		

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# Jars used and not submitted	Lab Use Only
Ry Gardiner Ryan Gardiner	19/06/05		[Signature]				Time Sensitive <input type="checkbox"/> Temperature (°C) on Receipt 10.6, 0/5, 4, 1 Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name: #16589 Atlantic Mining NS Corp	Company Name: #22600 McCallum Environmental	Quotation #: B83573	Maxxam Job #: 719798	Bottle Order #:			
Contact Name: Accounts Payable	Contact Name: Ryan Gardiner	P.O. #: 5628	113 200/1606 B95 B9F2843		719798		
Address: 6749 Moose River Rd	Address: 2 Bluewater Rd., Suite 135	Project #: Fifteen Mile Stream	Chain Of Custody Record		Project Manager		
Address: Middle Musquodoboit NS B0N 1X0	Address: Bedford NS B4B 1G7	Project Name:	Site #:		Maryann Comeau		
Phone: (902) 384-2772 Fax: (902) 384-2772	Phone: (902) 880-6375 Fax:	Site #:	Sampled By:		C#719798-04-02		
Email: accounts@atlanticgoldcorporation.com	Email: ryan@mccallumenvironmental.com						

Regulatory Criteria:	Special Instructions:	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:		
		Field Filtered & Preserved	Lab Filtration Required	Phosphorus Total Colourimetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al: RCAP-MS Diss(Field/Filter) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CVAAALL)	Please provide advance notice for rush projects	
													Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests.	

** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Please note: Standard TAT for certain tests such as BOD and Dibxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
 Date Required: Time Required:

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Phosphorus Total Colourimetry	Total Tungsten in Water	Str. Acid Diss. Cyanide water	Weak Acid Dissociable Cyanides	Radium Isotopes by Alpha Spectrometry	Al: RCAP-MS Diss(Field/Filter) Includes Zirconium	Organic carbon - Diss (DOC) (as rec'd)	Dissolved Tungsten	Mercury - Dissolved (CVAAALL)	# of Bottles	Comments / Hazards / Other Required Analysis
1	SW 13 surface	19/06/05	10:15	H ₂ O			X	X	X	X	X	X	X	X	X		
2	SW 13 depth	"	10:45	"			X	X	X	X	X	X	X	X	X		
3	Field/Filter Blank 3	"	"	"			X	X	X	X	X	X	X	X	X		
4	Trip Blank	"	"	"			X	X	X	X	X	X	X	X	X		
5																	
6																	
7																	
8																	
9																	
10																	

RELINQUISHED BY: (Signature/Print) Ryan Gardiner	Date: (YY/MM/DD) 19/06/05	Time	RECEIVED BY: (Signature/Print) [Signature]	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only
							Time Sensitive <input type="checkbox"/>
							Temperature (°C) on Receipt: 10.6, 0/5.4, 1
							Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Methyl Mercury Results

Flett Research Ltd.

440 DeSalaberry Ave. Winnipeg, MB R2L 0Y7
Fax/Phone (204) 667-2505

E-mail: flett@flettresearch.ca Webpage: http://www.flettresearch.ca

MTWATR061819JS2
Page 1 of 1

CLIENT: Bureau Veritas - Bedford: B9F2843

200 Bluewater Road, Suite 105
Bedford, NS B4B 1G9

Date Received: June 7, 2019

Sampling Date: June 5, 2019

Matrix: Water

Transaction ID: 894

PO/Contract No.:

Date Analysed: June 18, 2019

Analyst(s): Jason S.

Analytical Method: M10211: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and CVAFS - Tekran 2700 Mercury Analyser (Version 2)

Comments: Samples SW 13 SURFACE and SW 13 DEPTH had particulates present.

Detection Limit: The method detection limit (MDL) for this method is 0.0035 ng/L. The MDL is the minimum concentration that can be reported with 99% confidence that the measured concentration exceeds zero and is based on the distillation of 45mL of raw sample and analysis of 20mL of a 40mL distillate.

For reporting purpose samples are flagged when concentration is below the methods EPA defined minimum level (ML= 0.0135 ng/L). As concentration rises above the MDL confidence that the analyte is present approaches 100% at and above the ML.

Estimated Uncertainty: Overall estimated uncertainty (95 % confidence, K=2) of this method varies with analyte concentration. When methyl mercury concentrations exceed 0.03ng/L the estimated uncertainty is ±15%. At a concentration of 0.01ng/L uncertainty is ± 23%. Method uncertainty for concentrations at MDL (0.0035ng/L) is ±75%.

Results authorized by **Dr. Robert J. Flett, Chief Scientist**

Blanks	Pg of CH3Hg in the Ethylation Blank		Mean Gross Peak Area	CH3Hg in the Ethylation Blank (ng/L)					
				assumes volume is 30mL					
Ethylation blank (H ₂ O+Reagents)	0.11		8.84	0.004					
Mean Eth. Blank (last 30 runs)	0.11								
	Net Pg CH3Hg in the Method Blank (Eth. Blank subtracted)	Gross Peak Area	Net CH3Hg in the Method Blank (ng/L) (Eth. Blank subtracted)						
Method Blank 1	0.25	29.32	0.010						
Method Blank 2	0.24	28.74	0.010						
Method Blank 3	0.24	28.81	0.011						
Mean Method Blank			0.010						
Mean Calibration Factor (area units / pg)	81.91 ± 2.8 %RSD								
QUALITY DATA	Spike Recovery	Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)	
	Matrix Spike (MS) and Matrix Spike Duplicate (MSD)								
		Mean of Spike Recoveries from June 16, 2019							
								85.9	
QC Samples	Sample ID (Details)	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg as Hg (ng/L)	CH ₃ Hg Recovery (%)		
Ongoing Precision & Recovery (OPR)	MeOPR ID1701 (1000ng/L)	(beginning of run)	1116.36	0.050	100%	936	93.6		
	MeOPR ID1701 (1000ng/L)	(end of run)	1017.45	0.050	100%	905	90.5		
	Mean of MeOPR								
						921	92.1		
Alternate Source Standard (A.S.S)	A.S.S.-Alfa ID1302 (1000 ng/L)		2358.92		100%	956	95.6		
LAB ID	Sampling Details	Sample ID	Date Sampled	Time Sampled	Sample Type	Gross Peak Area	Volume of Water Sample Distilled (mL)	% CH ₃ Hg Recovery Used for Calculations	Net CH ₃ Hg in the Sample as Hg (ng/L) (Ethylation & Method Blank subtracted) (recovery corrected)
95223	JXN059-15R	SW 13 SURFACE	June 5, 2019	10:15	DupA1	290.38	48.86	85.9%	0.163
95223	JXN059-15R	SW 13 SURFACE	June 5, 2019	10:15	DupA2	288.50	48.70	85.9%	0.144
95224	JXN061-15R	SW 13 DEPTH	June 5, 2019	10:45		268.84	47.26	85.9%	0.153
95225	JXN063-15R	FIELD/FILTER BLANK 3	June 5, 2019			25.69	47.53	85.9%	<0.0035

Q:\Clients A-L\Bureau Veritas - Bedford\2019\894\Methyl mercury\MTWATR061819JS2.xls

* : See 'Comments' section above for discussion.

This test report shall not be reproduced, except in full, without written approval of the laboratory.

Note: Results relate only to the items tested.

Dup : Duplicate - two subsamples of the same sample carried through the analytical procedure in an identical manner.



ISO/IEC 17025:2005 Accredited with the Canadian Association for Laboratory Accreditation

M10211-1 Version 05/17/19

Your Project #: FMS
 Site Location: Fifteen Mile Stream
 Your C.O.C. #: 655218-01-01, 655218-02-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2018/04/10

Report #: R5071240

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B874129

Received: 2018/04/04, 09:49

Sample Matrix: Water
 # Samples Received: 13

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Carbonate, Bicarbonate and Hydroxide	13	N/A	2018/04/05 N/A	SM 22 4500-CO2 D
Alkalinity	13	N/A	2018/04/05 ATL SOP 00013	EPA 310.2 R1974 m
Chloride	13	N/A	2018/04/05 ATL SOP 00014	SM 22 4500-Cl- E m
Colour	13	N/A	2018/04/05 ATL SOP 00020	SM 22 2120C m
Conductance - water	13	N/A	2018/04/05 ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3)	13	N/A	2018/04/06 ATL SOP 00048	SM 22 2340 B
Mercury - Dissolved (CVAA,LL)	13	2018/04/06	2018/04/09 ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	13	2018/04/06	2018/04/09 ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	6	2018/04/05	2018/04/05 ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS	7	2018/04/05	2018/04/06 ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	13	N/A	2018/04/06 N/A	Auto Calc.
Anion and Cation Sum	13	N/A	2018/04/06 N/A	Auto Calc.
Nitrogen Ammonia - water	13	N/A	2018/04/05 ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	13	N/A	2018/04/05 ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	13	N/A	2018/04/05 ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	13	N/A	2018/04/06 ATL SOP 00018	ASTM D3867-16
pH (1)	13	N/A	2018/04/05 ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	13	N/A	2018/04/06 ATL SOP 00021	SM 22 4500-P E m
Sat. pH and Langelier Index (@ 20C)	13	N/A	2018/04/06 ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	13	N/A	2018/04/06 ATL SOP 00049	Auto Calc.
Reactive Silica	13	N/A	2018/04/05 ATL SOP 00022	EPA 366.0 m
Sulphate	13	N/A	2018/04/05 ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	13	N/A	2018/04/06 N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	4	N/A	2018/04/05 ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (2)	9	N/A	2018/04/06 ATL SOP 00203	SM 23 5310B m
Turbidity	13	N/A	2018/04/06 ATL SOP 00011	EPA 180.1 R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

Your Project #: FMS
Site Location: Fifteen Mile Stream
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MAXXAM JOB #: B874129

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All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

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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) 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.

(2) 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.

Maryann Comeau, Project Manager

Email: MComeau@maxxam.ca

Phone# (902) 420-0203

=====
This report has been generated and distributed using a secure automated process.

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		GJP876	GJP877		GJP877		GJP878	GJP879	
Sampling Date		2018/04/02 13:00	2018/04/02 11:50		2018/04/02 11:50		2018/04/03 11:00	2018/04/02 13:40	
COC Number		655218-01-01	655218-01-01		655218-01-01		655218-01-01	655218-01-01	
	UNITS	SW1	SW2	RDL	SW2 Lab-Dup	RDL	SW3	SW4	RDL
Calculated Parameters									
Anion Sum	me/L	0.150	0.140	N/A			0.140	0.270	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	ND	ND	1.0			ND	5.4	1.0
Calculated TDS	mg/L	13	11	1.0			13	19	1.0
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	ND	1.0			ND	ND	1.0
Cation Sum	me/L	0.200	0.180	N/A			0.190	0.290	N/A
Hardness (CaCO3)	mg/L	3.4	3.0	1.0			3.1	7.2	1.0
Ion Balance (% Difference)	%	14.3	12.5	N/A			15.2	3.57	N/A
Langelier Index (@ 20C)	N/A	NC	NC				NC	-3.79	
Langelier Index (@ 4C)	N/A	NC	NC				NC	-4.04	
Nitrate (N)	mg/L	0.054	ND	0.050			ND	0.10	0.050
Saturation pH (@ 20C)	N/A	NC	NC				NC	10.2	
Saturation pH (@ 4C)	N/A	NC	NC				NC	10.5	
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	ND	ND	5.0			ND	5.4	5.0
Dissolved Chloride (Cl)	mg/L	5.2	4.9	1.0			5.0	5.6	1.0
Colour	TCU	44	23	5.0			ND	24	5.0
Nitrate + Nitrite (N)	mg/L	0.054	ND	0.050			ND	0.10	0.050
Nitrite (N)	mg/L	ND	ND	0.010			ND	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	ND	0.050			ND	ND	0.050
Total Organic Carbon (C)	mg/L	6.3	4.7	0.50	4.7	0.50	2.6	4.2	0.50
Orthophosphate (P)	mg/L	ND	ND	0.010			ND	ND	0.010
pH	pH	5.32	5.60	N/A			6.04	6.42	N/A
Reactive Silica (SiO2)	mg/L	3.0	2.0	0.50			3.6	3.2	0.50
Dissolved Sulphate (SO4)	mg/L	ND	ND	2.0			ND	ND	2.0
Turbidity	NTU	0.50	0.86	0.10			0.75	0.96	0.10
Conductivity	uS/cm	26	23	1.0			24	34	1.0
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable ND = Not detected									

RESULTS OF ANALYSES OF WATER

Maxxam ID		GJP879		GJP880	GJP881	GJP882	GJP883		GJP883	
Sampling Date		2018/04/02 13:40		2018/04/02 10:50	2018/04/02 09:40	2018/04/03 15:25	2018/04/02 15:05		2018/04/02 15:05	
COC Number		655218-01-01		655218-01-01	655218-01-01	655218-01-01	655218-01-01		655218-01-01	
	UNITS	SW4 Lab-Dup	RDL	SW5	SW6	SW7	SW8	RDL	SW8 Lab-Dup	RDL

Calculated Parameters										
Anion Sum	me/L			0.140	0.190	0.140	0.210	N/A		
Bicarb. Alkalinity (calc. as CaCO3)	mg/L			ND	ND	ND	ND	1.0		
Calculated TDS	mg/L			11	14	12	15	1.0		
Carb. Alkalinity (calc. as CaCO3)	mg/L			ND	ND	ND	ND	1.0		
Cation Sum	me/L			0.180	0.240	0.200	0.250	N/A		
Hardness (CaCO3)	mg/L			3.2	3.9	3.4	3.9	1.0		
Ion Balance (% Difference)	%			12.5	11.6	17.7	8.70	N/A		
Langelier Index (@ 20C)	N/A			NC	NC	NC	NC			
Langelier Index (@ 4C)	N/A			NC	NC	NC	NC			
Nitrate (N)	mg/L			ND	ND	0.061	ND	0.050		
Saturation pH (@ 20C)	N/A			NC	NC	NC	NC			
Saturation pH (@ 4C)	N/A			NC	NC	NC	NC			

Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L			ND	ND	ND	ND	5.0		
Dissolved Chloride (Cl)	mg/L			5.1	6.7	4.9	7.3	1.0		
Colour	TCU			32	32	16	35	5.0		
Nitrate + Nitrite (N)	mg/L			ND	ND	0.061	ND	0.050		
Nitrite (N)	mg/L			ND	ND	ND	ND	0.010		
Nitrogen (Ammonia Nitrogen)	mg/L			ND	ND	ND	ND	0.050		
Total Organic Carbon (C)	mg/L			5.0	5.3	4.6	5.6	0.50	5.6	0.50
Orthophosphate (P)	mg/L			ND	ND	ND	ND	0.010		
pH	pH			5.57	5.78	5.28	5.94	N/A		
Reactive Silica (SiO2)	mg/L			1.9	2.4	2.5	2.6	0.50		
Dissolved Sulphate (SO4)	mg/L			ND	ND	ND	ND	2.0		
Turbidity	NTU	0.94	0.10	0.49	0.70	0.25	0.70	0.10		
Conductivity	uS/cm			24	32	27	33	1.0		

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 ND = Not detected

RESULTS OF ANALYSES OF WATER

Maxxam ID		GJP884	GJP885	GJP889	GJP890		GJP891	
Sampling Date		2018/04/03 14:00	2018/04/03 13:00	2018/04/03 11:55	2018/04/02 16:05		2018/04/02 16:25	
COC Number		655218-01-01	655218-01-01	655218-02-01	655218-02-01		655218-02-01	
	UNITS	SW9	SW10	SW11	SW12	RDL	SW13	RDL
Calculated Parameters								
Anion Sum	me/L	0.220	0.200	0.160	0.130	N/A	0.150	N/A
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	ND	ND	ND	1.0	ND	1.0
Calculated TDS	mg/L	16	16	15	11	1.0	12	1.0
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	ND	ND	ND	ND	1.0	ND	1.0
Cation Sum	me/L	0.270	0.280	0.230	0.190	N/A	0.190	N/A
Hardness (CaCO ₃)	mg/L	4.0	3.9	3.9	3.3	1.0	3.0	1.0
Ion Balance (% Difference)	%	10.2	16.7	18.0	18.8	N/A	11.8	N/A
Langelier Index (@ 20C)	N/A	NC	NC	NC	NC		NC	
Langelier Index (@ 4C)	N/A	NC	NC	NC	NC		NC	
Nitrate (N)	mg/L	ND	ND	ND	ND	0.050	ND	0.050
Saturation pH (@ 20C)	N/A	NC	NC	NC	NC		NC	
Saturation pH (@ 4C)	N/A	NC	NC	NC	NC		NC	
Inorganics								
Total Alkalinity (Total as CaCO ₃)	mg/L	ND	ND	ND	ND	5.0	ND	5.0
Dissolved Chloride (Cl)	mg/L	7.8	7.1	5.7	4.8	1.0	5.2	1.0
Colour	TCU	28	26	42	46	5.0	100 (1)	25
Nitrate + Nitrite (N)	mg/L	ND	ND	ND	ND	0.050	ND	0.050
Nitrite (N)	mg/L	ND	ND	ND	ND	0.010	ND	0.010
Nitrogen (Ammonia Nitrogen)	mg/L	ND	ND	ND	ND	0.050	ND	0.050
Total Organic Carbon (C)	mg/L	5.1	5.3	8.4	6.4	0.50	8.1	0.50
Orthophosphate (P)	mg/L	ND	ND	ND	ND	0.010	ND	0.010
pH	pH	5.67	5.35	5.34	5.53	N/A	5.62	N/A
Reactive Silica (SiO ₂)	mg/L	2.4	2.7	4.1	2.1	0.50	2.5	0.50
Dissolved Sulphate (SO ₄)	mg/L	ND	ND	ND	ND	2.0	ND	2.0
Turbidity	NTU	0.66	0.72	0.60	0.86	0.10	0.50	0.10
Conductivity	uS/cm	35	34	30	26	1.0	28	1.0
RDL = Reportable Detection Limit N/A = Not Applicable ND = Not detected (1) Elevated reporting limit due to sample matrix.								

RESULTS OF ANALYSES OF WATER

Maxxam ID		GJP891	
Sampling Date		2018/04/02 16:25	
COC Number		655218-02-01	
	UNITS	SW13 Lab-Dup	RDL
Inorganics			
pH	pH	5.43	N/A
Conductivity	uS/cm	28	1.0
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable			

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		GJP876		GJP876		GJP877		GJP878		GJP879		GJP880	
Sampling Date		2018/04/02 13:00		2018/04/02 13:00		2018/04/02 11:50		2018/04/03 11:00		2018/04/02 13:40		2018/04/02 10:50	
COC Number		655218-01-01		655218-01-01		655218-01-01		655218-01-01		655218-01-01		655218-01-01	
	UNITS	SW1	RDL	SW1 Lab-Dup	RDL	SW2	SW3	SW4	SW5	RDL			

Metals													
Dissolved Mercury (Hg)	ug/L	ND	0.013	ND	0.013	ND	ND	ND	ND	ND	0.013		
Total Mercury (Hg)	ug/L	ND	0.013			ND	ND	ND	ND	0.013			

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		GJP881	GJP882	GJP883	GJP884	GJP885	GJP889	GJP890	
Sampling Date		2018/04/02 09:40	2018/04/03 15:25	2018/04/02 15:05	2018/04/03 14:00	2018/04/03 13:00	2018/04/03 11:55	2018/04/02 16:05	
COC Number		655218-01-01	655218-01-01	655218-01-01	655218-01-01	655218-01-01	655218-02-01	655218-02-01	
	UNITS	SW6	SW7	SW8	SW9	SW10	SW11	SW12	RDL

Metals									
Dissolved Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.013
Total Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.013

RDL = Reportable Detection Limit
ND = Not detected

Maxxam ID		GJP890		GJP891	
Sampling Date		2018/04/02 16:05		2018/04/02 16:25	
COC Number		655218-02-01		655218-02-01	
	UNITS	SW12 Lab-Dup	RDL	SW13	RDL

Metals					
Dissolved Mercury (Hg)	ug/L			ND	0.013
Total Mercury (Hg)	ug/L	ND	0.013	ND	0.013

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		GJP876	GJP877	GJP878	GJP879	GJP880	GJP881	GJP882	
Sampling Date		2018/04/02 13:00	2018/04/02 11:50	2018/04/03 11:00	2018/04/02 13:40	2018/04/02 10:50	2018/04/02 09:40	2018/04/03 15:25	
COC Number		655218-01-01	655218-01-01	655218-01-01	655218-01-01	655218-01-01	655218-01-01	655218-01-01	
	UNITS	SW1	SW2	SW3	SW4	SW5	SW6	SW7	RDL

Metals									
Total Aluminum (Al)	ug/L	200	140	49	140	140	170	99	5.0
Total Antimony (Sb)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Arsenic (As)	ug/L	1.4	ND	ND	35	3.4	1.1	ND	1.0
Total Barium (Ba)	ug/L	6.6	3.7	5.9	2.7	3.4	5.3	2.9	1.0
Total Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Bismuth (Bi)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Boron (B)	ug/L	ND	ND	ND	ND	ND	ND	ND	50
Total Cadmium (Cd)	ug/L	0.017	0.019	0.012	0.019	0.014	0.022	0.014	0.010
Total Calcium (Ca)	ug/L	730	580	650	2200	690	830	760	100
Total Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Cobalt (Co)	ug/L	ND	ND	ND	0.58	ND	ND	ND	0.40
Total Copper (Cu)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Iron (Fe)	ug/L	170	100	ND	410	130	150	93	50
Total Lead (Pb)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.50
Total Magnesium (Mg)	ug/L	390	370	340	430	360	440	370	100
Total Manganese (Mn)	ug/L	35	36	8.3	150	41	66	73	2.0
Total Molybdenum (Mo)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Nickel (Ni)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	ND	100
Total Potassium (K)	ug/L	470	300	550	390	330	330	330	100
Total Selenium (Se)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0
Total Silver (Ag)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Sodium (Na)	ug/L	2400	2400	2500	2700	2400	3400	2600	100
Total Strontium (Sr)	ug/L	6.8	6.4	7.3	8.4	5.7	6.5	4.4	2.0
Total Thallium (Tl)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Tin (Sn)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Titanium (Ti)	ug/L	2.8	ND	ND	ND	ND	ND	ND	2.0
Total Uranium (U)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10
Total Vanadium (V)	ug/L	ND	ND	ND	ND	ND	ND	ND	2.0
Total Zinc (Zn)	ug/L	ND	ND	ND	ND	ND	ND	ND	5.0

RDL = Reportable Detection Limit
ND = Not detected

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		GJP883	GJP884	GJP885	GJP889	GJP890	GJP891	
Sampling Date		2018/04/02 15:05	2018/04/03 14:00	2018/04/03 13:00	2018/04/03 11:55	2018/04/02 16:05	2018/04/02 16:25	
COC Number		655218-01-01	655218-01-01	655218-01-01	655218-02-01	655218-02-01	655218-02-01	
	UNITS	SW8	SW9	SW10	SW11	SW12	SW13	RDL
Metals								
Total Aluminum (Al)	ug/L	190	200	200	300	160	140	5.0
Total Antimony (Sb)	ug/L	ND	ND	ND	ND	ND	ND	1.0
Total Arsenic (As)	ug/L	ND	ND	ND	ND	ND	ND	1.0
Total Barium (Ba)	ug/L	6.9	7.4	8.3	3.6	3.7	3.4	1.0
Total Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	ND	1.0
Total Bismuth (Bi)	ug/L	ND	ND	ND	ND	ND	ND	2.0
Total Boron (B)	ug/L	ND	ND	ND	ND	ND	ND	50
Total Cadmium (Cd)	ug/L	0.033	0.037	0.038	0.018	0.022	0.015	0.010
Total Calcium (Ca)	ug/L	840	860	800	800	650	520	100
Total Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	ND	1.0
Total Cobalt (Co)	ug/L	1.2	ND	ND	ND	ND	ND	0.40
Total Copper (Cu)	ug/L	ND	ND	ND	ND	ND	ND	2.0
Total Iron (Fe)	ug/L	130	100	120	180	260	480	50
Total Lead (Pb)	ug/L	ND	ND	ND	ND	ND	ND	0.50
Total Magnesium (Mg)	ug/L	430	450	450	450	410	410	100
Total Manganese (Mn)	ug/L	85	72	69	45	77	56	2.0
Total Molybdenum (Mo)	ug/L	ND	ND	ND	ND	ND	ND	2.0
Total Nickel (Ni)	ug/L	9.7	ND	ND	ND	ND	ND	2.0
Total Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	100
Total Potassium (K)	ug/L	380	320	840	400	350	400	100
Total Selenium (Se)	ug/L	ND	ND	ND	ND	ND	ND	1.0
Total Silver (Ag)	ug/L	ND	ND	ND	ND	ND	ND	0.10
Total Sodium (Na)	ug/L	3600	4100	4000	3000	2400	2400	100
Total Strontium (Sr)	ug/L	6.7	6.7	6.9	7.8	6.0	5.6	2.0
Total Thallium (Tl)	ug/L	ND	ND	ND	ND	ND	ND	0.10
Total Tin (Sn)	ug/L	ND	ND	ND	ND	ND	ND	2.0
Total Titanium (Ti)	ug/L	2.1	ND	ND	2.4	2.6	ND	2.0
Total Uranium (U)	ug/L	ND	ND	ND	ND	ND	ND	0.10
Total Vanadium (V)	ug/L	ND	ND	ND	ND	ND	ND	2.0
Total Zinc (Zn)	ug/L	ND	ND	7.6	ND	ND	ND	5.0
RDL = Reportable Detection Limit ND = Not detected								

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C
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Sample GJP876 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP877 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP878 [SW3] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP880 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP881 [SW6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP882 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP883 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP884 [SW9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP885 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP889 [SW11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

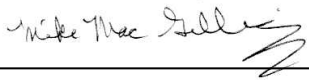
Sample GJP890 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GJP891 [SW13] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information			Project Information			Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental		Quotation #	B61799		Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner/Andy Walter		P.O. #			855218	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7		Project #	FMS		Chain Of Custody Record	
Phone	(902) 384-2772 x	Phone	(902) 880-6375 x		Project Name	Fifteen Mile Stream		Project Manager	
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com, andy@mccallumen		Site #			Maryann Comeau	
Regulatory Criteria:	Special Instructions	ANALYSIS REQUESTED (PLEASE BE SPECIFIC)			Turnaround Time (TAT) Required:				
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal		Field Filtered & Preserved Lab Filtration Required			Please provide advance notice for rush projects				
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM		Atlantic RCAP-MS Total Metals in Water			Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.				
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Mercury - Total (CVAA,LL)	Mercury - Dissolved (CVAA,LL)	Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required:		# of Bottles
1	SW1	02/04/2018	13:00	H ₂ O	X	X			
2	SW2	02/04/2018	11:50	H ₂ O	X	X			
3	SW3	03/04/2018	11:00	H ₂ O	X	X			
4	SW4	02/04/2018	13:40	H ₂ O	X	X			
5	SW5	02/04/2018	10:50	H ₂ O	X	X			
6	SW6	02/04/2018	09:40	H ₂ O	X	X			
7	SW7	03/04/2018	15:25	H ₂ O	X	X			
8	SW8	02/04/2018	15:05	H ₂ O	X	X			
9	SW9	03/04/2018	14:00	H ₂ O	X	X			
10	SW10	03/04/2018	13:00	H ₂ O	X	X			
RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted	
Ryan Gardiner		18/04/18	12:00	[Signature]				Lab Use Only	
						Time Sensitive		Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
						<input type="checkbox"/>		4.5.4	<input type="checkbox"/> Yes <input type="checkbox"/> No
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.								White: Maxxam Yellow: Client	
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.									

2018 APR 4 9:49



Maxxam Analytics International Corporation o/a Maxxam Analytics
 200 Bluewater Road, Bedford, Nova Scotia Canada B4B 1G9 Tel:(902) 420-0203 Toll-free:800-563-6266 Fax:(902) 420-8612 www.maxxam.ca

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#16589 Atlantic Mining NS Corp	Company Name	#22600 McCallum Environmental	Quotation #	B61799	Maxxam Job #	Bottle Order #:
Contact Name	Accounts Payable	Contact Name	Ryan Gardiner/Andy Walter	P.O. #		B874129	
Address	6749 Moose River Rd Middle Musquodoboit NS B0N 1X0	Address	2 Bluewater Rd., Suite 135 Bedford NS B4B 1G7	Project #	FMS		
Phone	(902) 384-2772 x Fax: (902) 384-2772 x	Phone	(902) 880-6375 x Fax:	Project Name	Fifteen Mile Stream	Chain Of Custody Record	
Email	accounts@atlanticgoldcorporation.com	Email	ryan@mccallumenvironmental.com, andy@mccallumen	Site #			Maryann Comeau
				Sampled By		C#655218-02-01	

Regulatory Criteria:		Special Instructions		ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:		
** Specify Matrix: Surface/Ground/Tapwater/Sewage/Effluent/Seawater Potable/Nonpotable/Tissue/Soil/Sludge/Metal														Please provide advance notice for rush projects		
														Regular (Standard) TAT: (will be applied if Rush TAT is not specified): <input type="checkbox"/> Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.		
														Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required: <input type="checkbox"/>		
														# of Bottles Comments / Hazards / Other Required Analysis		
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM																
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered & Preserved	Lab Filtration Required	Atlantic RCAP-MS Total Metals in Water	Mercury - Total (CVAA,LL)	Mercury - Dissolved (CVAA,LL)							
1	SW11	03/04/2018	11:55	H ₂ O			X	X	X							
2	SW12	02/04/2018	16:05	H ₂ O			X	X	X							
3	SW13	02/04/2018	16:25	H ₂ O			X	X	X							
4																
5																
6																2018 APR 4 9:49
7																
8																
9																
10																

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)		Time		RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)		Time		# jars used and not submitted		Lab Use Only	
<i>Ryan Gardiner</i>		18/04/04		12:00		<i>Andy Walter</i>								Time Sensitive <input type="checkbox"/> Temperature (°C) on Receipt 4.5.4 Custody Seal Intact on Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No	
* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.														White: Maxxam Yellow: Client	
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.															

Your P.O. #: 5628
 Your Project #: FIFTEEN MILE STREAM
 Your C.O.C. #: 707748-02-01

Attention: Ryan Gardiner

McCallum Environmental
 2 Bluewater Rd., Suite 135
 Bedford, NS
 CANADA B4B 1G7

Report Date: 2019/04/23
 Report #: R5680701
 Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B978807

Received: 2019/03/26, 16:32

Sample Matrix: Water
 # Samples Received: 19

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO3) in water (6)	10	N/A	2019/04/01		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	5	N/A	2019/03/28	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	14	N/A	2019/03/29	N/A	SM 23 4500-CO2 D
Alkalinity	12	N/A	2019/03/28	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	7	N/A	2019/03/29	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	12	N/A	2019/03/28	ATL SOP 00014	SM 23 4500-Cl- E m
Chloride	7	N/A	2019/04/01	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	10	N/A	2019/04/02	ATL SOP 00042	SM 23 5220D m
Colour	12	N/A	2019/03/28	ATL SOP 00020	SM 23 2120C m
Colour	7	N/A	2019/03/29	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	9	2019/03/29	2019/03/29	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (7)	9	N/A	2019/03/27	ATL SOP 00203	SM 23 5310B m
Conductance - water	5	N/A	2019/03/28	ATL SOP 00004	SM 23 2510B m
Conductance - water	14	N/A	2019/03/29	ATL SOP 00004	SM 23 2510B m
Fluoride	10	N/A	2019/03/29	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	19	N/A	2019/03/29	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	9	2019/03/27	2019/03/28	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	10	2019/04/01	2019/04/02	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	9	N/A	2019/03/28	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	10	2019/03/28	2019/03/28	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	9	N/A	2019/04/02	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	1	N/A	2019/04/01	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	8	N/A	2019/04/02	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	7	N/A	2019/03/29	N/A	Auto Calc.
Ion Balance (% Difference)	3	N/A	2019/04/01	N/A	Auto Calc.
Ion Balance (% Difference)	8	N/A	2019/04/02	N/A	Auto Calc.
Anion and Cation Sum	11	N/A	2019/03/29	N/A	Auto Calc.
Anion and Cation Sum	8	N/A	2019/04/02	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	9	2019/03/29	2019/04/02	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	11	N/A	2019/03/28	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water	8	N/A	2019/04/01	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	12	N/A	2019/03/28	ATL SOP 00016	USGS I-2547-11m

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/04/23
Report #: R5680701
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B978807

Received: 2019/03/26, 16:32

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Nitrogen - Nitrate + Nitrite	7	N/A	2019/03/29	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	12	N/A	2019/03/28	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrite	7	N/A	2019/03/29	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	12	N/A	2019/03/29	ATL SOP 00018	ASTM D3867-16
Nitrogen - Nitrate (as N)	7	N/A	2019/04/01	ATL SOP 00018	ASTM D3867-16
pH (8)	5	N/A	2019/03/28	ATL SOP 00003	SM 23 4500-H+ B m
pH (8)	14	N/A	2019/03/29	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	12	N/A	2019/03/28	ATL SOP 00021	SM 23 4500-P E m
Phosphorus - ortho	7	N/A	2019/04/01	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (3, 9)	4	N/A	2019/04/12	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Radium Isotopes by Alpha Spectrometry (3, 9)	4	N/A	2019/04/17	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (6)	10	N/A	2019/04/01		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	19	N/A	2019/03/29	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	19	N/A	2019/03/29	ATL SOP 00049	Auto Calc.
Reactive Silica	2	N/A	2019/03/28	ATL SOP 00022	EPA 366.0 m
Reactive Silica	17	N/A	2019/03/29	ATL SOP 00022	EPA 366.0 m
Sulphate	12	N/A	2019/03/28	ATL SOP 00023	ASTM D516-16 m
Sulphate	7	N/A	2019/04/01	ATL SOP 00023	ASTM D516-16 m
Chlorophyll A (Sub from Bedford) (4)	8	2019/03/27	2019/04/02		
Methyl Mercury (sub from Bedford) (5)	8	N/A	2019/04/04		EPA 1630
Total Dissolved Solids (Filt. Residue)	9	2019/03/28	2019/04/01	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	7	N/A	2019/03/29	N/A	Auto Calc.
Total Dissolved Solids (TDS calc)	4	N/A	2019/04/01	N/A	Auto Calc.
Total Dissolved Solids (TDS calc)	8	N/A	2019/04/02	N/A	Auto Calc.
Organic carbon - Total (TOC) (10)	19	N/A	2019/03/28	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	10	2019/04/01	2019/04/02	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	9	2019/03/28	2019/03/29	ATL SOP 00007	SM 23 2540D m
Turbidity	10	N/A	2019/03/28	ATL SOP 00011	EPA 180.1 R2 m

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/04/23
Report #: R5680701
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B978807
Received: 2019/03/26, 16:32

Sample Matrix: Water
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Turbidity	9	N/A	2019/03/29	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 Maxxam Analytics Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Maxxam Analytics Kitimat
- (4) This test was performed by Dalhousie Dept of Oceanography
- (5) This test was performed by Sub Bedford to Flett Research
- (6) Non-accredited test method
- (7) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (8) 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.
- (9) Radium-226 results have not been corrected for blanks.
- (10) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-02-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/04/23
Report #: R5680701
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B978807
Received: 2019/03/26, 16:32

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH826			JHH826			JHH827		
Sampling Date		2019/03/26 11:00			2019/03/26 11:00			2019/03/26 10:35		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch	SW2	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	0.0800	N/A	6039016				0.110	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008				<1.0	1.0	6039008
Calculated TDS	mg/L	9.0	1.0	6039029				9.0	1.0	6039029
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008				<1.0	1.0	6039008
Cation Sum	me/L	0.130	N/A	6039016				0.160	N/A	6039016
Hardness (CaCO3)	mg/L	2.2	1.0	6039012				2.6	1.0	6039012
Ion Balance (% Difference)	%	23.8	N/A	6039014				18.5	N/A	6039014
Langelier Index (@ 20C)	N/A	NC		6039026				NC		6039026
Langelier Index (@ 4C)	N/A	NC		6039027				NC		6039027
Nitrate (N)	mg/L	<0.050	0.050	6039019				<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A	NC		6039026				NC		6039026
Saturation pH (@ 4C)	N/A	NC		6039027				NC		6039027
Inorganics										
Acidity	mg/L	8.6	5.0	6046252				6.8	5.0	6046252
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6041142				<5.0	5.0	6041100
Total Chemical Oxygen Demand	mg/L	20	20	6046858				<20	20	6046858
Dissolved Chloride (Cl-)	mg/L	3.0	1.0	6041145				4.0	1.0	6041102
Colour	TCU	47	5.0	6041148				36	5.0	6041105
Total Dissolved Solids	mg/L	22	10	6043931				19	10	6043931
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043252				<0.10	0.10	6043252
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6041150				<0.050	0.050	6041108
Nitrite (N)	mg/L	<0.010	0.010	6041151				<0.010	0.010	6041109
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6041186				<0.050	0.050	6041186
Total Organic Carbon (C)	mg/L	5.1	0.50	6041507				5.4	0.50	6041507
Orthophosphate (P)	mg/L	<0.010	0.010	6041149				<0.010	0.010	6041107
pH	pH	6.14	N/A	6043248				6.04	N/A	6043248
Total Phosphorus	mg/L	<0.020	0.020	6046396				<0.020	0.020	6046396
Salinity	N/A	<2.0	2.0	6046475	<2.0	2.0	6046475	<2.0	2.0	6046475
Reactive Silica (SiO2)	mg/L	2.6	0.50	6041147				1.6	0.50	6041104
Total Suspended Solids	mg/L	<1.0	1.0	6041234				<1.0	1.0	6041234
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6041146				<2.0	2.0	6041103
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6043674				<0.0050	0.0050	6043674
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH826			JHH826			JHH827		
Sampling Date		2019/03/26 11:00			2019/03/26 11:00			2019/03/26 10:35		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch	SW2	RDL	QC Batch
Turbidity	NTU	0.24	0.10	6041058				0.63	0.10	6041058
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6049417				<0.0030	0.0030	6049417
Conductivity	uS/cm	19	1.0	6043251				22	1.0	6043251
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6058342				<0.010	0.010	6058342
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6039725				ATTACHED	N/A	6039725
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH827			JHH828			JHH828		
Sampling Date		2019/03/26 10:35			2019/03/26 09:25			2019/03/26 09:25		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW2 Lab-Dup	RDL	QC Batch	SW4	RDL	QC Batch	SW4 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L				0.210	N/A	6039016			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				5.3	1.0	6039008			
Calculated TDS	mg/L				15	1.0	6039029			
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6039008			
Cation Sum	me/L				0.220	N/A	6039016			
Hardness (CaCO3)	mg/L				5.6	1.0	6039012			
Ion Balance (% Difference)	%				2.33	N/A	6039014			
Langelier Index (@ 20C)	N/A				-3.98		6039026			
Langelier Index (@ 4C)	N/A				-4.23		6039027			
Nitrate (N)	mg/L				0.059	0.050	6039019			
Saturation pH (@ 20C)	N/A				10.3		6039026			
Saturation pH (@ 4C)	N/A				10.6		6039027			
Inorganics										
Acidity	mg/L	6.4	5.0	6046252	10	5.0	6046252			
Total Alkalinity (Total as CaCO3)	mg/L				5.3	5.0	6041142			
Total Chemical Oxygen Demand	mg/L				<20	20	6046858	<20	20	6046858
Dissolved Chloride (Cl-)	mg/L				3.5	1.0	6041145			
Colour	TCU				23	5.0	6041148			
Total Dissolved Solids	mg/L				21	10	6043931			
Dissolved Fluoride (F-)	mg/L				<0.10	0.10	6043252			
Nitrate + Nitrite (N)	mg/L				0.059	0.050	6041150			
Nitrite (N)	mg/L				<0.010	0.010	6041151			
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6041186			
Total Organic Carbon (C)	mg/L				3.7	0.50	6041507			
Orthophosphate (P)	mg/L				<0.010	0.010	6041149			
pH	pH				6.35	N/A	6043248			
Total Phosphorus	mg/L				<0.020	0.020	6046396			
Salinity	N/A				<2.0	2.0	6046475			
Reactive Silica (SiO2)	mg/L				3.0	0.50	6041147			
Total Suspended Solids	mg/L				<1.0	1.0	6041234			
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6041146			
Total Cyanide (CN)	mg/L				<0.0050	0.0050	6043687			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH827			JHH828			JHH828		
Sampling Date		2019/03/26 10:35			2019/03/26 09:25			2019/03/26 09:25		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW2 Lab-Dup	RDL	QC Batch	SW4	RDL	QC Batch	SW4 Lab-Dup	RDL	QC Batch
Turbidity	NTU				0.90	0.10	6041058			
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6049417			
Conductivity	uS/cm				26	1.0	6043251			
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6058342			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6039725			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH829			JHH829			JHH830		
Sampling Date		2019/03/26 09:00			2019/03/26 09:00			2019/03/26 12:50		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW5	RDL	QC Batch	SW5 Lab-Dup	RDL	QC Batch	SW7	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	0.100	N/A	6039016				0.0800	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008				<1.0	1.0	6039008
Calculated TDS	mg/L	9.0	1.0	6039029				9.0	1.0	6039029
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008				<1.0	1.0	6039008
Cation Sum	me/L	0.160	N/A	6039016				0.140	N/A	6039016
Hardness (CaCO3)	mg/L	2.7	1.0	6039012				2.3	1.0	6039012
Ion Balance (% Difference)	%	23.1	N/A	6039014				27.3	N/A	6039014
Langelier Index (@ 20C)	N/A	NC		6039026				NC		6039026
Langelier Index (@ 4C)	N/A	NC		6039027				NC		6039027
Nitrate (N)	mg/L	<0.050	0.050	6039019				<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A	NC		6039026				NC		6039026
Saturation pH (@ 4C)	N/A	NC		6039027				NC		6039027
Inorganics										
Acidity	mg/L	<5.0	5.0	6046252				8.0	5.0	6046252
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6043584				<5.0	5.0	6041113
Total Chemical Oxygen Demand	mg/L	<20	20	6046858				<20	20	6046858
Dissolved Chloride (Cl-)	mg/L	3.5	1.0	6043586				2.8	1.0	6041119
Colour	TCU	43	5.0	6043590				32	5.0	6041126
Total Dissolved Solids	mg/L	12	10	6043931				14	10	6043931
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043257				<0.10	0.10	6043252
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6043593				<0.050	0.050	6041132
Nitrite (N)	mg/L	<0.010	0.010	6043594				<0.010	0.010	6041135
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6041186				<0.050	0.050	6046333
Total Organic Carbon (C)	mg/L	5.3	0.50	6041507				5.0	0.50	6041507
Orthophosphate (P)	mg/L	<0.010	0.010	6043592				<0.010	0.010	6041131
pH	pH	6.51	N/A	6043255				6.07	N/A	6043248
Total Phosphorus	mg/L	<0.020	0.020	6046396	<0.020	0.020	6046396	<0.020	0.020	6046396
Salinity	N/A	<2.0	2.0	6046475				<2.0	2.0	6046475
Reactive Silica (SiO2)	mg/L	1.7	0.50	6043589				2.6	0.50	6041125
Total Suspended Solids	mg/L	1.0	1.0	6041234				<1.0	1.0	6041234
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6043587				<2.0	2.0	6041124
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6043674				<0.0050	0.0050	6043687
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH829			JHH829			JHH830		
Sampling Date		2019/03/26 09:00			2019/03/26 09:00			2019/03/26 12:50		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	SW5	RDL	QC Batch	SW5 Lab-Dup	RDL	QC Batch	SW7	RDL	QC Batch
Turbidity	NTU	0.58	0.10	6043272				0.40	0.10	6041058
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6049417				<0.0030	0.0030	6049417
Conductivity	uS/cm	20	1.0	6043256				19	1.0	6043251
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6058342				<0.010	0.010	6067418
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6039725				ATTACHED	N/A	6039725
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH830			JHH831		JHH832		
Sampling Date		2019/03/26 12:50			2019/03/26 12:30		2019/03/26 13:30		
COC Number		707748-02-01			707748-02-01		707748-02-01		
	UNITS	SW7 Lab-Dup	RDL	QC Batch	SW14	QC Batch	SW16	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L				0.120	6039016	0.100	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	6039008	<1.0	1.0	6039008
Calculated TDS	mg/L				10	6039029	9.0	1.0	6039029
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	6039008	<1.0	1.0	6039008
Cation Sum	me/L				0.190	6039016	0.160	N/A	6039016
Hardness (CaCO3)	mg/L				2.7	6039012	2.7	1.0	6039012
Ion Balance (% Difference)	%				22.6	6039014	23.1	N/A	6039014
Langelier Index (@ 20C)	N/A				NC	6039026	NC		6039026
Langelier Index (@ 4C)	N/A				NC	6039027	NC		6039027
Nitrate (N)	mg/L				<0.050	6039019	<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A				NC	6039026	NC		6039026
Saturation pH (@ 4C)	N/A				NC	6039027	NC		6039027
Inorganics									
Acidity	mg/L				<5.0	6046252	5.2	5.0	6046252
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6041113	<5.0	6041100	<5.0	5.0	6043584
Total Chemical Oxygen Demand	mg/L				20	6046858	<20	20	6046858
Dissolved Chloride (Cl-)	mg/L	3.2	1.0	6041119	4.2	6041102	3.5	1.0	6043586
Colour	TCU	32	5.0	6041126	41	6041105	40	5.0	6043590
Total Dissolved Solids	mg/L				18	6043931	<10	10	6043931
Dissolved Fluoride (F-)	mg/L				<0.10	6043252	<0.10	0.10	6043257
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6041132	<0.050	6041108	<0.050	0.050	6043593
Nitrite (N)	mg/L	<0.010	0.010	6041135	<0.010	6041109	<0.010	0.010	6043594
Nitrogen (Ammonia Nitrogen)	mg/L				0.12	6046332	<0.050	0.050	6041186
Total Organic Carbon (C)	mg/L				6.0	6041511	5.2	0.50	6041507
Orthophosphate (P)	mg/L	<0.010	0.010	6041131	<0.010	6041107	<0.010	0.010	6043592
pH	pH				5.82	6043248	5.86	N/A	6043255
Total Phosphorus	mg/L				<0.020	6046396	<0.020	0.020	6046396
Salinity	N/A				<2.0	6046475	<2.0	2.0	6046475
Reactive Silica (SiO2)	mg/L	2.4	0.50	6041125	2.1	6041104	1.7	0.50	6043589
Total Suspended Solids	mg/L				<1.0	6041234	<1.0	1.0	6041234
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6041124	<2.0	6041103	<2.0	2.0	6043587
Total Cyanide (CN)	mg/L				<0.0050	6043687	<0.0050	0.0050	6043674
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH830			JHH831		JHH832		
Sampling Date		2019/03/26 12:50			2019/03/26 12:30		2019/03/26 13:30		
COC Number		707748-02-01			707748-02-01		707748-02-01		
	UNITS	SW7 Lab-Dup	RDL	QC Batch	SW14	QC Batch	SW16	RDL	QC Batch
Turbidity	NTU	0.37	0.10	6041058	0.70	6041058	0.49	0.10	6043272
WAD Cyanide (Free)	mg/L				<0.0030	6049417	<0.0030	0.0030	6049417
Conductivity	uS/cm				22	6043251	20	1.0	6043256
RADIONUCLIDE									
Radium-226	Bq/L	<0.010	0.010	6067418	<0.010	6067418	<0.010	0.010	6067418
Subcontracted Analysis									
Subcontract Parameter	N/A				ATTACHED	6039725	ATTACHED	N/A	6039725
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH833			JHH834			JHH834		
Sampling Date		2019/03/26			2019/03/26 11:00			2019/03/26 11:00		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	DUPLICATE 1	RDL	QC Batch	SW1 FF	RDL	QC Batch	SW1 FF Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	0.0900	N/A	6039016	0.100	N/A	6039016			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008	<1.0	1.0	6039008			
Calculated TDS	mg/L	9.0	1.0	6039029	9.0	1.0	6039029			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008	<1.0	1.0	6039008			
Cation Sum	me/L	0.130	N/A	6039016	0.140	N/A	6039016			
Hardness (CaCO3)	mg/L	2.2	1.0	6039012	2.2	1.0	6039012			
Ion Balance (% Difference)	%	18.2	N/A	6039014	16.7	N/A	6039014			
Langelier Index (@ 20C)	N/A	NC		6039026	NC		6039026			
Langelier Index (@ 4C)	N/A	NC		6039027	NC		6039027			
Nitrate (N)	mg/L	<0.050	0.050	6039019	<0.050	0.050	6039019			
Saturation pH (@ 20C)	N/A	NC		6039026	NC		6039026			
Saturation pH (@ 4C)	N/A	NC		6039027	NC		6039027			
Inorganics										
Acidity	mg/L	11	5.0	6046252						
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6043584	<5.0	5.0	6041142			
Total Chemical Oxygen Demand	mg/L	20	20	6046858						
Dissolved Chloride (Cl-)	mg/L	3.2	1.0	6043586	3.4	1.0	6041145			
Colour	TCU	49	5.0	6043590	47	5.0	6041148			
Total Dissolved Solids	mg/L	16	10	6043931						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043257						
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6043593	<0.050	0.050	6041150			
Nitrite (N)	mg/L	<0.010	0.010	6043594	<0.010	0.010	6041151			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046332	<0.050	0.050	6041186			
Dissolved Organic Carbon (C)	mg/L				5.0	0.5	6039462	5.0	0.5	6039462
Total Organic Carbon (C)	mg/L	5.2	0.50	6041511	5.1	0.50	6041507			
Orthophosphate (P)	mg/L	<0.010	0.010	6043592	<0.010	0.010	6041149			
pH	pH	5.88	N/A	6043255	5.69	N/A	6041022			
Total Phosphorus	mg/L	<0.020	0.020	6046396						
Salinity	N/A	<2.0	2.0	6046475						
Reactive Silica (SiO2)	mg/L	2.5	0.50	6043589	2.3	0.50	6041147			
Total Suspended Solids	mg/L	<1.0	1.0	6041234						
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6043587	<2.0	2.0	6041146			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH833			JHH834			JHH834		
Sampling Date		2019/03/26			2019/03/26 11:00			2019/03/26 11:00		
COC Number		707748-02-01			707748-02-01			707748-02-01		
	UNITS	DUPLICATE 1	RDL	QC Batch	SW1 FF	RDL	QC Batch	SW1 FF Lab-Dup	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6043674						
Turbidity	NTU	0.29	0.10	6043272	<0.10	0.10	6041058			
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6049417						
Conductivity	uS/cm	19	1.0	6043256	19	1.0	6041024			
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6067418						
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6039725						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH835		JHH836			JHH836		
Sampling Date		2019/03/26 10:35		2019/03/26 09:25			2019/03/26 09:25		
COC Number		707748-02-01		707748-02-01			707748-02-01		
	UNITS	SW2 FF	QC Batch	SW4 FF	RDL	QC Batch	SW4 FF Lab-Dup	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	0.110	6039016	0.100	N/A	6039016			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	6039008	<1.0	1.0	6039008			
Calculated TDS	mg/L	10	6039029	11	1.0	6039029			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	6039008	<1.0	1.0	6039008			
Cation Sum	me/L	0.170	6039016	0.210	N/A	6039016			
Hardness (CaCO3)	mg/L	2.7	6039012	5.2	1.0	6039012			
Ion Balance (% Difference)	%	21.4	6039014	35.5	N/A	6039014			
Langelier Index (@ 20C)	N/A	NC	6039026	NC		6039026			
Langelier Index (@ 4C)	N/A	NC	6039027	NC		6039027			
Nitrate (N)	mg/L	<0.050	6039019	0.060	0.050	6039019			
Saturation pH (@ 20C)	N/A	NC	6039026	NC		6039026			
Saturation pH (@ 4C)	N/A	NC	6039027	NC		6039027			
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	6041142	<5.0	5.0	6043584			
Dissolved Chloride (Cl-)	mg/L	3.9	6041145	3.3	1.0	6043586			
Colour	TCU	37	6041148	26	5.0	6043590			
Nitrate + Nitrite (N)	mg/L	<0.050	6041150	0.060	0.050	6043593			
Nitrite (N)	mg/L	<0.010	6041151	<0.010	0.010	6043594			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	6041186	<0.050	0.050	6041186			
Dissolved Organic Carbon (C)	mg/L	5.5	6039462	3.8	0.5	6039462			
Total Organic Carbon (C)	mg/L	5.3	6041507	3.6	0.50	6041507	3.7	0.50	6041507
Orthophosphate (P)	mg/L	<0.010	6041149	<0.010	0.010	6043592			
pH	pH	6.12	6041022	6.47	N/A	6043255			
Reactive Silica (SiO2)	mg/L	2.0	6041147	2.5	0.50	6043589			
Dissolved Sulphate (SO4)	mg/L	<2.0	6041146	<2.0	2.0	6043587			
Turbidity	NTU	<0.10	6041058	0.11	0.10	6043272			
Conductivity	uS/cm	21	6041024	28	1.0	6043256			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH837		JHH838		JHH839		
Sampling Date		2019/03/26 09:00		2019/03/26 12:50		2019/03/26 12:30		
COC Number		707748-02-01		707748-02-01		707748-02-01		
	UNITS	SW5 FF	QC Batch	SW7 FF	QC Batch	SW14 FF	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	0.120	6039016	0.100	6039016	0.120	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	6039008	<1.0	6039008	<1.0	1.0	6039008
Calculated TDS	mg/L	9.0	6039029	9.0	6039029	11	1.0	6039029
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	6039008	<1.0	6039008	<1.0	1.0	6039008
Cation Sum	me/L	0.160	6039016	0.150	6039016	0.180	N/A	6039016
Hardness (CaCO ₃)	mg/L	2.6	6039012	2.3	6039012	2.7	1.0	6039012
Ion Balance (% Difference)	%	14.3	6039014	20.0	6039014	20.0	N/A	6039014
Langelier Index (@ 20C)	N/A	NC	6039026	NC	6039026	NC		6039026
Langelier Index (@ 4C)	N/A	NC	6039027	NC	6039027	NC		6039027
Nitrate (N)	mg/L	<0.050	6039019	<0.050	6039019	<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A	NC	6039026	NC	6039026	NC		6039026
Saturation pH (@ 4C)	N/A	NC	6039027	NC	6039027	NC		6039027
Inorganics								
Total Alkalinity (Total as CaCO ₃)	mg/L	<5.0	6041142	<5.0	6041142	<5.0	5.0	6041142
Dissolved Chloride (Cl ⁻)	mg/L	4.1	6041145	3.5	6041145	4.2	1.0	6041145
Colour	TCU	41	6041148	32	6041148	40	5.0	6041148
Nitrate + Nitrite (N)	mg/L	<0.050	6041150	<0.050	6041150	<0.050	0.050	6041150
Nitrite (N)	mg/L	<0.010	6041151	<0.010	6041151	<0.010	0.010	6041151
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	6041186	<0.050	6046332	<0.050	0.050	6046332
Dissolved Organic Carbon (C)	mg/L	5.4	6039462	5.0	6039462	5.5	0.5	6039462
Total Organic Carbon (C)	mg/L	5.2	6041507	4.8	6041511	5.3	0.50	6041511
Orthophosphate (P)	mg/L	<0.010	6041149	<0.010	6041149	<0.010	0.010	6041149
pH	pH	5.59	6041022	5.59	6041022	5.96	N/A	6043258
Reactive Silica (SiO ₂)	mg/L	1.8	6041147	2.3	6041147	2.4	0.50	6041147
Dissolved Sulphate (SO ₄)	mg/L	<2.0	6041146	<2.0	6041146	<2.0	2.0	6041146
Turbidity	NTU	0.19	6041058	<0.10	6041058	0.15	0.10	6043276
Conductivity	uS/cm	20	6041024	19	6041024	23	1.0	6043260
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH839			JHH840		JHH841		
Sampling Date		2019/03/26 12:30			2019/03/26 13:30		2019/03/26		
COC Number		707748-02-01			707748-02-01		707748-02-01		
	UNITS	SW14 FF Lab-Dup	RDL	QC Batch	SW16 FF	QC Batch	DUPLICATE 1 FF	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L				0.120	6039016	0.0900	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	6039008	<1.0	1.0	6039008
Calculated TDS	mg/L				9.0	6039029	9.0	1.0	6039029
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	6039008	<1.0	1.0	6039008
Cation Sum	me/L				0.160	6039016	0.140	N/A	6039016
Hardness (CaCO3)	mg/L				2.6	6039012	2.2	1.0	6039012
Ion Balance (% Difference)	%				14.3	6039014	21.7	N/A	6039014
Langelier Index (@ 20C)	N/A				NC	6039026	NC		6039026
Langelier Index (@ 4C)	N/A				NC	6039027	NC		6039027
Nitrate (N)	mg/L				<0.050	6039019	<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A				NC	6039026	NC		6039026
Saturation pH (@ 4C)	N/A				NC	6039027	NC		6039027
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6041142	<5.0	6041142	<5.0	5.0	6043584
Dissolved Chloride (Cl-)	mg/L	4.0	1.0	6041145	4.1	6041145	3.3	1.0	6043586
Colour	TCU	40	5.0	6041148	39	6041148	50	5.0	6043590
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6041150	<0.050	6041150	<0.050	0.050	6043593
Nitrite (N)	mg/L	<0.010	0.010	6041151	<0.010	6041151	<0.010	0.010	6043594
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	6041186	<0.050	0.050	6046332
Dissolved Organic Carbon (C)	mg/L				5.3	6039462	5.1	0.5	6039462
Total Organic Carbon (C)	mg/L				5.3	6041511	4.9	0.50	6041511
Orthophosphate (P)	mg/L	<0.010	0.010	6041149	<0.010	6041149	0.023	0.010	6043592
pH	pH				5.57	6041022	5.80	N/A	6043258
Reactive Silica (SiO2)	mg/L	2.2	0.50	6041147	1.8	6041147	2.2	0.50	6043589
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6041146	<2.0	6041146	<2.0	2.0	6043587
Turbidity	NTU	0.15	0.10	6043276	<0.10	6041058	<0.10	0.10	6043274
Conductivity	uS/cm				20	6041024	19	1.0	6043260
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH842			JHH843		
Sampling Date		2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.0100	N/A	6039016	0.00	N/A	6039016
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008	<1.0	1.0	6039008
Calculated TDS	mg/L	<1.0	1.0	6039029	<1.0	1.0	6039029
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6039008	<1.0	1.0	6039008
Cation Sum	me/L	0.00	N/A	6039016	0.0100	N/A	6039016
Hardness (CaCO3)	mg/L	<1.0	1.0	6039012	<1.0	1.0	6039012
Ion Balance (% Difference)	%	100	N/A	6039014	100	N/A	6039014
Langelier Index (@ 20C)	N/A	NC		6039026	NC		6039026
Langelier Index (@ 4C)	N/A	NC		6039027	NC		6039027
Nitrate (N)	mg/L	0.088	0.050	6039019	<0.050	0.050	6039019
Saturation pH (@ 20C)	N/A	NC		6039026	NC		6039026
Saturation pH (@ 4C)	N/A	NC		6039027	NC		6039027
Inorganics							
Acidity	mg/L	<5.0	5.0	6046252			
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6041100	<5.0	5.0	6043584
Total Chemical Oxygen Demand	mg/L	<20	20	6046858			
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	6041102	<1.0	1.0	6043586
Colour	TCU	<5.0	5.0	6041105	<5.0	5.0	6043590
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043252			
Nitrate + Nitrite (N)	mg/L	0.088	0.050	6041108	<0.050	0.050	6043593
Nitrite (N)	mg/L	<0.010	0.010	6041109	<0.010	0.010	6043594
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046332	<0.050	0.050	6046332
Dissolved Organic Carbon (C)	mg/L				<0.5	0.5	6039462
Total Organic Carbon (C)	mg/L	<0.50	0.50	6041511	<0.50	0.50	6041511
Orthophosphate (P)	mg/L	<0.010	0.010	6041107	<0.010	0.010	6043592
pH	pH	5.94	N/A	6043248	6.21	N/A	6043255
Total Phosphorus	mg/L	<0.020	0.020	6046396			
Salinity	N/A	<2.0	2.0	6046475			
Reactive Silica (SiO2)	mg/L	<0.50	0.50	6041104	<0.50	0.50	6043589
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6041103	<2.0	2.0	6043587
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6043687			
Turbidity	NTU	<0.10	0.10	6043272	<0.10	0.10	6043274
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6049417			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH842			JHH843		
Sampling Date		2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Conductivity	uS/cm	1.0	1.0	6043251	1.4	1.0	6043256
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHH844			JHH844	
Sampling Date		2019/03/26			2019/03/26	
COC Number		707748-02-01			707748-02-01	
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	QC Batch
Calculated Parameters						
Anion Sum	me/L	0.00	N/A	6039016		
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6039008		
Calculated TDS	mg/L	<1.0	1.0	6039029		
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	1.0	6039008		
Cation Sum	me/L	0.00	N/A	6039016		
Hardness (CaCO ₃)	mg/L	<1.0	1.0	6039012		
Langelier Index (@ 20C)	N/A	NC		6039026		
Langelier Index (@ 4C)	N/A	NC		6039027		
Nitrate (N)	mg/L	<0.050	0.050	6039019		
Saturation pH (@ 20C)	N/A	NC		6039026		
Saturation pH (@ 4C)	N/A	NC		6039027		
Inorganics						
Acidity	mg/L	<5.0	5.0	6046252		
Total Alkalinity (Total as CaCO ₃)	mg/L	<5.0	5.0	6043584		
Total Chemical Oxygen Demand	mg/L	<20	20	6046858		
Dissolved Chloride (Cl ⁻)	mg/L	<1.0	1.0	6043586		
Colour	TCU	<5.0	5.0	6043590		
Total Dissolved Solids	mg/L	<10	10	6043931		
Dissolved Fluoride (F ⁻)	mg/L	<0.10	0.10	6043257		
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6043593		
Nitrite (N)	mg/L	<0.010	0.010	6043594		
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6041186		
Total Organic Carbon (C)	mg/L	<0.50	0.50	6041507		
Orthophosphate (P)	mg/L	<0.010	0.010	6043592		
pH	pH	5.60	N/A	6044028	5.66	6044028
Total Phosphorus	mg/L	<0.020	0.020	6046396		
Salinity	N/A	<2.0	2.0	6046475		
Reactive Silica (SiO ₂)	mg/L	<0.50	0.50	6043589		
Total Suspended Solids	mg/L	<1.0	1.0	6041234		
Dissolved Sulphate (SO ₄)	mg/L	<2.0	2.0	6043587		
Turbidity	NTU	<0.10	0.10	6043274		
Conductivity	uS/cm	4.4	1.0	6043256		
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable						

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		JHH826	JHH827	JHH828	JHH829	JHH830	JHH831		
Sampling Date		2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25	2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW1	SW2	SW4	SW5	SW7	SW14	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	6046692
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam ID		JHH832	JHH833			JHH834	JHH835	JHH836		
Sampling Date		2019/03/26 13:30	2019/03/26			2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25		
COC Number		707748-02-01	707748-02-01			707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW16	DUPLICATE 1	RDL	QC Batch	SW1 FF	SW2 FF	SW4 FF	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L					<0.013	<0.013	0.013	0.013	6039106
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6046692					
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

Maxxam ID		JHH837	JHH838	JHH839	JHH840	JHH841		
Sampling Date		2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30	2019/03/26 13:30	2019/03/26		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW5 FF	SW7 FF	SW14 FF	SW16 FF	DUPLICATE 1 FF	RDL	QC Batch

Metals								
Dissolved Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	6039106
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		JHH842	JHH842			JHH843		
Sampling Date		2019/03/26 11:45	2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01	707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	FIELD/FILTER BLANK Lab-Dup	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Metals								
Dissolved Mercury (Hg)	ug/L					<0.013	0.013	6039106
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6046692			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate								

Maxxam ID		JHH844		
Sampling Date		2019/03/26		
COC Number		707748-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Metals				
Total Mercury (Hg)	ug/L	<0.013	0.013	6046692
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH826	JHH827	JHH828	JHH829	JHH830	JHH831		
Sampling Date		2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25	2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW1	SW2	SW4	SW5	SW7	SW14	RDL	QC Batch
Metals									
Total Aluminum (Al)	ug/L	130	160	130	150	110	180	5.0	6041292
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041292
Total Arsenic (As)	ug/L	<1.0	<1.0	27	3.7	1.2	1.0	1.0	6041292
Total Barium (Ba)	ug/L	2.3	3.8	2.5	2.9	2.2	4.5	1.0	6041292
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041292
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Boron (B)	ug/L	<50	<50	<50	<50	<50	<50	50	6041292
Total Cadmium (Cd)	ug/L	0.019	0.019	0.017	0.010	0.011	0.023	0.010	6041292
Total Calcium (Ca)	ug/L	470	520	1700	560	520	580	100	6041292
Total Chromium (Cr)	ug/L	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	1.0	6041292
Total Cobalt (Co)	ug/L	<0.40	<0.40	0.46	<0.40	<0.40	<0.40	0.40	6041292
Total Copper (Cu)	ug/L	8.5	<0.50	3.9	<0.50	<0.50	<0.50	0.50	6041292
Total Iron (Fe)	ug/L	100	150	360	170	170	150	50	6041292
Total Lead (Pb)	ug/L	0.65	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6041292
Total Magnesium (Mg)	ug/L	240	320	320	310	240	300	100	6041292
Total Manganese (Mn)	ug/L	32	51	140	58	130	69	2.0	6041292
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	<100	100	6041292
Total Potassium (K)	ug/L	280	250	290	290	260	280	100	6041292
Total Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041292
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041292
Total Sodium (Na)	ug/L	1800	2300	2100	2100	1900	2600	100	6041292
Total Strontium (Sr)	ug/L	4.6	5.6	6.4	5.0	2.8	4.8	2.0	6041292
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041292
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041292
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Zirconium (Zr)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041292
Total Zinc (Zn)	ug/L	7.1	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6041292
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH832	JHH833			JHH834	JHH835	JHH836		
Sampling Date		2019/03/26 13:30	2019/03/26			2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25		
COC Number		707748-02-01	707748-02-01			707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW16	DUPLICATE 1	RDL	QC Batch	SW1 FF	SW2 FF	SW4 FF	RDL	QC Batch

Metals										
Dissolved Aluminum (Al)	ug/L					130	140	110	5.0	6041328
Total Aluminum (Al)	ug/L	160	140	5.0	6041292					
Dissolved Antimony (Sb)	ug/L					<1.0	<1.0	<1.0	1.0	6041328
Total Antimony (Sb)	ug/L	<1.0	<1.0	1.0	6041292					
Dissolved Arsenic (As)	ug/L					<1.0	<1.0	18	1.0	6041328
Total Arsenic (As)	ug/L	2.4	<1.0	1.0	6041292					
Dissolved Barium (Ba)	ug/L					2.5	3.5	2.2	1.0	6041328
Total Barium (Ba)	ug/L	2.9	2.4	1.0	6041292					
Dissolved Beryllium (Be)	ug/L					<1.0	<1.0	<1.0	1.0	6041328
Total Beryllium (Be)	ug/L	<1.0	<1.0	1.0	6041292					
Dissolved Bismuth (Bi)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Boron (B)	ug/L					<50	<50	<50	50	6041328
Total Boron (B)	ug/L	<50	<50	50	6041292					
Dissolved Cadmium (Cd)	ug/L					<0.010	0.018	0.016	0.010	6041328
Total Cadmium (Cd)	ug/L	0.012	<0.010	0.010	6041292					
Dissolved Calcium (Ca)	ug/L					510	540	1600	100	6041328
Total Calcium (Ca)	ug/L	560	480	100	6041292					
Dissolved Chromium (Cr)	ug/L					1.0	<1.0	<1.0	1.0	6041328
Total Chromium (Cr)	ug/L	<1.0	<1.0	1.0	6041292					
Dissolved Cobalt (Co)	ug/L					<0.40	<0.40	<0.40	0.40	6041328
Total Cobalt (Co)	ug/L	<0.40	<0.40	0.40	6041292					
Dissolved Copper (Cu)	ug/L					<0.50	<0.50	0.63	0.50	6041328
Total Copper (Cu)	ug/L	<0.50	<0.50	0.50	6041292					
Dissolved Iron (Fe)	ug/L					94	110	240	50	6041328
Total Iron (Fe)	ug/L	150	100	50	6041292					
Dissolved Lead (Pb)	ug/L					<0.50	<0.50	<0.50	0.50	6041328
Total Lead (Pb)	ug/L	<0.50	<0.50	0.50	6041292					
Dissolved Magnesium (Mg)	ug/L					230	320	330	100	6041328
Total Magnesium (Mg)	ug/L	300	230	100	6041292					
Dissolved Manganese (Mn)	ug/L					28	50	110	2.0	6041328
Total Manganese (Mn)	ug/L	58	28	2.0	6041292					
Dissolved Molybdenum (Mo)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	6041292					

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH832	JHH833			JHH834	JHH835	JHH836		
Sampling Date		2019/03/26 13:30	2019/03/26			2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25		
COC Number		707748-02-01	707748-02-01			707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW16	DUPLICATE 1	RDL	QC Batch	SW1 FF	SW2 FF	SW4 FF	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Nickel (Ni)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Phosphorus (P)	ug/L					<100	<100	<100	100	6041328
Total Phosphorus (P)	ug/L	<100	<100	100	6041292					
Dissolved Potassium (K)	ug/L					270	240	290	100	6041328
Total Potassium (K)	ug/L	270	260	100	6041292					
Dissolved Selenium (Se)	ug/L					<1.0	<1.0	<1.0	1.0	6041328
Total Selenium (Se)	ug/L	<1.0	<1.0	1.0	6041292					
Dissolved Silver (Ag)	ug/L					<0.10	<0.10	<0.10	0.10	6041328
Total Silver (Ag)	ug/L	<0.10	<0.10	0.10	6041292					
Dissolved Sodium (Na)	ug/L					1900	2300	2200	100	6041328
Total Sodium (Na)	ug/L	2200	1800	100	6041292					
Dissolved Strontium (Sr)	ug/L					4.6	5.9	5.7	2.0	6041328
Total Strontium (Sr)	ug/L	4.7	4.3	2.0	6041292					
Dissolved Thallium (Tl)	ug/L					<0.10	<0.10	<0.10	0.10	6041328
Total Thallium (Tl)	ug/L	<0.10	<0.10	0.10	6041292					
Dissolved Tin (Sn)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Tin (Sn)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Titanium (Ti)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Titanium (Ti)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Uranium (U)	ug/L					<0.10	<0.10	<0.10	0.10	6041328
Total Uranium (U)	ug/L	<0.10	<0.10	0.10	6041292					
Dissolved Vanadium (V)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Vanadium (V)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Zirconium (Zr)	ug/L					<2.0	<2.0	<2.0	2.0	6041328
Total Zirconium (Zr)	ug/L	<2.0	<2.0	2.0	6041292					
Dissolved Zinc (Zn)	ug/L					<5.0	<5.0	<5.0	5.0	6041328
Total Zinc (Zn)	ug/L	<5.0	<5.0	5.0	6041292					
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH837	JHH838	JHH839	JHH840	JHH841		
Sampling Date		2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30	2019/03/26 13:30	2019/03/26		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW5 FF	SW7 FF	SW14 FF	SW16 FF	DUPLICATE 1 FF	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	130	93	160	130	130	5.0	6041328
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041328
Dissolved Arsenic (As)	ug/L	3.0	<1.0	<1.0	1.9	<1.0	1.0	6041328
Dissolved Barium (Ba)	ug/L	2.7	2.1	4.4	2.7	2.4	1.0	6041328
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041328
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Boron (B)	ug/L	<50	<50	<50	<50	<50	50	6041328
Dissolved Cadmium (Cd)	ug/L	0.011	<0.010	0.019	0.011	0.012	0.010	6041328
Dissolved Calcium (Ca)	ug/L	580	530	580	570	490	100	6041328
Dissolved Chromium (Cr)	ug/L	1.0	1.1	1.1	1.2	<1.0	1.0	6041328
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6041328
Dissolved Copper (Cu)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6041328
Dissolved Iron (Fe)	ug/L	130	130	120	120	94	50	6041328
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6041328
Dissolved Magnesium (Mg)	ug/L	290	240	300	290	230	100	6041328
Dissolved Manganese (Mn)	ug/L	57	120	72	56	30	2.0	6041328
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	100	6041328
Dissolved Potassium (K)	ug/L	280	280	270	280	270	100	6041328
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041328
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041328
Dissolved Sodium (Na)	ug/L	2200	2000	2600	2200	1800	100	6041328
Dissolved Strontium (Sr)	ug/L	4.8	3.0	4.6	5.2	4.7	2.0	6041328
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041328
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Uranium (U)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6041328
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Zirconium (Zr)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6041328
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6041328
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH842			JHH843		
Sampling Date		2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L				<5.0	5.0	6041328
Total Aluminum (Al)	ug/L	<5.0	5.0	6041292			
Dissolved Antimony (Sb)	ug/L				<1.0	1.0	6041328
Total Antimony (Sb)	ug/L	<1.0	1.0	6041292			
Dissolved Arsenic (As)	ug/L				<1.0	1.0	6041328
Total Arsenic (As)	ug/L	<1.0	1.0	6041292			
Dissolved Barium (Ba)	ug/L				<1.0	1.0	6041328
Total Barium (Ba)	ug/L	<1.0	1.0	6041292			
Dissolved Beryllium (Be)	ug/L				<1.0	1.0	6041328
Total Beryllium (Be)	ug/L	<1.0	1.0	6041292			
Dissolved Bismuth (Bi)	ug/L				<2.0	2.0	6041328
Total Bismuth (Bi)	ug/L	<2.0	2.0	6041292			
Dissolved Boron (B)	ug/L				<50	50	6041328
Total Boron (B)	ug/L	<50	50	6041292			
Dissolved Cadmium (Cd)	ug/L				<0.010	0.010	6041328
Total Cadmium (Cd)	ug/L	<0.010	0.010	6041292			
Dissolved Calcium (Ca)	ug/L				<100	100	6041328
Total Calcium (Ca)	ug/L	<100	100	6041292			
Dissolved Chromium (Cr)	ug/L				<1.0	1.0	6041328
Total Chromium (Cr)	ug/L	<1.0	1.0	6041292			
Dissolved Cobalt (Co)	ug/L				<0.40	0.40	6041328
Total Cobalt (Co)	ug/L	<0.40	0.40	6041292			
Dissolved Copper (Cu)	ug/L				<0.50	0.50	6041328
Total Copper (Cu)	ug/L	<0.50	0.50	6041292			
Dissolved Iron (Fe)	ug/L				<50	50	6041328
Total Iron (Fe)	ug/L	<50	50	6041292			
Dissolved Lead (Pb)	ug/L				<0.50	0.50	6041328
Total Lead (Pb)	ug/L	<0.50	0.50	6041292			
Dissolved Magnesium (Mg)	ug/L				<100	100	6041328
Total Magnesium (Mg)	ug/L	<100	100	6041292			
Dissolved Manganese (Mn)	ug/L				<2.0	2.0	6041328
Total Manganese (Mn)	ug/L	<2.0	2.0	6041292			
Dissolved Molybdenum (Mo)	ug/L				<2.0	2.0	6041328
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6041292			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH842			JHH843		
Sampling Date		2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L				<2.0	2.0	6041328
Total Nickel (Ni)	ug/L	<2.0	2.0	6041292			
Dissolved Phosphorus (P)	ug/L				<100	100	6041328
Total Phosphorus (P)	ug/L	<100	100	6041292			
Dissolved Potassium (K)	ug/L				<100	100	6041328
Total Potassium (K)	ug/L	<100	100	6041292			
Dissolved Selenium (Se)	ug/L				<1.0	1.0	6041328
Total Selenium (Se)	ug/L	<1.0	1.0	6041292			
Dissolved Silver (Ag)	ug/L				<0.10	0.10	6041328
Total Silver (Ag)	ug/L	<0.10	0.10	6041292			
Dissolved Sodium (Na)	ug/L				260	100	6041328
Total Sodium (Na)	ug/L	<100	100	6041292			
Dissolved Strontium (Sr)	ug/L				<2.0	2.0	6041328
Total Strontium (Sr)	ug/L	<2.0	2.0	6041292			
Dissolved Thallium (Tl)	ug/L				<0.10	0.10	6041328
Total Thallium (Tl)	ug/L	<0.10	0.10	6041292			
Dissolved Tin (Sn)	ug/L				<2.0	2.0	6041328
Total Tin (Sn)	ug/L	<2.0	2.0	6041292			
Dissolved Titanium (Ti)	ug/L				<2.0	2.0	6041328
Total Titanium (Ti)	ug/L	<2.0	2.0	6041292			
Dissolved Uranium (U)	ug/L				<0.10	0.10	6041328
Total Uranium (U)	ug/L	<0.10	0.10	6041292			
Dissolved Vanadium (V)	ug/L				<2.0	2.0	6041328
Total Vanadium (V)	ug/L	<2.0	2.0	6041292			
Dissolved Zirconium (Zr)	ug/L				<2.0	2.0	6041328
Total Zirconium (Zr)	ug/L	<2.0	2.0	6041292			
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	6041328
Total Zinc (Zn)	ug/L	<5.0	5.0	6041292			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHH844		
Sampling Date		2019/03/26		
COC Number		707748-02-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	43	5.0	6041292
Total Antimony (Sb)	ug/L	<1.0	1.0	6041292
Total Arsenic (As)	ug/L	<1.0	1.0	6041292
Total Barium (Ba)	ug/L	<1.0	1.0	6041292
Total Beryllium (Be)	ug/L	<1.0	1.0	6041292
Total Bismuth (Bi)	ug/L	<2.0	2.0	6041292
Total Boron (B)	ug/L	<50	50	6041292
Total Cadmium (Cd)	ug/L	<0.010	0.010	6041292
Total Calcium (Ca)	ug/L	<100	100	6041292
Total Chromium (Cr)	ug/L	<1.0	1.0	6041292
Total Cobalt (Co)	ug/L	<0.40	0.40	6041292
Total Copper (Cu)	ug/L	1.6	0.50	6041292
Total Iron (Fe)	ug/L	<50	50	6041292
Total Lead (Pb)	ug/L	<0.50	0.50	6041292
Total Magnesium (Mg)	ug/L	<100	100	6041292
Total Manganese (Mn)	ug/L	<2.0	2.0	6041292
Total Molybdenum (Mo)	ug/L	<2.0	2.0	6041292
Total Nickel (Ni)	ug/L	<2.0	2.0	6041292
Total Phosphorus (P)	ug/L	<100	100	6041292
Total Potassium (K)	ug/L	<100	100	6041292
Total Selenium (Se)	ug/L	<1.0	1.0	6041292
Total Silver (Ag)	ug/L	<0.10	0.10	6041292
Total Sodium (Na)	ug/L	<100	100	6041292
Total Strontium (Sr)	ug/L	<2.0	2.0	6041292
Total Thallium (Tl)	ug/L	<0.10	0.10	6041292
Total Tin (Sn)	ug/L	<2.0	2.0	6041292
Total Titanium (Ti)	ug/L	<2.0	2.0	6041292
Total Uranium (U)	ug/L	<0.10	0.10	6041292
Total Vanadium (V)	ug/L	<2.0	2.0	6041292
Total Zirconium (Zr)	ug/L	<2.0	2.0	6041292
Total Zinc (Zn)	ug/L	<5.0	5.0	6041292
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JHH826	JHH827	JHH828	JHH829	JHH830	JHH831		
Sampling Date		2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25	2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW1	SW2	SW4	SW5	SW7	SW14	RDL	QC Batch

Metals									
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6045757
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam ID		JHH832	JHH833			JHH834	JHH835	JHH836		
Sampling Date		2019/03/26 13:30	2019/03/26			2019/03/26 11:00	2019/03/26 10:35	2019/03/26 09:25		
COC Number		707748-02-01	707748-02-01			707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW16	DUPLICATE 1	RDL	QC Batch	SW1 FF	SW2 FF	SW4 FF	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L					<1.0	<1.0	<1.0	1.0	6041945
Total Tungsten (W)	ug/L	<1.0	<1.0	1.0	6045757					
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

Maxxam ID		JHH837	JHH838	JHH839	JHH840	JHH841		
Sampling Date		2019/03/26 09:00	2019/03/26 12:50	2019/03/26 12:30	2019/03/26 13:30	2019/03/26		
COC Number		707748-02-01	707748-02-01	707748-02-01	707748-02-01	707748-02-01		
	UNITS	SW5 FF	SW7 FF	SW14 FF	SW16 FF	DUPLICATE 1 FF	RDL	QC Batch

Metals								
Dissolved Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6041945
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JHH842			JHH843		
Sampling Date		2019/03/26 11:45			2019/03/26 11:45		
COC Number		707748-02-01			707748-02-01		
	UNITS	FIELD/FILTER BLANK	RDL	QC Batch	FIELD/FILTER BLANK FF	RDL	QC Batch
Metals							
Dissolved Tungsten (W)	ug/L				<1.0	1.0	6041945
Total Tungsten (W)	ug/L	<1.0	1.0	6046649			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.0°C
Package 2	2.7°C
Package 3	2.7°C
Package 4	1.0°C
Package 5	1.7°C

Sample JHH826 [SW1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH827 [SW2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH829 [SW5] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH830 [SW7] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH831 [SW14] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH832 [SW16] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH833 [DUPLICATE 1] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH834 [SW1 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH835 [SW2 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH836 [SW4 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH837 [SW5 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH838 [SW7 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH839 [SW14 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH840 [SW16 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH841 [DUPLICATE 1 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH842 [FIELD/FILTER BLANK] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHH843 [FIELD/FILTER BLANK FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6039106	AYN	Matrix Spike	Dissolved Mercury (Hg)	2019/03/28		103	%	80 - 120
6039106	AYN	Spiked Blank	Dissolved Mercury (Hg)	2019/03/28		103	%	80 - 120
6039106	AYN	Method Blank	Dissolved Mercury (Hg)	2019/03/28	<0.013		ug/L	
6039106	AYN	RPD	Dissolved Mercury (Hg)	2019/03/28	NC		%	20
6039462	HM2	Matrix Spike [JHH834-05]	Dissolved Organic Carbon (C)	2019/03/27		100	%	85 - 115
6039462	HM2	Spiked Blank	Dissolved Organic Carbon (C)	2019/03/27		99	%	80 - 120
6039462	HM2	Method Blank	Dissolved Organic Carbon (C)	2019/03/27	<0.5		mg/L	
6039462	HM2	RPD [JHH834-05]	Dissolved Organic Carbon (C)	2019/03/27	0.74		%	15
6041022	NHU	QC Standard	pH	2019/03/28		101	%	97 - 103
6041022	NHU	RPD	pH	2019/03/28	1.6		%	N/A
6041024	NHU	Spiked Blank	Conductivity	2019/03/28		103	%	80 - 120
6041024	NHU	Method Blank	Conductivity	2019/03/28	1.6, RDL=1.0		uS/cm	
6041024	NHU	RPD	Conductivity	2019/03/28	0.82		%	10
6041058	NHU	QC Standard	Turbidity	2019/03/28		105	%	80 - 120
6041058	NHU	Spiked Blank	Turbidity	2019/03/28		100	%	80 - 120
6041058	NHU	Method Blank	Turbidity	2019/03/28	<0.10		NTU	
6041058	NHU	RPD [JHH830-04]	Turbidity	2019/03/28	7.8		%	20
6041100	SRM	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/03/28		NC	%	80 - 120
6041100	SRM	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/28		105	%	80 - 120
6041100	SRM	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/28	<5.0		mg/L	
6041100	SRM	RPD	Total Alkalinity (Total as CaCO3)	2019/03/28	0.94		%	25
6041102	SRM	Matrix Spike	Dissolved Chloride (Cl-)	2019/03/28		99	%	80 - 120
6041102	SRM	QC Standard	Dissolved Chloride (Cl-)	2019/03/28		104	%	80 - 120
6041102	SRM	Spiked Blank	Dissolved Chloride (Cl-)	2019/03/28		99	%	80 - 120
6041102	SRM	Method Blank	Dissolved Chloride (Cl-)	2019/03/28	<1.0		mg/L	
6041102	SRM	RPD	Dissolved Chloride (Cl-)	2019/03/28	1.0		%	25
6041103	SRM	Matrix Spike	Dissolved Sulphate (SO4)	2019/03/28		96	%	80 - 120
6041103	SRM	Spiked Blank	Dissolved Sulphate (SO4)	2019/03/28		98	%	80 - 120
6041103	SRM	Method Blank	Dissolved Sulphate (SO4)	2019/03/28	<2.0		mg/L	
6041103	SRM	RPD	Dissolved Sulphate (SO4)	2019/03/28	1.4		%	25
6041104	SRM	Matrix Spike	Reactive Silica (SiO2)	2019/03/29		NC	%	80 - 120
6041104	SRM	Spiked Blank	Reactive Silica (SiO2)	2019/03/28		99	%	80 - 120
6041104	SRM	Method Blank	Reactive Silica (SiO2)	2019/03/28	<0.50		mg/L	
6041104	SRM	RPD	Reactive Silica (SiO2)	2019/03/29	9.3		%	25
6041105	SRM	Spiked Blank	Colour	2019/03/28		91	%	80 - 120
6041105	SRM	Method Blank	Colour	2019/03/28	<5.0		TCU	
6041105	SRM	RPD	Colour	2019/03/28	NC		%	20
6041107	SRM	Matrix Spike	Orthophosphate (P)	2019/03/28		95	%	80 - 120
6041107	SRM	Spiked Blank	Orthophosphate (P)	2019/03/28		99	%	80 - 120
6041107	SRM	Method Blank	Orthophosphate (P)	2019/03/28	<0.010		mg/L	
6041107	SRM	RPD	Orthophosphate (P)	2019/03/28	3.0		%	25
6041108	SRM	Matrix Spike	Nitrate + Nitrite (N)	2019/03/28		95	%	80 - 120
6041108	SRM	Spiked Blank	Nitrate + Nitrite (N)	2019/03/28		97	%	80 - 120
6041108	SRM	Method Blank	Nitrate + Nitrite (N)	2019/03/28	<0.050		mg/L	
6041108	SRM	RPD	Nitrate + Nitrite (N)	2019/03/28	4.0		%	25
6041109	SRM	Matrix Spike	Nitrite (N)	2019/03/28		56 (1)	%	80 - 120
6041109	SRM	Spiked Blank	Nitrite (N)	2019/03/28		96	%	80 - 120
6041109	SRM	Method Blank	Nitrite (N)	2019/03/28	<0.010		mg/L	
6041109	SRM	RPD	Nitrite (N)	2019/03/28	NC		%	20
6041113	NRG	Matrix Spike [JHH830-04]	Total Alkalinity (Total as CaCO3)	2019/03/28		95	%	80 - 120
6041113	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/28		107	%	80 - 120
6041113	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/28	<5.0		mg/L	
6041113	NRG	RPD [JHH830-04]	Total Alkalinity (Total as CaCO3)	2019/03/28	NC		%	25

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6041119	NRG	Matrix Spike [JHH830-04]	Dissolved Chloride (Cl-)	2019/03/28		102	%	80 - 120
6041119	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/03/28		104	%	80 - 120
6041119	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/03/28		93	%	80 - 120
6041119	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/03/28	<1.0		mg/L	
6041119	NRG	RPD [JHH830-04]	Dissolved Chloride (Cl-)	2019/03/28	13		%	25
6041124	NRG	Matrix Spike [JHH830-04]	Dissolved Sulphate (SO4)	2019/03/28		105	%	80 - 120
6041124	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/03/28		109	%	80 - 120
6041124	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/03/28	<2.0		mg/L	
6041124	NRG	RPD [JHH830-04]	Dissolved Sulphate (SO4)	2019/03/28	NC		%	25
6041125	NRG	Matrix Spike [JHH830-04]	Reactive Silica (SiO2)	2019/03/29		100	%	80 - 120
6041125	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/03/29		100	%	80 - 120
6041125	NRG	Method Blank	Reactive Silica (SiO2)	2019/03/29	<0.50		mg/L	
6041125	NRG	RPD [JHH830-04]	Reactive Silica (SiO2)	2019/03/29	9.1		%	25
6041126	NRG	Spiked Blank	Colour	2019/03/28		83	%	80 - 120
6041126	NRG	Method Blank	Colour	2019/03/28	<5.0		TCU	
6041126	NRG	RPD [JHH830-04]	Colour	2019/03/28	0.20		%	20
6041131	NRG	Matrix Spike [JHH830-04]	Orthophosphate (P)	2019/03/28		94	%	80 - 120
6041131	NRG	Spiked Blank	Orthophosphate (P)	2019/03/28		99	%	80 - 120
6041131	NRG	Method Blank	Orthophosphate (P)	2019/03/28	<0.010		mg/L	
6041131	NRG	RPD [JHH830-04]	Orthophosphate (P)	2019/03/28	NC		%	25
6041132	NRG	Matrix Spike [JHH830-04]	Nitrate + Nitrite (N)	2019/03/28		90	%	80 - 120
6041132	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/03/28		90	%	80 - 120
6041132	NRG	Method Blank	Nitrate + Nitrite (N)	2019/03/28	<0.050		mg/L	
6041132	NRG	RPD [JHH830-04]	Nitrate + Nitrite (N)	2019/03/28	NC		%	25
6041133	NRG	Matrix Spike [JHH830-04]	Nitrite (N)	2019/03/28		94	%	80 - 120
6041133	NRG	Spiked Blank	Nitrite (N)	2019/03/28		96	%	80 - 120
6041133	NRG	Method Blank	Nitrite (N)	2019/03/28	<0.010		mg/L	
6041133	NRG	RPD [JHH830-04]	Nitrite (N)	2019/03/28	NC		%	20
6041142	NRG	Matrix Spike [JHH839-01]	Total Alkalinity (Total as CaCO3)	2019/03/28		105	%	80 - 120
6041142	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/28		109	%	80 - 120
6041142	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/28	<5.0		mg/L	
6041142	NRG	RPD [JHH839-01]	Total Alkalinity (Total as CaCO3)	2019/03/28	NC		%	25
6041145	NRG	Matrix Spike [JHH839-01]	Dissolved Chloride (Cl-)	2019/03/28		101	%	80 - 120
6041145	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/03/28		103	%	80 - 120
6041145	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/03/28		94	%	80 - 120
6041145	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/03/28	<1.0		mg/L	
6041145	NRG	RPD [JHH839-01]	Dissolved Chloride (Cl-)	2019/03/28	5.7		%	25
6041146	NRG	Matrix Spike [JHH839-01]	Dissolved Sulphate (SO4)	2019/03/28		110	%	80 - 120
6041146	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/03/28		105	%	80 - 120
6041146	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/03/28	<2.0		mg/L	
6041146	NRG	RPD [JHH839-01]	Dissolved Sulphate (SO4)	2019/03/28	NC		%	25
6041147	NRG	Matrix Spike [JHH839-01]	Reactive Silica (SiO2)	2019/03/29		99	%	80 - 120
6041147	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/03/29		101	%	80 - 120
6041147	NRG	Method Blank	Reactive Silica (SiO2)	2019/03/29	<0.50		mg/L	
6041147	NRG	RPD [JHH839-01]	Reactive Silica (SiO2)	2019/03/29	10		%	25
6041148	NRG	Spiked Blank	Colour	2019/03/28		90	%	80 - 120
6041148	NRG	Method Blank	Colour	2019/03/28	<5.0		TCU	
6041148	NRG	RPD [JHH839-01]	Colour	2019/03/28	0.37		%	20
6041149	NRG	Matrix Spike [JHH839-01]	Orthophosphate (P)	2019/03/28		93	%	80 - 120
6041149	NRG	Spiked Blank	Orthophosphate (P)	2019/03/28		98	%	80 - 120
6041149	NRG	Method Blank	Orthophosphate (P)	2019/03/28	<0.010		mg/L	
6041149	NRG	RPD [JHH839-01]	Orthophosphate (P)	2019/03/28	NC		%	25
6041150	NRG	Matrix Spike [JHH839-01]	Nitrate + Nitrite (N)	2019/03/28		86	%	80 - 120
6041150	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/03/28		100	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6041150	NRG	Method Blank	Nitrate + Nitrite (N)	2019/03/28	<0.050		mg/L	
6041150	NRG	RPD [JHH839-01]	Nitrate + Nitrite (N)	2019/03/28	NC		%	25
6041151	NRG	Matrix Spike [JHH839-01]	Nitrite (N)	2019/03/28		91	%	80 - 120
6041151	NRG	Spiked Blank	Nitrite (N)	2019/03/28		97	%	80 - 120
6041151	NRG	Method Blank	Nitrite (N)	2019/03/28	<0.010		mg/L	
6041151	NRG	RPD [JHH839-01]	Nitrite (N)	2019/03/28	NC		%	20
6041186	SRM	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/03/28		91	%	80 - 120
6041186	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/03/28		98	%	80 - 120
6041186	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/03/28	<0.050		mg/L	
6041186	SRM	RPD	Nitrogen (Ammonia Nitrogen)	2019/03/28	NC		%	20
6041234	AM6	QC Standard	Total Suspended Solids	2019/03/29		100	%	80 - 120
6041234	AM6	Method Blank	Total Suspended Solids	2019/03/29	<1.0		mg/L	
6041234	AM6	RPD	Total Suspended Solids	2019/03/29	2.3		%	20
6041292	BAN	Matrix Spike	Total Aluminum (Al)	2019/03/29		100	%	80 - 120
			Total Antimony (Sb)	2019/03/29		105	%	80 - 120
			Total Arsenic (As)	2019/03/29		99	%	80 - 120
			Total Barium (Ba)	2019/03/29		NC	%	80 - 120
			Total Beryllium (Be)	2019/03/29		105	%	80 - 120
			Total Bismuth (Bi)	2019/03/29		100	%	80 - 120
			Total Boron (B)	2019/03/29		109	%	80 - 120
			Total Cadmium (Cd)	2019/03/29		99	%	80 - 120
			Total Calcium (Ca)	2019/03/29		NC	%	80 - 120
			Total Chromium (Cr)	2019/03/29		98	%	80 - 120
			Total Cobalt (Co)	2019/03/29		99	%	80 - 120
			Total Copper (Cu)	2019/03/29		NC	%	80 - 120
			Total Iron (Fe)	2019/03/29		101	%	80 - 120
			Total Lead (Pb)	2019/03/29		97	%	80 - 120
			Total Magnesium (Mg)	2019/03/29		103	%	80 - 120
			Total Manganese (Mn)	2019/03/29		98	%	80 - 120
			Total Molybdenum (Mo)	2019/03/29		105	%	80 - 120
			Total Nickel (Ni)	2019/03/29		98	%	80 - 120
			Total Phosphorus (P)	2019/03/29		104	%	80 - 120
			Total Potassium (K)	2019/03/29		103	%	80 - 120
			Total Selenium (Se)	2019/03/29		97	%	80 - 120
			Total Silver (Ag)	2019/03/29		98	%	80 - 120
			Total Sodium (Na)	2019/03/29		99	%	80 - 120
			Total Strontium (Sr)	2019/03/29		NC	%	80 - 120
			Total Thallium (Tl)	2019/03/29		100	%	80 - 120
			Total Tin (Sn)	2019/03/29		102	%	80 - 120
			Total Titanium (Ti)	2019/03/29		99	%	80 - 120
			Total Uranium (U)	2019/03/29		103	%	80 - 120
			Total Vanadium (V)	2019/03/29		99	%	80 - 120
			Total Zirconium (Zr)	2019/03/29		105	%	80 - 120
			Total Zinc (Zn)	2019/03/29		97	%	80 - 120
6041292	BAN	Spiked Blank	Total Aluminum (Al)	2019/03/28		103	%	80 - 120
			Total Antimony (Sb)	2019/03/28		101	%	80 - 120
			Total Arsenic (As)	2019/03/28		97	%	80 - 120
			Total Barium (Ba)	2019/03/28		96	%	80 - 120
			Total Beryllium (Be)	2019/03/28		103	%	80 - 120
			Total Bismuth (Bi)	2019/03/28		103	%	80 - 120
			Total Boron (B)	2019/03/28		107	%	80 - 120
			Total Cadmium (Cd)	2019/03/28		99	%	80 - 120
			Total Calcium (Ca)	2019/03/28		100	%	80 - 120
			Total Chromium (Cr)	2019/03/28		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Cobalt (Co)	2019/03/28		100	%	80 - 120
			Total Copper (Cu)	2019/03/28		98	%	80 - 120
			Total Iron (Fe)	2019/03/28		102	%	80 - 120
			Total Lead (Pb)	2019/03/28		99	%	80 - 120
			Total Magnesium (Mg)	2019/03/28		104	%	80 - 120
			Total Manganese (Mn)	2019/03/28		101	%	80 - 120
			Total Molybdenum (Mo)	2019/03/28		104	%	80 - 120
			Total Nickel (Ni)	2019/03/28		97	%	80 - 120
			Total Phosphorus (P)	2019/03/28		104	%	80 - 120
			Total Potassium (K)	2019/03/28		105	%	80 - 120
			Total Selenium (Se)	2019/03/28		98	%	80 - 120
			Total Silver (Ag)	2019/03/28		98	%	80 - 120
			Total Sodium (Na)	2019/03/28		101	%	80 - 120
			Total Strontium (Sr)	2019/03/28		100	%	80 - 120
			Total Thallium (Tl)	2019/03/28		103	%	80 - 120
			Total Tin (Sn)	2019/03/28		101	%	80 - 120
			Total Titanium (Ti)	2019/03/28		102	%	80 - 120
			Total Uranium (U)	2019/03/28		102	%	80 - 120
			Total Vanadium (V)	2019/03/28		100	%	80 - 120
			Total Zirconium (Zr)	2019/03/28		103	%	80 - 120
			Total Zinc (Zn)	2019/03/28		98	%	80 - 120
6041292	BAN	Method Blank	Total Aluminum (Al)	2019/03/28	<5.0		ug/L	
			Total Antimony (Sb)	2019/03/28	<1.0		ug/L	
			Total Arsenic (As)	2019/03/28	<1.0		ug/L	
			Total Barium (Ba)	2019/03/28	<1.0		ug/L	
			Total Beryllium (Be)	2019/03/28	<1.0		ug/L	
			Total Bismuth (Bi)	2019/03/28	<2.0		ug/L	
			Total Boron (B)	2019/03/28	<50		ug/L	
			Total Cadmium (Cd)	2019/03/28	<0.010		ug/L	
			Total Calcium (Ca)	2019/03/28	<100		ug/L	
			Total Chromium (Cr)	2019/03/28	<1.0		ug/L	
			Total Cobalt (Co)	2019/03/28	<0.40		ug/L	
			Total Copper (Cu)	2019/03/28	<0.50		ug/L	
			Total Iron (Fe)	2019/03/28	<50		ug/L	
			Total Lead (Pb)	2019/03/28	<0.50		ug/L	
			Total Magnesium (Mg)	2019/03/28	<100		ug/L	
			Total Manganese (Mn)	2019/03/28	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/03/28	<2.0		ug/L	
			Total Nickel (Ni)	2019/03/28	<2.0		ug/L	
			Total Phosphorus (P)	2019/03/28	<100		ug/L	
			Total Potassium (K)	2019/03/28	<100		ug/L	
			Total Selenium (Se)	2019/03/28	<1.0		ug/L	
			Total Silver (Ag)	2019/03/28	<0.10		ug/L	
			Total Sodium (Na)	2019/03/28	<100		ug/L	
			Total Strontium (Sr)	2019/03/28	<2.0		ug/L	
			Total Thallium (Tl)	2019/03/28	<0.10		ug/L	
			Total Tin (Sn)	2019/03/28	<2.0		ug/L	
			Total Titanium (Ti)	2019/03/28	<2.0		ug/L	
			Total Uranium (U)	2019/03/28	<0.10		ug/L	
			Total Vanadium (V)	2019/03/28	<2.0		ug/L	
			Total Zirconium (Zr)	2019/03/28	<2.0		ug/L	
			Total Zinc (Zn)	2019/03/28	<5.0		ug/L	
6041292	BAN	RPD	Total Aluminum (Al)	2019/03/29	1.2		%	20
6041328	BAN	Matrix Spike	Dissolved Aluminum (Al)	2019/03/28		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Antimony (Sb)	2019/03/28		97	%	80 - 120
			Dissolved Arsenic (As)	2019/03/28		95	%	80 - 120
			Dissolved Barium (Ba)	2019/03/28		92	%	80 - 120
			Dissolved Beryllium (Be)	2019/03/28		102	%	80 - 120
			Dissolved Bismuth (Bi)	2019/03/28		99	%	80 - 120
			Dissolved Boron (B)	2019/03/28		105	%	80 - 120
			Dissolved Cadmium (Cd)	2019/03/28		97	%	80 - 120
			Dissolved Calcium (Ca)	2019/03/28		NC	%	80 - 120
			Dissolved Chromium (Cr)	2019/03/28		96	%	80 - 120
			Dissolved Cobalt (Co)	2019/03/28		96	%	80 - 120
			Dissolved Copper (Cu)	2019/03/28		95	%	80 - 120
			Dissolved Iron (Fe)	2019/03/28		NC	%	80 - 120
			Dissolved Lead (Pb)	2019/03/28		95	%	80 - 120
			Dissolved Magnesium (Mg)	2019/03/28		NC	%	80 - 120
			Dissolved Manganese (Mn)	2019/03/28		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/03/28		98	%	80 - 120
			Dissolved Nickel (Ni)	2019/03/28		95	%	80 - 120
			Dissolved Phosphorus (P)	2019/03/28		101	%	80 - 120
			Dissolved Potassium (K)	2019/03/28		98	%	80 - 120
			Dissolved Selenium (Se)	2019/03/28		96	%	80 - 120
			Dissolved Silver (Ag)	2019/03/28		91	%	80 - 120
			Dissolved Sodium (Na)	2019/03/28		NC	%	80 - 120
			Dissolved Strontium (Sr)	2019/03/28		NC	%	80 - 120
			Dissolved Thallium (Tl)	2019/03/28		98	%	80 - 120
			Dissolved Tin (Sn)	2019/03/28		98	%	80 - 120
			Dissolved Titanium (Ti)	2019/03/28		97	%	80 - 120
			Dissolved Uranium (U)	2019/03/28		100	%	80 - 120
			Dissolved Vanadium (V)	2019/03/28		98	%	80 - 120
			Dissolved Zirconium (Zr)	2019/03/28		101	%	80 - 120
			Dissolved Zinc (Zn)	2019/03/28		95	%	80 - 120
6041328	BAN	Spiked Blank	Dissolved Aluminum (Al)	2019/03/28		101	%	80 - 120
			Dissolved Antimony (Sb)	2019/03/28		95	%	80 - 120
			Dissolved Arsenic (As)	2019/03/28		96	%	80 - 120
			Dissolved Barium (Ba)	2019/03/28		95	%	80 - 120
			Dissolved Beryllium (Be)	2019/03/28		100	%	80 - 120
			Dissolved Bismuth (Bi)	2019/03/28		100	%	80 - 120
			Dissolved Boron (B)	2019/03/28		103	%	80 - 120
			Dissolved Cadmium (Cd)	2019/03/28		96	%	80 - 120
			Dissolved Calcium (Ca)	2019/03/28		94	%	80 - 120
			Dissolved Chromium (Cr)	2019/03/28		97	%	80 - 120
			Dissolved Cobalt (Co)	2019/03/28		98	%	80 - 120
			Dissolved Copper (Cu)	2019/03/28		98	%	80 - 120
			Dissolved Iron (Fe)	2019/03/28		99	%	80 - 120
			Dissolved Lead (Pb)	2019/03/28		96	%	80 - 120
			Dissolved Magnesium (Mg)	2019/03/28		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/03/28		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/03/28		100	%	80 - 120
			Dissolved Nickel (Ni)	2019/03/28		98	%	80 - 120
			Dissolved Phosphorus (P)	2019/03/28		101	%	80 - 120
			Dissolved Potassium (K)	2019/03/28		101	%	80 - 120
			Dissolved Selenium (Se)	2019/03/28		94	%	80 - 120
			Dissolved Silver (Ag)	2019/03/28		94	%	80 - 120
			Dissolved Sodium (Na)	2019/03/28		101	%	80 - 120
			Dissolved Strontium (Sr)	2019/03/28		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Dissolved Thallium (Tl)	2019/03/28		99	%	80 - 120
				Dissolved Tin (Sn)	2019/03/28		97	%	80 - 120
				Dissolved Titanium (Ti)	2019/03/28		98	%	80 - 120
				Dissolved Uranium (U)	2019/03/28		99	%	80 - 120
				Dissolved Vanadium (V)	2019/03/28		97	%	80 - 120
				Dissolved Zirconium (Zr)	2019/03/28		104	%	80 - 120
				Dissolved Zinc (Zn)	2019/03/28		100	%	80 - 120
6041328	BAN		Method Blank	Dissolved Aluminum (Al)	2019/03/28	<5.0		ug/L	
				Dissolved Antimony (Sb)	2019/03/28	<1.0		ug/L	
				Dissolved Arsenic (As)	2019/03/28	<1.0		ug/L	
				Dissolved Barium (Ba)	2019/03/28	<1.0		ug/L	
				Dissolved Beryllium (Be)	2019/03/28	<1.0		ug/L	
				Dissolved Bismuth (Bi)	2019/03/28	<2.0		ug/L	
				Dissolved Boron (B)	2019/03/28	<50		ug/L	
				Dissolved Cadmium (Cd)	2019/03/28	<0.010		ug/L	
				Dissolved Calcium (Ca)	2019/03/28	<100		ug/L	
				Dissolved Chromium (Cr)	2019/03/28	<1.0		ug/L	
				Dissolved Cobalt (Co)	2019/03/28	<0.40		ug/L	
				Dissolved Copper (Cu)	2019/03/28	<0.50		ug/L	
				Dissolved Iron (Fe)	2019/03/28	<50		ug/L	
				Dissolved Lead (Pb)	2019/03/28	<0.50		ug/L	
				Dissolved Magnesium (Mg)	2019/03/28	<100		ug/L	
				Dissolved Manganese (Mn)	2019/03/28	<2.0		ug/L	
				Dissolved Molybdenum (Mo)	2019/03/28	<2.0		ug/L	
				Dissolved Nickel (Ni)	2019/03/28	<2.0		ug/L	
				Dissolved Phosphorus (P)	2019/03/28	<100		ug/L	
				Dissolved Potassium (K)	2019/03/28	<100		ug/L	
				Dissolved Selenium (Se)	2019/03/28	<1.0		ug/L	
				Dissolved Silver (Ag)	2019/03/28	<0.10		ug/L	
				Dissolved Sodium (Na)	2019/03/28	<100		ug/L	
				Dissolved Strontium (Sr)	2019/03/28	<2.0		ug/L	
				Dissolved Thallium (Tl)	2019/03/28	<0.10		ug/L	
				Dissolved Tin (Sn)	2019/03/28	<2.0		ug/L	
				Dissolved Titanium (Ti)	2019/03/28	<2.0		ug/L	
				Dissolved Uranium (U)	2019/03/28	<0.10		ug/L	
				Dissolved Vanadium (V)	2019/03/28	<2.0		ug/L	
				Dissolved Zirconium (Zr)	2019/03/28	<2.0		ug/L	
				Dissolved Zinc (Zn)	2019/03/28	<5.0		ug/L	
6041328	BAN		RPD	Dissolved Aluminum (Al)	2019/03/28	NC		%	20
				Dissolved Antimony (Sb)	2019/03/28	NC		%	20
				Dissolved Arsenic (As)	2019/03/28	1.2		%	20
				Dissolved Barium (Ba)	2019/03/28	1.6		%	20
				Dissolved Beryllium (Be)	2019/03/28	NC		%	20
				Dissolved Bismuth (Bi)	2019/03/28	NC		%	20
				Dissolved Boron (B)	2019/03/28	NC		%	20
				Dissolved Cadmium (Cd)	2019/03/28	4.4		%	20
				Dissolved Calcium (Ca)	2019/03/28	0.36		%	20
				Dissolved Chromium (Cr)	2019/03/28	NC		%	20
				Dissolved Cobalt (Co)	2019/03/28	0.97		%	20
				Dissolved Copper (Cu)	2019/03/28	0.40		%	20
				Dissolved Iron (Fe)	2019/03/28	0.58		%	20
				Dissolved Lead (Pb)	2019/03/28	NC		%	20
				Dissolved Magnesium (Mg)	2019/03/28	0.50		%	20
				Dissolved Manganese (Mn)	2019/03/28	0.013		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Molybdenum (Mo)	2019/03/28	NC		%	20
			Dissolved Nickel (Ni)	2019/03/28	NC		%	20
			Dissolved Phosphorus (P)	2019/03/28	6.1		%	20
			Dissolved Potassium (K)	2019/03/28	1.0		%	20
			Dissolved Selenium (Se)	2019/03/28	NC		%	20
			Dissolved Silver (Ag)	2019/03/28	NC		%	20
			Dissolved Sodium (Na)	2019/03/28	0.70		%	20
			Dissolved Strontium (Sr)	2019/03/28	0.42		%	20
			Dissolved Thallium (Tl)	2019/03/28	NC		%	20
			Dissolved Tin (Sn)	2019/03/28	NC		%	20
			Dissolved Titanium (Ti)	2019/03/28	NC		%	20
			Dissolved Uranium (U)	2019/03/28	NC		%	20
			Dissolved Vanadium (V)	2019/03/28	NC		%	20
			Dissolved Zinc (Zn)	2019/03/28	2.0		%	20
6041507	HM2	Matrix Spike [JHH836-04]	Total Organic Carbon (C)	2019/03/28		105	%	85 - 115
6041507	HM2	Spiked Blank	Total Organic Carbon (C)	2019/03/28		100	%	80 - 120
6041507	HM2	Method Blank	Total Organic Carbon (C)	2019/03/28	<0.50		mg/L	
6041507	HM2	RPD [JHH836-04]	Total Organic Carbon (C)	2019/03/28	2.9		%	15
6041511	HM2	Matrix Spike	Total Organic Carbon (C)	2019/03/28		100	%	85 - 115
6041511	HM2	Spiked Blank	Total Organic Carbon (C)	2019/03/28		100	%	80 - 120
6041511	HM2	Method Blank	Total Organic Carbon (C)	2019/03/28	<0.50		mg/L	
6041511	HM2	RPD	Total Organic Carbon (C)	2019/03/28	0.32		%	15
6041945	PBA	Matrix Spike	Dissolved Tungsten (W)	2019/04/02		103	%	80 - 120
6041945	PBA	Spiked Blank	Dissolved Tungsten (W)	2019/04/02		99	%	80 - 120
6041945	PBA	Method Blank	Dissolved Tungsten (W)	2019/04/02	<1.0		ug/L	
6043248	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043248	NHU	RPD	pH	2019/03/29	1.3		%	N/A
6043251	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043251	NHU	Method Blank	Conductivity	2019/03/29	1.0, RDL=1.0		uS/cm	
6043251	NHU	RPD	Conductivity	2019/03/29	0.90		%	10
6043252	NHU	Matrix Spike [JHH830-04]	Dissolved Fluoride (F-)	2019/03/29		NC	%	80 - 120
6043252	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/03/29		105	%	80 - 120
6043252	NHU	Method Blank	Dissolved Fluoride (F-)	2019/03/29	<0.10		mg/L	
6043252	NHU	RPD	Dissolved Fluoride (F-)	2019/03/29	NC		%	20
6043255	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043255	NHU	RPD	pH	2019/03/29	2.2		%	N/A
6043256	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043256	NHU	Method Blank	Conductivity	2019/03/29	1.1, RDL=1.0		uS/cm	
6043256	NHU	RPD	Conductivity	2019/03/29	0.19		%	10
6043257	NHU	Matrix Spike	Dissolved Fluoride (F-)	2019/03/29		NC	%	80 - 120
6043257	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/03/29		102	%	80 - 120
6043257	NHU	Method Blank	Dissolved Fluoride (F-)	2019/03/29	<0.10		mg/L	
6043257	NHU	RPD	Dissolved Fluoride (F-)	2019/03/29	NC		%	20
6043258	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043258	NHU	RPD	pH	2019/03/29	0.84		%	N/A
6043260	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043260	NHU	Method Blank	Conductivity	2019/03/29	1.6, RDL=1.0		uS/cm	
6043260	NHU	RPD	Conductivity	2019/03/29	0.20		%	10
6043272	NHU	QC Standard	Turbidity	2019/03/29		102	%	80 - 120
6043272	NHU	Spiked Blank	Turbidity	2019/03/29		100	%	80 - 120
6043272	NHU	Method Blank	Turbidity	2019/03/29	<0.10		NTU	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6043272	NHU	RPD	Turbidity	2019/03/29	NC		%	20
6043274	NHU	QC Standard	Turbidity	2019/03/29		106	%	80 - 120
6043274	NHU	Spiked Blank	Turbidity	2019/03/29		100	%	80 - 120
6043274	NHU	Method Blank	Turbidity	2019/03/29	<0.10		NTU	
6043274	NHU	RPD	Turbidity	2019/03/29	NC		%	20
6043276	NHU	QC Standard	Turbidity	2019/03/29		107	%	80 - 120
6043276	NHU	Spiked Blank	Turbidity	2019/03/29		100	%	80 - 120
6043276	NHU	Method Blank	Turbidity	2019/03/29	<0.10		NTU	
6043276	NHU	RPD [JHH839-01]	Turbidity	2019/03/29	0		%	20
6043584	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/03/29		99	%	80 - 120
6043584	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/29		104	%	80 - 120
6043584	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/29	<5.0		mg/L	
6043584	NRG	RPD	Total Alkalinity (Total as CaCO3)	2019/03/29	NC		%	25
6043586	NRG	Matrix Spike	Dissolved Chloride (Cl-)	2019/04/01		101	%	80 - 120
6043586	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/01		106	%	80 - 120
6043586	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/01		101	%	80 - 120
6043586	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/01	<1.0		mg/L	
6043586	NRG	RPD	Dissolved Chloride (Cl-)	2019/04/01	12		%	25
6043587	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2019/04/01		96	%	80 - 120
6043587	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/01		105	%	80 - 120
6043587	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/01	<2.0		mg/L	
6043587	NRG	RPD	Dissolved Sulphate (SO4)	2019/04/01	NC		%	25
6043589	NRG	Matrix Spike	Reactive Silica (SiO2)	2019/03/29		90	%	80 - 120
6043589	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/03/29		92	%	80 - 120
6043589	NRG	Method Blank	Reactive Silica (SiO2)	2019/03/29	<0.50		mg/L	
6043589	NRG	RPD	Reactive Silica (SiO2)	2019/03/29	2.5		%	25
6043590	NRG	Spiked Blank	Colour	2019/03/29		100	%	80 - 120
6043590	NRG	Method Blank	Colour	2019/03/29	<5.0		TCU	
6043590	NRG	RPD	Colour	2019/03/29	0.58		%	20
6043592	NRG	Matrix Spike	Orthophosphate (P)	2019/04/01		99	%	80 - 120
6043592	NRG	Spiked Blank	Orthophosphate (P)	2019/04/01		107	%	80 - 120
6043592	NRG	Method Blank	Orthophosphate (P)	2019/04/01	<0.010		mg/L	
6043592	NRG	RPD	Orthophosphate (P)	2019/04/01	0.69		%	25
6043593	NRG	Matrix Spike	Nitrate + Nitrite (N)	2019/03/29		92	%	80 - 120
6043593	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/03/29		99	%	80 - 120
6043593	NRG	Method Blank	Nitrate + Nitrite (N)	2019/03/29	<0.050		mg/L	
6043593	NRG	RPD	Nitrate + Nitrite (N)	2019/03/29	9.2		%	25
6043594	NRG	Matrix Spike	Nitrite (N)	2019/03/29		91	%	80 - 120
6043594	NRG	Spiked Blank	Nitrite (N)	2019/03/29		96	%	80 - 120
6043594	NRG	Method Blank	Nitrite (N)	2019/03/29	<0.010		mg/L	
6043594	NRG	RPD	Nitrite (N)	2019/03/29	NC		%	20
6043674	XQI	Matrix Spike	Total Cyanide (CN)	2019/03/29		105	%	80 - 120
6043674	XQI	Spiked Blank	Total Cyanide (CN)	2019/03/29		99	%	80 - 120
6043674	XQI	Method Blank	Total Cyanide (CN)	2019/03/29	<0.0050		mg/L	
6043674	XQI	RPD	Total Cyanide (CN)	2019/03/29	NC		%	20
6043687	XQI	Matrix Spike	Total Cyanide (CN)	2019/03/29		97	%	80 - 120
6043687	XQI	Spiked Blank	Total Cyanide (CN)	2019/03/29		105	%	80 - 120
6043687	XQI	Method Blank	Total Cyanide (CN)	2019/03/29	<0.0050		mg/L	
6043687	XQI	RPD	Total Cyanide (CN)	2019/03/29	NC		%	20
6043931	AM6	QC Standard	Total Dissolved Solids	2019/04/01		93	%	80 - 120
6043931	AM6	Method Blank	Total Dissolved Solids	2019/04/01	<10		mg/L	
6043931	AM6	RPD	Total Dissolved Solids	2019/04/01	0.93		%	25
6044028	HM2	QC Standard	pH	2019/03/29		100	%	97 - 103
6044028	HM2	RPD [JHH844-02]	pH	2019/03/29	1.1		%	N/A

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6045757	PBA	Matrix Spike	Total Tungsten (W)	2019/04/01		101	%	80 - 120
6045757	PBA	Spiked Blank	Total Tungsten (W)	2019/04/01		93	%	80 - 120
6045757	PBA	Method Blank	Total Tungsten (W)	2019/04/01	<1.0		ug/L	
6046252	BBD	Matrix Spike [JHH827-05]	Acidity	2019/04/01		102	%	80 - 120
6046252	BBD	Spiked Blank	Acidity	2019/04/01		103	%	80 - 120
6046252	BBD	Method Blank	Acidity	2019/04/01	<5.0		mg/L	
6046252	BBD	RPD [JHH827-05]	Acidity	2019/04/01	6.1		%	25
6046332	SRM	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/01		106	%	80 - 120
6046332	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01		102	%	80 - 120
6046332	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01	<0.050		mg/L	
6046332	SRM	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/01	NC		%	20
6046333	SRM	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/01		99	%	80 - 120
6046333	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01		99	%	80 - 120
6046333	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01	<0.050		mg/L	
6046333	SRM	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/01	NC		%	20
6046396	NRG	Matrix Spike [JHH829-09]	Total Phosphorus	2019/04/02		106	%	N/A
6046396	NRG	Spiked Blank	Total Phosphorus	2019/04/02		93	%	80 - 120
6046396	NRG	Method Blank	Total Phosphorus	2019/04/02	<0.020		mg/L	
6046396	NRG	RPD [JHH829-09]	Total Phosphorus	2019/04/02	NC		%	25
6046475	BBD	QC Standard	Salinity	2019/04/01		102	%	80 - 120
6046475	BBD	Method Blank	Salinity	2019/04/01	<2.0		N/A	
6046475	BBD	RPD [JHH826-05]	Salinity	2019/04/01	NC		%	25
6046649	PBA	Matrix Spike	Total Tungsten (W)	2019/04/01		97	%	80 - 120
6046649	PBA	Spiked Blank	Total Tungsten (W)	2019/04/01		91	%	80 - 120
6046649	PBA	Method Blank	Total Tungsten (W)	2019/04/01	<1.0		ug/L	
6046649	PBA	RPD	Total Tungsten (W)	2019/04/01	NC		%	20
6046692	CCR	Matrix Spike [JHH844-09]	Total Mercury (Hg)	2019/04/02		98	%	80 - 120
6046692	CCR	Spiked Blank	Total Mercury (Hg)	2019/04/02		102	%	80 - 120
6046692	CCR	Method Blank	Total Mercury (Hg)	2019/04/02	<0.013		ug/L	
6046692	CCR	RPD [JHH842-06]	Total Mercury (Hg)	2019/04/02	NC		%	20
6046858	ZZH	Matrix Spike [JHH828-09]	Total Chemical Oxygen Demand	2019/04/02		102	%	80 - 120
6046858	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/04/02		104	%	80 - 120
6046858	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/04/02		104	%	80 - 120
6046858	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/04/02	<20		mg/L	
6046858	ZZH	RPD [JHH828-09]	Total Chemical Oxygen Demand	2019/04/02	NC		%	25
6049417	éBA	Spiked Blank	WAD Cyanide (Free)	2019/04/02		93	%	80 - 120
6049417	éBA	Method Blank	WAD Cyanide (Free)	2019/04/02	<0.0030		mg/L	
6058342	SHC	Spiked Blank	Radium-226	2019/04/12		101	%	85 - 115
6058342	SHC	Method Blank	Radium-226	2019/04/12	<0.010		Bq/L	
6058342	SHC	RPD	Radium-226	2019/04/12	NC		%	N/A
6067418	SHC	Spiked Blank	Radium-226	2019/04/17		100	%	85 - 115
6067418	SHC	Method Blank	Radium-226	2019/04/17	<0.010		Bq/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6067418	SHC	RPD [JHH830-02]	Radium-226	2019/04/17	NC		%	N/A
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>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)</p> <p>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).</p> <p>(1) Poor spike recovery due to sample matrix, result confirmed by repeat analysis.</p>									

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist



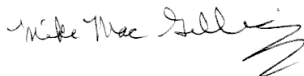
Miryam Assayag



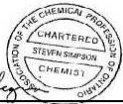
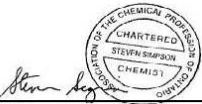
Eric Dearman, Scientific Specialist



Gina Thompson, Inorganics General Chemistry Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)



Steven Simpson, Lab Director

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: 5628
Your Project #: FIFTEEN MILE STREAM
Your C.O.C. #: 707748-03-01

Attention: Ryan Gardiner

McCallum Environmental
2 Bluewater Rd., Suite 135
Bedford, NS
CANADA B4B 1G7

Report Date: 2019/04/16
Report #: R5672784
Version: 5 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B979498

Received: 2019/03/27, 15:45

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Acidity (CaCO3) in water (6)	9	N/A	2019/04/03		SM 22 2310
Carbonate, Bicarbonate and Hydroxide	16	N/A	2019/03/29	N/A	SM 23 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	1	N/A	2019/04/01	N/A	SM 23 4500-CO2 D
Alkalinity	10	N/A	2019/03/29	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity	7	N/A	2019/04/01	ATL SOP 00013	EPA 310.2 R1974 m
Chloride	17	N/A	2019/04/01	ATL SOP 00014	SM 23 4500-Cl- E m
Chemical Oxygen Demand (COD)	9	N/A	2019/04/02	ATL SOP 00042	SM 23 5220D m
Colour	10	N/A	2019/03/29	ATL SOP 00020	SM 23 2120C m
Colour	7	N/A	2019/04/01	ATL SOP 00020	SM 23 2120C m
Total Cyanide (1)	8	2019/04/02	2019/04/02	CAM SOP-00457	OMOE E3015 5 m
Organic carbon - Diss (DOC) (as rec'd) (7)	7	N/A	2019/03/28	ATL SOP 00203	SM 23 5310B m
Organic carbon - Diss (DOC) (as rec'd) (7)	1	N/A	2019/03/29	ATL SOP 00203	SM 23 5310B m
Conductance - water	16	N/A	2019/03/29	ATL SOP 00004	SM 23 2510B m
Conductance - water	1	N/A	2019/04/01	ATL SOP 00004	SM 23 2510B m
Fluoride	8	N/A	2019/03/29	ATL SOP 00043	SM 23 4500-F- C m
Fluoride	1	N/A	2019/04/01	ATL SOP 00043	SM 23 4500-F- C m
Hardness (calculated as CaCO3)	9	N/A	2019/03/29	ATL SOP 00048	Auto Calc
Hardness (calculated as CaCO3)	8	N/A	2019/04/02	ATL SOP 00048	Auto Calc
Mercury - Dissolved (CVAA,LL)	8	2019/04/02	2019/04/03	ATL SOP 00026	EPA 245.1 R3 m
Mercury - Total (CVAA,LL)	9	2019/04/01	2019/04/02	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Diss. MS (as rec'd)	8	N/A	2019/04/01	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	1	2019/03/28	2019/03/28	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	4	2019/03/28	2019/03/29	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	4	2019/03/29	2019/03/29	ATL SOP 00058	EPA 6020B R2 m
Dissolved Metals by ICPMS (1)	8	N/A	2019/04/02	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	8	N/A	2019/04/04	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	15	N/A	2019/04/02	N/A	Auto Calc.
Anion and Cation Sum	17	N/A	2019/04/02	N/A	Auto Calc.
Weak Acid Dissociable Cyanides (2)	8	2019/04/01	2019/04/03	STL SOP-00035	MA300-CN 1.2 R3 m
Nitrogen Ammonia - water	17	N/A	2019/04/01	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	10	N/A	2019/03/29	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrate + Nitrite	7	N/A	2019/04/02	ATL SOP 00016	USGS I-2547-11m

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Report Date: 2019/04/16
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B979498

Received: 2019/03/27, 15:45

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Nitrogen - Nitrite	10	N/A	2019/03/29	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrite	7	N/A	2019/04/01	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	10	N/A	2019/04/01	ATL SOP 00018	ASTM D3867-16
Nitrogen - Nitrate (as N)	7	N/A	2019/04/02	ATL SOP 00018	ASTM D3867-16
pH (8)	16	N/A	2019/03/29	ATL SOP 00003	SM 23 4500-H+ B m
pH (8)	1	N/A	2019/04/01	ATL SOP 00003	SM 23 4500-H+ B m
Phosphorus - ortho	17	N/A	2019/04/01	ATL SOP 00021	SM 23 4500-P E m
Radium Isotopes by Alpha Spectrometry (3, 9)	8	N/A	2019/04/10	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry
Salinity (6)	9	N/A	2019/04/03		SM 22 2520B
Sat. pH and Langelier Index (@ 20C)	7	N/A	2019/03/29	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	10	N/A	2019/04/02	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	7	N/A	2019/03/29	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	10	N/A	2019/04/02	ATL SOP 00049	Auto Calc.
Reactive Silica	10	N/A	2019/03/29	ATL SOP 00022	EPA 366.0 m
Reactive Silica	7	N/A	2019/04/01	ATL SOP 00022	EPA 366.0 m
Sulphate	17	N/A	2019/04/01	ATL SOP 00023	ASTM D516-16 m
Chlorophyll A (Sub from Bedford) (4)	8	2019/04/01	2019/04/02		
Methyl Mercury (sub from Bedford) (5)	8	N/A	2019/04/04		EPA 1630
Total Dissolved Solids (Filt. Residue)	1	2019/03/27	2019/04/03	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (Filt. Residue)	4	2019/03/28	2019/04/03	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (Filt. Residue)	4	2019/03/29	2019/04/03	ATL SOP 00009	SM 23 2540C m
Total Dissolved Solids (TDS calc)	17	N/A	2019/04/02	N/A	Auto Calc.
Organic carbon - Total (TOC) (10)	3	N/A	2019/03/28	ATL SOP 00203	SM 23 5310B m
Organic carbon - Total (TOC) (10)	14	N/A	2019/03/29	ATL SOP 00203	SM 23 5310B m
Phosphorus Total Colourimetry	9	2019/04/01	2019/04/02	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	5	2019/03/28	2019/04/04	ATL SOP 00007	SM 23 2540D m
Total Suspended Solids	4	2019/03/29	2019/04/03	ATL SOP 00007	SM 23 2540D m
Turbidity	16	N/A	2019/03/29	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	1	N/A	2019/04/01	ATL SOP 00011	EPA 180.1 R2 m

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CERTIFICATE OF ANALYSIS

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Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.

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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 Maxxam Analytics Mississauga
- (2) This test was performed by Bedford To Montreal Offsite
- (3) This test was performed by Maxxam Analytics Kitimat
- (4) This test was performed by Dalhousie Dept of Oceanography
- (5) This test was performed by Sub Bedford to Flett Research
- (6) Non-accredited test method
- (7) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC
- (8) 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.
- (9) Radium-226 results have not been corrected for blanks.
- (10) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

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Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Maryann Comeau, Project Manager
Email: MComeau@maxxam.ca
Phone# (902) 420-0203

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RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL218			JHL218			JHL219		
Sampling Date		2019/03/27 08:40			2019/03/27 08:40			2019/03/27 13:25		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW6	RDL	QC Batch	SW6 Lab-Dup	RDL	QC Batch	SW8	RDL	QC Batch

Calculated Parameters

Anion Sum	me/L	0.220	N/A	6040054				0.130	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Calculated TDS	mg/L	15	1.0	6040060				11	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Cation Sum	me/L	0.190	N/A	6040054				0.180	N/A	6040054
Hardness (CaCO3)	mg/L	2.7	1.0	6040051				2.7	1.0	6040051
Ion Balance (% Difference)	%	7.32	N/A	6040052				16.1	N/A	6040052
Langelier Index (@ 20C)	N/A	NC		6040056				NC		6040056
Langelier Index (@ 4C)	N/A	NC		6040058				NC		6040058
Nitrate (N)	mg/L	0.063	0.050	6039487				0.052	0.050	6039487
Saturation pH (@ 20C)	N/A	NC		6040056				NC		6040056
Saturation pH (@ 4C)	N/A	NC		6040058				NC		6040058

Inorganics

Acidity	mg/L	5.2	5.0	6050439				<5.0	5.0	6050439
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6046553				<5.0	5.0	6043602
Total Chemical Oxygen Demand	mg/L	20	20	6046858				20	20	6046858
Dissolved Chloride (Cl-)	mg/L	4.8	1.0	6046555				4.4	1.0	6043606
Colour	TCU	47 (1)	10	6046559				42	5.0	6043609
Total Dissolved Solids	mg/L	36	10	6048909				22	10	6048909
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043257				<0.10	0.10	6043252
Nitrate + Nitrite (N)	mg/L	0.063	0.050	6046561				0.052	0.050	6043611
Nitrite (N)	mg/L	<0.010	0.010	6046562				<0.010	0.010	6043612
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046334				<0.050	0.050	6046334
Total Organic Carbon (C)	mg/L	5.9	0.50	6041511				5.8	0.50	6041511
Orthophosphate (P)	mg/L	<0.010	0.010	6046560				<0.010	0.010	6043610
pH	pH	6.48	N/A	6043255				5.82	N/A	6043248
Total Phosphorus	mg/L	<0.020	0.020	6046396				<0.020	0.020	6046396
Salinity	N/A	<2.0	2.0	6050873	<2.0	2.0	6050873	<2.0	2.0	6050873
Reactive Silica (SiO2)	mg/L	2.3	0.50	6046557				2.4	0.50	6043608
Total Suspended Solids	mg/L	1.0	1.0	6043380				2.0	1.0	6043380
Dissolved Sulphate (SO4)	mg/L	3.7	2.0	6046556				<2.0	2.0	6043607

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL218			JHL218			JHL219		
Sampling Date		2019/03/27 08:40			2019/03/27 08:40			2019/03/27 13:25		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW6	RDL	QC Batch	SW6 Lab-Dup	RDL	QC Batch	SW8	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6048783				<0.0050	0.0050	6048783
Turbidity	NTU	1.3	0.10	6043274				0.64	0.10	6043274
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6053364	<0.0030	0.0030	6053364	<0.0030	0.0030	6053364
Conductivity	uS/cm	26	1.0	6043256				23	1.0	6043251
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6046966				<0.010	0.010	6046966
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6046443				ATTACHED	N/A	6046443
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL220			JHL220			JHL221		
Sampling Date		2019/03/27 12:30			2019/03/27 12:30			2019/03/27 11:30		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW9	RDL	QC Batch	SW9 Lab-Dup	RDL	QC Batch	SW10	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	0.140	N/A	6040054				0.130	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Calculated TDS	mg/L	12	1.0	6040060				12	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Cation Sum	me/L	0.190	N/A	6040054				0.180	N/A	6040054
Hardness (CaCO3)	mg/L	2.9	1.0	6040051				2.6	1.0	6040051
Ion Balance (% Difference)	%	15.2	N/A	6040052				16.1	N/A	6040052
Langelier Index (@ 20C)	N/A	NC		6040056				NC		6040056
Langelier Index (@ 4C)	N/A	NC		6040058				NC		6040058
Nitrate (N)	mg/L	0.070	0.050	6039487				<0.050	0.050	6039487
Saturation pH (@ 20C)	N/A	NC		6040056				NC		6040056
Saturation pH (@ 4C)	N/A	NC		6040058				NC		6040058
Inorganics										
Acidity	mg/L	<5.0	5.0	6050439				5.4	5.0	6050439
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6043602				<5.0	5.0	6046533
Total Chemical Oxygen Demand	mg/L	23	20	6046858				20	20	6046858
Dissolved Chloride (Cl-)	mg/L	4.7	1.0	6043606				4.5	1.0	6046545
Colour	TCU	40	5.0	6043609				43	5.0	6046548
Total Dissolved Solids	mg/L	27	10	6048909				22	10	6048909
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043252				<0.10	0.10	6046246
Nitrate + Nitrite (N)	mg/L	0.070	0.050	6043611				<0.050	0.050	6046550
Nitrite (N)	mg/L	<0.010	0.010	6043612				<0.010	0.010	6046551
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046334				<0.050	0.050	6046333
Total Organic Carbon (C)	mg/L	5.6	0.50	6041511	5.6	0.50	6041511	5.7	0.50	6043293
Orthophosphate (P)	mg/L	<0.010	0.010	6043610				<0.010	0.010	6046549
pH	pH	5.73	N/A	6043248				7.11 (1)	N/A	6046244
Total Phosphorus	mg/L	<0.020	0.020	6046396				<0.020	0.020	6046396
Salinity	N/A	<2.0	2.0	6050873				<2.0	2.0	6050873
Reactive Silica (SiO2)	mg/L	2.4	0.50	6043608				4.0	0.50	6046547
Total Suspended Solids	mg/L	2.0	1.0	6043380				<1.0	1.0	6043380
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6043607				<2.0	2.0	6046546
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable (1) Poor duplicate recovery due to sample matrix. Results confirmed by reanalysis.										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL220			JHL220			JHL221		
Sampling Date		2019/03/27 12:30			2019/03/27 12:30			2019/03/27 11:30		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW9	RDL	QC Batch	SW9 Lab-Dup	RDL	QC Batch	SW10	RDL	QC Batch
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6048783				<0.0050	0.0050	6048783
Turbidity	NTU	1.6	0.10	6043274				0.89	0.10	6046291
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6053364				<0.0030	0.0030	6053364
Conductivity	uS/cm	24	1.0	6043251				26	1.0	6046245
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6046966				<0.010	0.010	6046966
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6046443				ATTACHED	N/A	6046443
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL221			JHL223			JHL223		
Sampling Date		2019/03/27 11:30			2019/03/27 09:40			2019/03/27 09:40		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW10 Lab-Dup	RDL	QC Batch	SW11	RDL	QC Batch	SW11 Lab-Dup	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.0900	N/A	6040054			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6040048			
Calculated TDS	mg/L				8.0	1.0	6040060			
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6040048			
Cation Sum	me/L				0.110	N/A	6040054			
Hardness (CaCO3)	mg/L				1.4	1.0	6040051			
Ion Balance (% Difference)	%				10.0	N/A	6040052			
Langelier Index (@ 20C)	N/A				NC		6040056			
Langelier Index (@ 4C)	N/A				NC		6040058			
Nitrate (N)	mg/L				0.19	0.050	6039487			
Saturation pH (@ 20C)	N/A				NC		6040056			
Saturation pH (@ 4C)	N/A				NC		6040058			

Inorganics										
Acidity	mg/L				7.2	5.0	6050439			
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6043584	<5.0	5.0	6043584
Total Chemical Oxygen Demand	mg/L				<20	20	6046858			
Dissolved Chloride (Cl-)	mg/L				2.8	1.0	6043586	2.5	1.0	6043586
Colour	TCU				31	5.0	6043590	31	5.0	6043590
Total Dissolved Solids	mg/L				18	10	6048909			
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6046246	<0.10	0.10	6043252			
Nitrate + Nitrite (N)	mg/L				0.19	0.050	6043593	0.17	0.050	6043593
Nitrite (N)	mg/L				<0.010	0.010	6043594	<0.010	0.010	6043594
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6046333			
Total Organic Carbon (C)	mg/L				4.8	0.50	6043293			
Orthophosphate (P)	mg/L				0.014	0.010	6043592	0.015	0.010	6043592
pH	pH	6.03	N/A	6046244	5.17	N/A	6043248			
Total Phosphorus	mg/L				<0.020	0.020	6046396			
Salinity	N/A				<2.0	2.0	6050873			
Reactive Silica (SiO2)	mg/L				1.6	0.50	6043589	1.6	0.50	6043589
Total Suspended Solids	mg/L				1.2	1.0	6041306			
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6043587	<2.0	2.0	6043587
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6048783	<0.0050	0.0050	6048783			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL221			JHL223			JHL223		
Sampling Date		2019/03/27 11:30			2019/03/27 09:40			2019/03/27 09:40		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	SW10 Lab-Dup	RDL	QC Batch	SW11	RDL	QC Batch	SW11 Lab-Dup	RDL	QC Batch
Turbidity	NTU				0.64	0.10	6043274			
WAD Cyanide (Free)	mg/L				<0.0030	0.0030	6053364			
Conductivity	uS/cm	25	1.0	6046245	21	1.0	6043251			
RADIONUCLIDE										
Radium-226	Bq/L				<0.010	0.010	6046966			
Subcontracted Analysis										
Subcontract Parameter	N/A				ATTACHED	N/A	6046443			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL224			JHL225		
Sampling Date		2019/03/27 10:40			2019/03/27 09:50		
COC Number		707748-03-01			707748-03-01		
	UNITS	SW12	RDL	QC Batch	FIELD/FILTER BLANK	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	0.0700	N/A	6040054	0.00	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048	<1.0	1.0	6040048
Calculated TDS	mg/L	5.0	1.0	6040060	<1.0	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048	<1.0	1.0	6040048
Cation Sum	me/L	0.0900	N/A	6040054	0.00	N/A	6040054
Hardness (CaCO3)	mg/L	1.3	1.0	6040051	<1.0	1.0	6040051
Ion Balance (% Difference)	%	12.5	N/A	6040052			
Langelier Index (@ 20C)	N/A	NC		6040056	NC		6040056
Langelier Index (@ 4C)	N/A	NC		6040058	NC		6040058
Nitrate (N)	mg/L	<0.050	0.050	6039487	0.063	0.050	6039487
Saturation pH (@ 20C)	N/A	NC		6040056	NC		6040056
Saturation pH (@ 4C)	N/A	NC		6040058	NC		6040058
Inorganics							
Acidity	mg/L	9.0	5.0	6050439	<5.0	5.0	6050439
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6043602	<5.0	5.0	6043602
Total Chemical Oxygen Demand	mg/L	<20	20	6046858	<20	20	6046858
Dissolved Chloride (Cl-)	mg/L	2.4	1.0	6043606	<1.0	1.0	6043606
Colour	TCU	22	5.0	6043609	<5.0	5.0	6043609
Total Dissolved Solids	mg/L	<10	10	6048909	<10	10	6048909
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043252	<0.10	0.10	6043252
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6043611	0.063	0.050	6043611
Nitrite (N)	mg/L	<0.010	0.010	6043612	<0.010	0.010	6043612
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046334	<0.050	0.050	6046334
Total Organic Carbon (C)	mg/L	3.0	0.50	6043293	<0.50	0.50	6043293
Orthophosphate (P)	mg/L	<0.010	0.010	6043610	<0.010	0.010	6043610
pH	pH	5.53	N/A	6043248	6.57	N/A	6043255
Total Phosphorus	mg/L	<0.020	0.020	6046396	<0.020	0.020	6046396
Salinity	N/A	<2.0	2.0	6050873	<2.0	2.0	6050873
Reactive Silica (SiO2)	mg/L	0.99	0.50	6043608	<0.50	0.50	6043608
Total Suspended Solids	mg/L	<1.0	1.0	6041306	<1.0	1.0	6041306
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6043607	<2.0	2.0	6043607
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6048783	<0.0050	0.0050	6048783
Turbidity	NTU	0.16	0.10	6043274	<0.10	0.10	6043276
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL224			JHL225		
Sampling Date		2019/03/27 10:40			2019/03/27 09:50		
COC Number		707748-03-01			707748-03-01		
	UNITS	SW12	RDL	QC Batch	FIELD/FILTER BLANK	RDL	QC Batch
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6053364	<0.0030	0.0030	6053364
Conductivity	uS/cm	14	1.0	6043251	1.2	1.0	6043256
RADIONUCLIDE							
Radium-226	Bq/L	<0.010	0.010	6046966	<0.010	0.010	6046966
Subcontracted Analysis							
Subcontract Parameter	N/A	ATTACHED	N/A	6046443	ATTACHED	N/A	6046442
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable							

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL226			JHL226			JHL228		
Sampling Date		2019/03/27 10:40			2019/03/27 10:40			2019/03/27 08:40		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	FMS DUP 2	RDL	QC Batch	FMS DUP 2 Lab-Dup	RDL	QC Batch	SW6 FF	RDL	QC Batch

Calculated Parameters

Anion Sum	me/L	0.130	N/A	6040054				0.130	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Calculated TDS	mg/L	11	1.0	6040060				11	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	6040048				<1.0	1.0	6040048
Cation Sum	me/L	0.190	N/A	6040054				0.190	N/A	6040054
Hardness (CaCO3)	mg/L	2.7	1.0	6040051				2.9	1.0	6040051
Ion Balance (% Difference)	%	18.8	N/A	6040052				18.8	N/A	6040052
Langelier Index (@ 20C)	N/A	NC		6040056				NC		6040056
Langelier Index (@ 4C)	N/A	NC		6040058				NC		6040058
Nitrate (N)	mg/L	<0.050	0.050	6039487				0.076	0.050	6039487
Saturation pH (@ 20C)	N/A	NC		6040056				NC		6040056
Saturation pH (@ 4C)	N/A	NC		6040058				NC		6040058

Inorganics

Acidity	mg/L	<5.0	5.0	6050439						
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	6043602	<5.0	5.0	6043602	<5.0	5.0	6046553
Total Chemical Oxygen Demand	mg/L	20	20	6046858						
Dissolved Chloride (Cl-)	mg/L	4.7	1.0	6043606	4.7	1.0	6043606	4.5	1.0	6046555
Colour	TCU	47	5.0	6043609	47	5.0	6043609	46 (1)	10	6046559
Total Dissolved Solids	mg/L	25	10	6048909						
Dissolved Fluoride (F-)	mg/L	<0.10	0.10	6043257						
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	6043611	<0.050	0.050	6043611	0.076	0.050	6046561
Nitrite (N)	mg/L	<0.010	0.010	6043612	<0.010	0.010	6043612	<0.010	0.010	6046562
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046334				<0.050	0.050	6046334
Dissolved Organic Carbon (C)	mg/L							6.0	0.5	6041474
Total Organic Carbon (C)	mg/L	5.9	0.50	6043293				5.6	0.50	6043293
Orthophosphate (P)	mg/L	<0.010	0.010	6043610	<0.010	0.010	6043610	<0.010	0.010	6046560
pH	pH	7.22	N/A	6043255				5.69	N/A	6043258
Total Phosphorus	mg/L	<0.020	0.020	6046396						
Salinity	N/A	<2.0	2.0	6050873						
Reactive Silica (SiO2)	mg/L	1.9	0.50	6043608	1.9	0.50	6043608	2.3	0.50	6046557
Total Suspended Solids	mg/L	<1.0	1.0	6041306						

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

(1) Elevated reporting limit due to sample matrix.

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL226			JHL226			JHL228		
Sampling Date		2019/03/27 10:40			2019/03/27 10:40			2019/03/27 08:40		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	FMS DUP 2	RDL	QC Batch	FMS DUP 2 Lab-Dup	RDL	QC Batch	SW6 FF	RDL	QC Batch
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	6043607	<2.0	2.0	6043607	<2.0	2.0	6046556
Total Cyanide (CN)	mg/L	<0.0050	0.0050	6048783						
Turbidity	NTU	1.1	0.10	6043274				0.12	0.10	6043276
WAD Cyanide (Free)	mg/L	<0.0030	0.0030	6053364						
Conductivity	uS/cm	27	1.0	6043256				24	1.0	6043260
RADIONUCLIDE										
Radium-226	Bq/L	<0.010	0.010	6046966						
Subcontracted Analysis										
Subcontract Parameter	N/A	ATTACHED	N/A	6046443						
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL229		JHL230		JHL231		
Sampling Date		2019/03/27 13:25		2019/03/27 12:30		2019/03/27 11:30		
COC Number		707748-03-01		707748-03-01		707748-03-01		
	UNITS	SW8 FF	QC Batch	SW9 FF	QC Batch	SW10 FF	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	0.120	6040054	0.140	6040054	0.120	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	6040048	<1.0	6040048	<1.0	1.0	6040048
Calculated TDS	mg/L	11	6040060	12	6040060	11	1.0	6040060
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	<1.0	6040048	<1.0	6040048	<1.0	1.0	6040048
Cation Sum	me/L	0.190	6040054	0.190	6040054	0.180	N/A	6040054
Hardness (CaCO ₃)	mg/L	2.8	6040051	2.9	6040051	2.8	1.0	6040051
Ion Balance (% Difference)	%	22.6	6040052	15.2	6040052	20.0	N/A	6040052
Langelier Index (@ 20C)	N/A	NC	6040056	NC	6040056	NC		6040056
Langelier Index (@ 4C)	N/A	NC	6040058	NC	6040058	NC		6040058
Nitrate (N)	mg/L	0.064	6039487	0.069	6039487	0.061	0.050	6039487
Saturation pH (@ 20C)	N/A	NC	6040056	NC	6040056	NC		6040056
Saturation pH (@ 4C)	N/A	NC	6040058	NC	6040058	NC		6040058
Inorganics								
Total Alkalinity (Total as CaCO ₃)	mg/L	<5.0	6046553	<5.0	6046553	<5.0	5.0	6043602
Dissolved Chloride (Cl ⁻)	mg/L	4.0	6046555	4.7	6046555	4.1	1.0	6043606
Colour	TCU	45	6046559	42	6046559	39	5.0	6043609
Nitrate + Nitrite (N)	mg/L	0.064	6046561	0.069	6046561	0.061	0.050	6043611
Nitrite (N)	mg/L	<0.010	6046562	<0.010	6046562	<0.010	0.010	6043612
Nitrogen (Ammonia Nitrogen)	mg/L	0.050	6046334	<0.050	6046333	<0.050	0.050	6046334
Dissolved Organic Carbon (C)	mg/L	5.9	6041474	6.2	6041474	6.4	0.5	6041474
Total Organic Carbon (C)	mg/L	5.3	6043293	5.3	6043378	5.4	0.50	6043293
Orthophosphate (P)	mg/L	<0.010	6046560	<0.010	6046560	<0.010	0.010	6043610
pH	pH	5.41	6043258	5.41	6043258	5.40	N/A	6043258
Reactive Silica (SiO ₂)	mg/L	2.6	6046557	2.6	6046557	2.5	0.50	6043608
Dissolved Sulphate (SO ₄)	mg/L	<2.0	6046556	<2.0	6046556	<2.0	2.0	6043607
Turbidity	NTU	<0.10	6043274	<0.10	6043274	<0.10	0.10	6043274
Conductivity	uS/cm	23	6043260	25	6043260	23	1.0	6043260
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL232		JHL233		JHL234		
Sampling Date		2019/03/27 09:40		2019/03/27 10:40		2019/03/27 09:50		
COC Number		707748-03-01		707748-03-01		707748-03-01		
	UNITS	SW11 FF	QC Batch	SW12 F	QC Batch	FIELD/FILTER FF	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	0.0900	6040054	0.0800	6040054	0.00	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	6040048	<1.0	6040048	<1.0	1.0	6040048
Calculated TDS	mg/L	7.0	6040060	6.0	6040060	<1.0	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	6040048	<1.0	6040048	<1.0	1.0	6040048
Cation Sum	me/L	0.100	6040054	0.0900	6040054	0.0100	N/A	6040054
Hardness (CaCO3)	mg/L	1.3	6040051	1.4	6040051	<1.0	1.0	6040051
Ion Balance (% Difference)	%	5.26	6040052	5.88	6040052	100	N/A	6040052
Langelier Index (@ 20C)	N/A	NC	6040056	NC	6040056	NC		6040056
Langelier Index (@ 4C)	N/A	NC	6040058	NC	6040058	NC		6040058
Nitrate (N)	mg/L	0.067	6039487	0.071	6039487	<0.050	0.050	6039487
Saturation pH (@ 20C)	N/A	NC	6040056	NC	6040056	NC		6040056
Saturation pH (@ 4C)	N/A	NC	6040058	NC	6040058	NC		6040058
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	6046553	<5.0	6046553	<5.0	5.0	6043602
Dissolved Chloride (Cl-)	mg/L	3.0	6046555	2.7	6046555	<1.0	1.0	6043606
Colour	TCU	30	6046559	24	6046559	<5.0	5.0	6043609
Nitrate + Nitrite (N)	mg/L	0.067	6046561	0.071	6046561	<0.050	0.050	6043611
Nitrite (N)	mg/L	<0.010	6046562	<0.010	6046562	<0.010	0.010	6043612
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	6046334	<0.050	6046333	<0.050	0.050	6046334
Dissolved Organic Carbon (C)	mg/L	5.1	6041474	3.3	6041474	<0.5	0.5	6041474
Total Organic Carbon (C)	mg/L	4.3	6043378	2.9	6043293	<0.50	0.50	6043293
Orthophosphate (P)	mg/L	<0.010	6046560	<0.010	6046560	<0.010	0.010	6043610
pH	pH	5.43	6043258	5.77	6043258	5.86	N/A	6043258
Reactive Silica (SiO2)	mg/L	1.6	6046557	1.1	6046557	<0.50	0.50	6043608
Dissolved Sulphate (SO4)	mg/L	<2.0	6046556	<2.0	6046556	<2.0	2.0	6043607
Turbidity	NTU	<0.10	6043274	<0.10	6043274	<0.10	0.10	6043276
Conductivity	uS/cm	17	6043260	15	6043260	1.1	1.0	6043260
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL234			JHL235			JHL237		
Sampling Date		2019/03/27 09:50			2019/03/27 10:40			2019/03/27		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	FIELD/FILTER FF Lab-Dup	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch

Calculated Parameters										
Anion Sum	me/L				0.120	N/A	6040054	0.00	N/A	6040054
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6040048	<1.0	1.0	6040048
Calculated TDS	mg/L				11	1.0	6040060	<1.0	1.0	6040060
Carb. Alkalinity (calc. as CaCO3)	mg/L				<1.0	1.0	6040048	<1.0	1.0	6040048
Cation Sum	me/L				0.190	N/A	6040054	0.00	N/A	6040054
Hardness (CaCO3)	mg/L				2.7	1.0	6040051	<1.0	1.0	6040051
Ion Balance (% Difference)	%				22.6	N/A	6040052			
Langelier Index (@ 20C)	N/A				NC		6040056	NC		6040056
Langelier Index (@ 4C)	N/A				NC		6040058	NC		6040058
Nitrate (N)	mg/L				0.054	0.050	6039487	0.054	0.050	6039487
Saturation pH (@ 20C)	N/A				NC		6040056	NC		6040056
Saturation pH (@ 4C)	N/A				NC		6040058	NC		6040058
Inorganics										
Acidity	mg/L							<5.0	5.0	6050439
Total Alkalinity (Total as CaCO3)	mg/L				<5.0	5.0	6043602	<5.0	5.0	6043602
Total Chemical Oxygen Demand	mg/L							<20	20	6046858
Dissolved Chloride (Cl-)	mg/L				4.2	1.0	6043606	<1.0	1.0	6043606
Colour	TCU				47	5.0	6043609	<5.0	5.0	6043609
Total Dissolved Solids	mg/L							<10	10	6048909
Dissolved Fluoride (F-)	mg/L							<0.10	0.10	6043252
Nitrate + Nitrite (N)	mg/L				0.054	0.050	6043611	0.054	0.050	6043611
Nitrite (N)	mg/L				<0.010	0.010	6043612	<0.010	0.010	6043612
Nitrogen (Ammonia Nitrogen)	mg/L				<0.050	0.050	6046344	<0.050	0.050	6046333
Dissolved Organic Carbon (C)	mg/L	<0.5	0.5	6041474	6.5	0.5	6041474			
Total Organic Carbon (C)	mg/L				5.6	0.50	6043378	<0.50	0.50	6043293
Orthophosphate (P)	mg/L				<0.010	0.010	6043610	<0.010	0.010	6043610
pH	pH				5.39	N/A	6043258	6.07	N/A	6043248
Total Phosphorus	mg/L							<0.020	0.020	6046396
Salinity	N/A							<2.0	2.0	6050873
Reactive Silica (SiO2)	mg/L				2.1	0.50	6043608	<0.50	0.50	6043608
Total Suspended Solids	mg/L							<1.0	1.0	6041306
Dissolved Sulphate (SO4)	mg/L				<2.0	2.0	6043607	<2.0	2.0	6043607

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

RESULTS OF ANALYSES OF WATER

Maxxam ID		JHL234			JHL235			JHL237		
Sampling Date		2019/03/27 09:50			2019/03/27 10:40			2019/03/27		
COC Number		707748-03-01			707748-03-01			707748-03-01		
	UNITS	FIELD/FILTER FF Lab-Dup	RDL	QC Batch	FMS DUP 2 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Turbidity	NTU				0.25	0.10	6043276	<0.10	0.10	6043276
Conductivity	uS/cm				24	1.0	6043260	1.4	1.0	6043251
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										

Maxxam ID		JHL237		
Sampling Date		2019/03/27		
COC Number		707748-03-01		
	UNITS	TRIP BLANK Lab-Dup	RDL	QC Batch
Inorganics				
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	6046333
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate				

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		JHL218	JHL219	JHL220	JHL221	JHL223	JHL224		
Sampling Date		2019/03/27 08:40	2019/03/27 13:25	2019/03/27 12:30	2019/03/27 11:30	2019/03/27 09:40	2019/03/27 10:40		
COC Number		707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01		
	UNITS	SW6	SW8	SW9	SW10	SW11	SW12	RDL	QC Batch

Metals									
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	6046699

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		JHL225	JHL226			JHL228	JHL228		
Sampling Date		2019/03/27 09:50	2019/03/27 10:40			2019/03/27 08:40	2019/03/27 08:40		
COC Number		707748-03-01	707748-03-01			707748-03-01	707748-03-01		
	UNITS	FIELD/FILTER BLANK	FMS DUP 2	RDL	QC Batch	SW6 FF	SW6 FF Lab-Dup	RDL	QC Batch

Metals									
Dissolved Mercury (Hg)	ug/L					<0.013	<0.013	0.013	6048242
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	6046699				

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		JHL229	JHL230	JHL231	JHL232	JHL233	JHL234		
Sampling Date		2019/03/27 13:25	2019/03/27 12:30	2019/03/27 11:30	2019/03/27 09:40	2019/03/27 10:40	2019/03/27 09:50		
COC Number		707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01		
	UNITS	SW8 FF	SW9 FF	SW10 FF	SW11 FF	SW12 F	FIELD/FILTER FF	RDL	QC Batch

Metals									
Dissolved Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	6048242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		JHL235			JHL237		
Sampling Date		2019/03/27 10:40			2019/03/27		
COC Number		707748-03-01			707748-03-01		
	UNITS	FMS DUP 2 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Metals							
Dissolved Mercury (Hg)	ug/L	<0.013	0.013	6048242			
Total Mercury (Hg)	ug/L				<0.013	0.013	6046699
RDL = Reportable Detection Limit QC Batch = Quality Control Batch							

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHL218	JHL219		JHL220		JHL221		
Sampling Date		2019/03/27 08:40	2019/03/27 13:25		2019/03/27 12:30		2019/03/27 11:30		
COC Number		707748-03-01	707748-03-01		707748-03-01		707748-03-01		
	UNITS	SW6	SW8	QC Batch	SW9	QC Batch	SW10	RDL	QC Batch
Metals									
Total Aluminum (Al)	ug/L	170	190	6041292	200	6043242	210	5.0	6041292
Total Antimony (Sb)	ug/L	<1.0	<1.0	6041292	<1.0	6043242	<1.0	1.0	6041292
Total Arsenic (As)	ug/L	<1.0	<1.0	6041292	<1.0	6043242	<1.0	1.0	6041292
Total Barium (Ba)	ug/L	3.7	4.9	6041292	5.4	6043242	5.1	1.0	6041292
Total Beryllium (Be)	ug/L	<1.0	<1.0	6041292	<1.0	6043242	<1.0	1.0	6041292
Total Bismuth (Bi)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Boron (B)	ug/L	<50	<50	6041292	<50	6043242	<50	50	6041292
Total Cadmium (Cd)	ug/L	0.017	0.026	6041292	0.025	6043242	0.025	0.010	6041292
Total Calcium (Ca)	ug/L	590	580	6041292	610	6043242	550	100	6041292
Total Chromium (Cr)	ug/L	<1.0	<1.0	6041292	<1.0	6043242	<1.0	1.0	6041292
Total Cobalt (Co)	ug/L	<0.40	<0.40	6041292	<0.40	6043242	<0.40	0.40	6041292
Total Copper (Cu)	ug/L	<0.50	<0.50	6041292	<0.50	6043242	<0.50	0.50	6041292
Total Iron (Fe)	ug/L	170	130	6041292	140	6043242	140	50	6041292
Total Lead (Pb)	ug/L	<0.50	<0.50	6041292	<0.50	6043242	<0.50	0.50	6041292
Total Magnesium (Mg)	ug/L	290	310	6041292	330	6043242	310	100	6041292
Total Manganese (Mn)	ug/L	66	66	6041292	66	6043242	64	2.0	6041292
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Nickel (Ni)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Phosphorus (P)	ug/L	<100	<100	6041292	<100	6043242	<100	100	6041292
Total Potassium (K)	ug/L	260	250	6041292	240	6043242	230	100	6041292
Total Selenium (Se)	ug/L	<1.0	<1.0	6041292	<1.0	6043242	<1.0	1.0	6041292
Total Silver (Ag)	ug/L	<0.10	<0.10	6041292	<0.10	6043242	<0.10	0.10	6041292
Total Sodium (Na)	ug/L	2800	2600	6041292	2800	6043242	2600	100	6041292
Total Strontium (Sr)	ug/L	4.7	4.4	6041292	4.6	6043242	4.6	2.0	6041292
Total Thallium (Tl)	ug/L	<0.10	<0.10	6041292	<0.10	6043242	<0.10	0.10	6041292
Total Tin (Sn)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Titanium (Ti)	ug/L	2.4	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Uranium (U)	ug/L	<0.10	<0.10	6041292	<0.10	6043242	<0.10	0.10	6041292
Total Vanadium (V)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Zirconium (Zr)	ug/L	<2.0	<2.0	6041292	<2.0	6043242	<2.0	2.0	6041292
Total Zinc (Zn)	ug/L	<5.0	<5.0	6041292	<5.0	6043242	<5.0	5.0	6041292
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHL223	JHL224		JHL225	JHL226		
Sampling Date		2019/03/27 09:40	2019/03/27 10:40		2019/03/27 09:50	2019/03/27 10:40		
COC Number		707748-03-01	707748-03-01		707748-03-01	707748-03-01		
	UNITS	SW11	SW12	QC Batch	FIELD/FILTER BLANK	FMS DUP 2	RDL	QC Batch
Metals								
Total Aluminum (Al)	ug/L	130	53	6041292	<5.0	180	5.0	6043242
Total Antimony (Sb)	ug/L	<1.0	<1.0	6041292	<1.0	<1.0	1.0	6043242
Total Arsenic (As)	ug/L	<1.0	<1.0	6041292	<1.0	<1.0	1.0	6043242
Total Barium (Ba)	ug/L	1.3	<1.0	6041292	<1.0	3.9	1.0	6043242
Total Beryllium (Be)	ug/L	<1.0	<1.0	6041292	<1.0	<1.0	1.0	6043242
Total Bismuth (Bi)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Boron (B)	ug/L	<50	<50	6041292	<50	<50	50	6043242
Total Cadmium (Cd)	ug/L	0.010	<0.010	6041292	<0.010	0.020	0.010	6043242
Total Calcium (Ca)	ug/L	270	300	6041292	<100	580	100	6043242
Total Chromium (Cr)	ug/L	<1.0	<1.0	6041292	<1.0	<1.0	1.0	6043242
Total Cobalt (Co)	ug/L	<0.40	<0.40	6041292	<0.40	<0.40	0.40	6043242
Total Copper (Cu)	ug/L	<0.50	<0.50	6041292	<0.50	<0.50	0.50	6043242
Total Iron (Fe)	ug/L	99	53	6041292	<50	170	50	6043242
Total Lead (Pb)	ug/L	<0.50	<0.50	6041292	<0.50	<0.50	0.50	6043242
Total Magnesium (Mg)	ug/L	180	130	6041292	<100	300	100	6043242
Total Manganese (Mn)	ug/L	23	26	6041292	<2.0	67	2.0	6043242
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Nickel (Ni)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Phosphorus (P)	ug/L	<100	<100	6041292	<100	<100	100	6043242
Total Potassium (K)	ug/L	160	190	6041292	<100	240	100	6043242
Total Selenium (Se)	ug/L	<1.0	<1.0	6041292	<1.0	<1.0	1.0	6043242
Total Silver (Ag)	ug/L	<0.10	<0.10	6041292	<0.10	<0.10	0.10	6043242
Total Sodium (Na)	ug/L	1600	1300	6041292	<100	2800	100	6043242
Total Strontium (Sr)	ug/L	2.7	<2.0	6041292	<2.0	4.1	2.0	6043242
Total Thallium (Tl)	ug/L	<0.10	<0.10	6041292	<0.10	<0.10	0.10	6043242
Total Tin (Sn)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Titanium (Ti)	ug/L	<2.0	<2.0	6041292	<2.0	2.7	2.0	6043242
Total Uranium (U)	ug/L	<0.10	<0.10	6041292	<0.10	<0.10	0.10	6043242
Total Vanadium (V)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Zirconium (Zr)	ug/L	<2.0	<2.0	6041292	<2.0	<2.0	2.0	6043242
Total Zinc (Zn)	ug/L	<5.0	<5.0	6041292	<5.0	<5.0	5.0	6043242
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHL228	JHL229	JHL230	JHL231	JHL232	JHL233		
Sampling Date		2019/03/27 08:40	2019/03/27 13:25	2019/03/27 12:30	2019/03/27 11:30	2019/03/27 09:40	2019/03/27 10:40		
COC Number		707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01		
	UNITS	SW6 FF	SW8 FF	SW9 FF	SW10 FF	SW11 FF	SW12 F	RDL	QC Batch

Metals									
Dissolved Aluminum (Al)	ug/L	140	170	180	180	92	56	5.0	6043312
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6043312
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6043312
Dissolved Barium (Ba)	ug/L	3.8	4.8	5.2	5.3	1.1	1.1	1.0	6043312
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6043312
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Boron (B)	ug/L	<50	<50	<50	<50	<50	<50	50	6043312
Dissolved Cadmium (Cd)	ug/L	0.017	0.021	0.026	0.023	<0.010	<0.010	0.010	6043312
Dissolved Calcium (Ca)	ug/L	670	610	620	590	260	320	100	6043312
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.0	6043312
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6043312
Dissolved Copper (Cu)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6043312
Dissolved Iron (Fe)	ug/L	130	110	110	120	71	56	50	6043312
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6043312
Dissolved Magnesium (Mg)	ug/L	290	310	330	320	170	140	100	6043312
Dissolved Manganese (Mn)	ug/L	64	65	64	63	19	28	2.0	6043312
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	<100	100	6043312
Dissolved Potassium (K)	ug/L	250	250	240	230	150	200	100	6043312
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6043312
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6043312
Dissolved Sodium (Na)	ug/L	2800	2600	2800	2600	1500	1200	100	6043312
Dissolved Strontium (Sr)	ug/L	4.8	4.8	4.8	4.6	2.2	2.1	2.0	6043312
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6043312
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Uranium (U)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6043312
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Zirconium (Zr)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6043312
Dissolved Zinc (Zn)	ug/L	<5.0	18	<5.0	5.7	<5.0	<5.0	5.0	6043312

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHL234	JHL235			JHL237		
Sampling Date		2019/03/27 09:50	2019/03/27 10:40			2019/03/27		
COC Number		707748-03-01	707748-03-01			707748-03-01		
	UNITS	FIELD/FILTER FF	FMS DUP 2 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Metals								
Dissolved Aluminum (Al)	ug/L	<5.0	140	5.0	6043312			
Total Aluminum (Al)	ug/L					<5.0	5.0	6043242
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	1.0	6043312			
Total Antimony (Sb)	ug/L					<1.0	1.0	6043242
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	1.0	6043312			
Total Arsenic (As)	ug/L					<1.0	1.0	6043242
Dissolved Barium (Ba)	ug/L	<1.0	3.7	1.0	6043312			
Total Barium (Ba)	ug/L					<1.0	1.0	6043242
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	1.0	6043312			
Total Beryllium (Be)	ug/L					<1.0	1.0	6043242
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	6043312			
Total Bismuth (Bi)	ug/L					<2.0	2.0	6043242
Dissolved Boron (B)	ug/L	<50	<50	50	6043312			
Total Boron (B)	ug/L					<50	50	6043242
Dissolved Cadmium (Cd)	ug/L	<0.010	0.019	0.010	6043312			
Total Cadmium (Cd)	ug/L					<0.010	0.010	6043242
Dissolved Calcium (Ca)	ug/L	<100	610	100	6043312			
Total Calcium (Ca)	ug/L					<100	100	6043242
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	1.0	6043312			
Total Chromium (Cr)	ug/L					<1.0	1.0	6043242
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	0.40	6043312			
Total Cobalt (Co)	ug/L					<0.40	0.40	6043242
Dissolved Copper (Cu)	ug/L	<0.50	<0.50	0.50	6043312			
Total Copper (Cu)	ug/L					<0.50	0.50	6043242
Dissolved Iron (Fe)	ug/L	<50	130	50	6043312			
Total Iron (Fe)	ug/L					<50	50	6043242
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	6043312			
Total Lead (Pb)	ug/L					<0.50	0.50	6043242
Dissolved Magnesium (Mg)	ug/L	<100	280	100	6043312			
Total Magnesium (Mg)	ug/L					<100	100	6043242
Dissolved Manganese (Mn)	ug/L	<2.0	65	2.0	6043312			
Total Manganese (Mn)	ug/L					<2.0	2.0	6043242
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	6043312			
Total Molybdenum (Mo)	ug/L					<2.0	2.0	6043242
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		JHL234	JHL235			JHL237		
Sampling Date		2019/03/27 09:50	2019/03/27 10:40			2019/03/27		
COC Number		707748-03-01	707748-03-01			707748-03-01		
	UNITS	FIELD/FILTER FF	FMS DUP 2 FF	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	2.0	6043312			
Total Nickel (Ni)	ug/L					<2.0	2.0	6043242
Dissolved Phosphorus (P)	ug/L	<100	<100	100	6043312			
Total Phosphorus (P)	ug/L					<100	100	6043242
Dissolved Potassium (K)	ug/L	<100	250	100	6043312			
Total Potassium (K)	ug/L					<100	100	6043242
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	1.0	6043312			
Total Selenium (Se)	ug/L					<1.0	1.0	6043242
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	6043312			
Total Silver (Ag)	ug/L					<0.10	0.10	6043242
Dissolved Sodium (Na)	ug/L	110	2800	100	6043312			
Total Sodium (Na)	ug/L					<100	100	6043242
Dissolved Strontium (Sr)	ug/L	<2.0	4.6	2.0	6043312			
Total Strontium (Sr)	ug/L					<2.0	2.0	6043242
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	0.10	6043312			
Total Thallium (Tl)	ug/L					<0.10	0.10	6043242
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	2.0	6043312			
Total Tin (Sn)	ug/L					<2.0	2.0	6043242
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	2.0	6043312			
Total Titanium (Ti)	ug/L					<2.0	2.0	6043242
Dissolved Uranium (U)	ug/L	<0.10	<0.10	0.10	6043312			
Total Uranium (U)	ug/L					<0.10	0.10	6043242
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	2.0	6043312			
Total Vanadium (V)	ug/L					<2.0	2.0	6043242
Dissolved Zirconium (Zr)	ug/L	<2.0	<2.0	2.0	6043312			
Total Zirconium (Zr)	ug/L					<2.0	2.0	6043242
Dissolved Zinc (Zn)	ug/L	<5.0	5.2	5.0	6043312			
Total Zinc (Zn)	ug/L					<5.0	5.0	6043242
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JHL218	JHL218	JHL219	JHL220	JHL221	JHL223		
Sampling Date		2019/03/27 08:40	2019/03/27 08:40	2019/03/27 13:25	2019/03/27 12:30	2019/03/27 11:30	2019/03/27 09:40		
COC Number		707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01		
	UNITS	SW6	SW6 Lab-Dup	SW8	SW9	SW10	SW11	RDL	QC Batch

Metals									
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6052977
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									

Maxxam ID		JHL224	JHL225	JHL226			JHL228	JHL229		
Sampling Date		2019/03/27 10:40	2019/03/27 09:50	2019/03/27 10:40			2019/03/27 08:40	2019/03/27 13:25		
COC Number		707748-03-01	707748-03-01	707748-03-01			707748-03-01	707748-03-01		
	UNITS	SW12	FIELD/FILTER BLANK	FMS DUP 2	RDL	QC Batch	SW6 FF	SW8 FF	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L						<1.0	<1.0	1.0	6044405
Total Tungsten (W)	ug/L	<1.0	<1.0	<1.0	1.0	6052977				
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

Maxxam ID		JHL230	JHL231	JHL232	JHL233	JHL234	JHL235		
Sampling Date		2019/03/27 12:30	2019/03/27 11:30	2019/03/27 09:40	2019/03/27 10:40	2019/03/27 09:50	2019/03/27 10:40		
COC Number		707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01	707748-03-01		
	UNITS	SW9 FF	SW10 FF	SW11 FF	SW12 F	FIELD/FILTER FF	FMS DUP 2 FF	RDL	QC Batch

Metals										
Dissolved Tungsten (W)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6044405	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.3°C
Package 2	4.0°C
Package 3	2.3°C
Package 4	2.3°C

Sample JHL218 [SW6] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL219 [SW8] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL220 [SW9] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL221 [SW10] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL223 [SW11] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL224 [SW12] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL226 [FMS DUP 2] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL228 [SW6 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL229 [SW8 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL230 [SW9 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL231 [SW10 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL232 [SW11 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL233 [SW12 F] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL234 [FIELD/FILTER FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample JHL235 [FMS DUP 2 FF] : RCap Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6041292	BAN	Matrix Spike	Total Aluminum (Al)	2019/03/29		100	%	80 - 120
			Total Antimony (Sb)	2019/03/29		105	%	80 - 120
			Total Arsenic (As)	2019/03/29		99	%	80 - 120
			Total Barium (Ba)	2019/03/29		NC	%	80 - 120
			Total Beryllium (Be)	2019/03/29		105	%	80 - 120
			Total Bismuth (Bi)	2019/03/29		100	%	80 - 120
			Total Boron (B)	2019/03/29		109	%	80 - 120
			Total Cadmium (Cd)	2019/03/29		99	%	80 - 120
			Total Calcium (Ca)	2019/03/29		NC	%	80 - 120
			Total Chromium (Cr)	2019/03/29		98	%	80 - 120
			Total Cobalt (Co)	2019/03/29		99	%	80 - 120
			Total Copper (Cu)	2019/03/29		NC	%	80 - 120
			Total Iron (Fe)	2019/03/29		101	%	80 - 120
			Total Lead (Pb)	2019/03/29		97	%	80 - 120
			Total Magnesium (Mg)	2019/03/29		103	%	80 - 120
			Total Manganese (Mn)	2019/03/29		98	%	80 - 120
			Total Molybdenum (Mo)	2019/03/29		105	%	80 - 120
			Total Nickel (Ni)	2019/03/29		98	%	80 - 120
			Total Phosphorus (P)	2019/03/29		104	%	80 - 120
			Total Potassium (K)	2019/03/29		103	%	80 - 120
			Total Selenium (Se)	2019/03/29		97	%	80 - 120
			Total Silver (Ag)	2019/03/29		98	%	80 - 120
			Total Sodium (Na)	2019/03/29		99	%	80 - 120
			Total Strontium (Sr)	2019/03/29		NC	%	80 - 120
			Total Thallium (Tl)	2019/03/29		100	%	80 - 120
			Total Tin (Sn)	2019/03/29		102	%	80 - 120
			Total Titanium (Ti)	2019/03/29		99	%	80 - 120
			Total Uranium (U)	2019/03/29		103	%	80 - 120
			Total Vanadium (V)	2019/03/29		99	%	80 - 120
			Total Zirconium (Zr)	2019/03/29		105	%	80 - 120
			Total Zinc (Zn)	2019/03/29		97	%	80 - 120
6041292	BAN	Spiked Blank	Total Aluminum (Al)	2019/03/28		103	%	80 - 120
			Total Antimony (Sb)	2019/03/28		101	%	80 - 120
			Total Arsenic (As)	2019/03/28		97	%	80 - 120
			Total Barium (Ba)	2019/03/28		96	%	80 - 120
			Total Beryllium (Be)	2019/03/28		103	%	80 - 120
			Total Bismuth (Bi)	2019/03/28		103	%	80 - 120
			Total Boron (B)	2019/03/28		107	%	80 - 120
			Total Cadmium (Cd)	2019/03/28		99	%	80 - 120
			Total Calcium (Ca)	2019/03/28		100	%	80 - 120
			Total Chromium (Cr)	2019/03/28		98	%	80 - 120
			Total Cobalt (Co)	2019/03/28		100	%	80 - 120
			Total Copper (Cu)	2019/03/28		98	%	80 - 120
			Total Iron (Fe)	2019/03/28		102	%	80 - 120
			Total Lead (Pb)	2019/03/28		99	%	80 - 120
			Total Magnesium (Mg)	2019/03/28		104	%	80 - 120
			Total Manganese (Mn)	2019/03/28		101	%	80 - 120
			Total Molybdenum (Mo)	2019/03/28		104	%	80 - 120
Total Nickel (Ni)	2019/03/28		97	%	80 - 120			
Total Phosphorus (P)	2019/03/28		104	%	80 - 120			
Total Potassium (K)	2019/03/28		105	%	80 - 120			
Total Selenium (Se)	2019/03/28		98	%	80 - 120			
Total Silver (Ag)	2019/03/28		98	%	80 - 120			
Total Sodium (Na)	2019/03/28		101	%	80 - 120			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Strontium (Sr)	2019/03/28		100	%	80 - 120
			Total Thallium (Tl)	2019/03/28		103	%	80 - 120
			Total Tin (Sn)	2019/03/28		101	%	80 - 120
			Total Titanium (Ti)	2019/03/28		102	%	80 - 120
			Total Uranium (U)	2019/03/28		102	%	80 - 120
			Total Vanadium (V)	2019/03/28		100	%	80 - 120
			Total Zirconium (Zr)	2019/03/28		103	%	80 - 120
			Total Zinc (Zn)	2019/03/28		98	%	80 - 120
6041292	BAN	Method Blank	Total Aluminum (Al)	2019/03/28	<5.0		ug/L	
			Total Antimony (Sb)	2019/03/28	<1.0		ug/L	
			Total Arsenic (As)	2019/03/28	<1.0		ug/L	
			Total Barium (Ba)	2019/03/28	<1.0		ug/L	
			Total Beryllium (Be)	2019/03/28	<1.0		ug/L	
			Total Bismuth (Bi)	2019/03/28	<2.0		ug/L	
			Total Boron (B)	2019/03/28	<50		ug/L	
			Total Cadmium (Cd)	2019/03/28	<0.010		ug/L	
			Total Calcium (Ca)	2019/03/28	<100		ug/L	
			Total Chromium (Cr)	2019/03/28	<1.0		ug/L	
			Total Cobalt (Co)	2019/03/28	<0.40		ug/L	
			Total Copper (Cu)	2019/03/28	<0.50		ug/L	
			Total Iron (Fe)	2019/03/28	<50		ug/L	
			Total Lead (Pb)	2019/03/28	<0.50		ug/L	
			Total Magnesium (Mg)	2019/03/28	<100		ug/L	
			Total Manganese (Mn)	2019/03/28	<2.0		ug/L	
			Total Molybdenum (Mo)	2019/03/28	<2.0		ug/L	
			Total Nickel (Ni)	2019/03/28	<2.0		ug/L	
			Total Phosphorus (P)	2019/03/28	<100		ug/L	
			Total Potassium (K)	2019/03/28	<100		ug/L	
			Total Selenium (Se)	2019/03/28	<1.0		ug/L	
			Total Silver (Ag)	2019/03/28	<0.10		ug/L	
			Total Sodium (Na)	2019/03/28	<100		ug/L	
			Total Strontium (Sr)	2019/03/28	<2.0		ug/L	
			Total Thallium (Tl)	2019/03/28	<0.10		ug/L	
			Total Tin (Sn)	2019/03/28	<2.0		ug/L	
			Total Titanium (Ti)	2019/03/28	<2.0		ug/L	
			Total Uranium (U)	2019/03/28	<0.10		ug/L	
			Total Vanadium (V)	2019/03/28	<2.0		ug/L	
			Total Zirconium (Zr)	2019/03/28	<2.0		ug/L	
			Total Zinc (Zn)	2019/03/28	<5.0		ug/L	
6041292	BAN	RPD	Total Aluminum (Al)	2019/03/29	1.2		%	20
6041306	AM6	QC Standard	Total Suspended Solids	2019/04/04		96	%	80 - 120
6041306	AM6	Method Blank	Total Suspended Solids	2019/04/04	<1.0		mg/L	
6041306	AM6	RPD	Total Suspended Solids	2019/04/04	1.6		%	20
6041474	HM2	Matrix Spike [JHL234-04]	Dissolved Organic Carbon (C)	2019/03/28		107	%	85 - 115
6041474	HM2	Spiked Blank	Dissolved Organic Carbon (C)	2019/03/28		105	%	80 - 120
6041474	HM2	Method Blank	Dissolved Organic Carbon (C)	2019/03/28	<0.5		mg/L	
6041474	HM2	RPD [JHL234-04]	Dissolved Organic Carbon (C)	2019/03/28	NC		%	15
6041511	HM2	Matrix Spike [JHL220-07]	Total Organic Carbon (C)	2019/03/28		100	%	85 - 115
6041511	HM2	Spiked Blank	Total Organic Carbon (C)	2019/03/28		100	%	80 - 120
6041511	HM2	Method Blank	Total Organic Carbon (C)	2019/03/28	<0.50		mg/L	
6041511	HM2	RPD [JHL220-07]	Total Organic Carbon (C)	2019/03/28	0.32		%	15
6043242	BAN	Matrix Spike	Total Aluminum (Al)	2019/03/29		103	%	80 - 120
			Total Antimony (Sb)	2019/03/29		104	%	80 - 120
			Total Arsenic (As)	2019/03/29		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Barium (Ba)	2019/03/29		NC	%	80 - 120
			Total Beryllium (Be)	2019/03/29		103	%	80 - 120
			Total Bismuth (Bi)	2019/03/29		102	%	80 - 120
			Total Boron (B)	2019/03/29		107	%	80 - 120
			Total Cadmium (Cd)	2019/03/29		100	%	80 - 120
			Total Calcium (Ca)	2019/03/29		NC	%	80 - 120
			Total Chromium (Cr)	2019/03/29		96	%	80 - 120
			Total Cobalt (Co)	2019/03/29		97	%	80 - 120
			Total Copper (Cu)	2019/03/29		93	%	80 - 120
			Total Iron (Fe)	2019/03/29		101	%	80 - 120
			Total Lead (Pb)	2019/03/29		99	%	80 - 120
			Total Magnesium (Mg)	2019/03/29		101	%	80 - 120
			Total Manganese (Mn)	2019/03/29		97	%	80 - 120
			Total Molybdenum (Mo)	2019/03/29		105	%	80 - 120
			Total Nickel (Ni)	2019/03/29		96	%	80 - 120
			Total Phosphorus (P)	2019/03/29		107	%	80 - 120
			Total Potassium (K)	2019/03/29		102	%	80 - 120
			Total Selenium (Se)	2019/03/29		99	%	80 - 120
			Total Silver (Ag)	2019/03/29		100	%	80 - 120
			Total Sodium (Na)	2019/03/29		99	%	80 - 120
			Total Strontium (Sr)	2019/03/29		NC	%	80 - 120
			Total Thallium (Tl)	2019/03/29		102	%	80 - 120
			Total Tin (Sn)	2019/03/29		106	%	80 - 120
			Total Titanium (Ti)	2019/03/29		96	%	80 - 120
			Total Uranium (U)	2019/03/29		103	%	80 - 120
			Total Vanadium (V)	2019/03/29		99	%	80 - 120
			Total Zirconium (Zr)	2019/03/29		108	%	80 - 120
			Total Zinc (Zn)	2019/03/29		95	%	80 - 120
6043242	BAN	Spiked Blank	Total Aluminum (Al)	2019/03/29		103	%	80 - 120
			Total Antimony (Sb)	2019/03/29		104	%	80 - 120
			Total Arsenic (As)	2019/03/29		99	%	80 - 120
			Total Barium (Ba)	2019/03/29		101	%	80 - 120
			Total Beryllium (Be)	2019/03/29		107	%	80 - 120
			Total Bismuth (Bi)	2019/03/29		104	%	80 - 120
			Total Boron (B)	2019/03/29		114	%	80 - 120
			Total Cadmium (Cd)	2019/03/29		99	%	80 - 120
			Total Calcium (Ca)	2019/03/29		104	%	80 - 120
			Total Chromium (Cr)	2019/03/29		100	%	80 - 120
			Total Cobalt (Co)	2019/03/29		101	%	80 - 120
			Total Copper (Cu)	2019/03/29		99	%	80 - 120
			Total Iron (Fe)	2019/03/29		104	%	80 - 120
			Total Lead (Pb)	2019/03/29		100	%	80 - 120
			Total Magnesium (Mg)	2019/03/29		109	%	80 - 120
			Total Manganese (Mn)	2019/03/29		100	%	80 - 120
			Total Molybdenum (Mo)	2019/03/29		104	%	80 - 120
			Total Nickel (Ni)	2019/03/29		100	%	80 - 120
			Total Phosphorus (P)	2019/03/29		107	%	80 - 120
			Total Potassium (K)	2019/03/29		105	%	80 - 120
			Total Selenium (Se)	2019/03/29		100	%	80 - 120
			Total Silver (Ag)	2019/03/29		101	%	80 - 120
			Total Sodium (Na)	2019/03/29		104	%	80 - 120
			Total Strontium (Sr)	2019/03/29		99	%	80 - 120
			Total Thallium (Tl)	2019/03/29		103	%	80 - 120
			Total Tin (Sn)	2019/03/29		105	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6043242	BAN	Method Blank	Total Titanium (Ti)	2019/03/29		99	%	80 - 120
			Total Uranium (U)	2019/03/29		102	%	80 - 120
			Total Vanadium (V)	2019/03/29		102	%	80 - 120
			Total Zirconium (Zr)	2019/03/29		103	%	80 - 120
			Total Zinc (Zn)	2019/03/29		98	%	80 - 120
			Total Aluminum (Al)	2019/03/29	<5.0	ug/L		
			Total Antimony (Sb)	2019/03/29	<1.0	ug/L		
			Total Arsenic (As)	2019/03/29	<1.0	ug/L		
			Total Barium (Ba)	2019/03/29	<1.0	ug/L		
			Total Beryllium (Be)	2019/03/29	<1.0	ug/L		
			Total Bismuth (Bi)	2019/03/29	<2.0	ug/L		
			Total Boron (B)	2019/03/29	<50	ug/L		
			Total Cadmium (Cd)	2019/03/29	<0.010	ug/L		
			Total Calcium (Ca)	2019/03/29	<100	ug/L		
			Total Chromium (Cr)	2019/03/29	<1.0	ug/L		
			Total Cobalt (Co)	2019/03/29	<0.40	ug/L		
			Total Copper (Cu)	2019/03/29	<0.50	ug/L		
			Total Iron (Fe)	2019/03/29	<50	ug/L		
			Total Lead (Pb)	2019/03/29	<0.50	ug/L		
			Total Magnesium (Mg)	2019/03/29	<100	ug/L		
			Total Manganese (Mn)	2019/03/29	<2.0	ug/L		
			Total Molybdenum (Mo)	2019/03/29	<2.0	ug/L		
			Total Nickel (Ni)	2019/03/29	<2.0	ug/L		
			Total Phosphorus (P)	2019/03/29	<100	ug/L		
			Total Potassium (K)	2019/03/29	<100	ug/L		
Total Selenium (Se)	2019/03/29	<1.0	ug/L					
Total Silver (Ag)	2019/03/29	<0.10	ug/L					
Total Sodium (Na)	2019/03/29	<100	ug/L					
Total Strontium (Sr)	2019/03/29	<2.0	ug/L					
Total Thallium (Tl)	2019/03/29	<0.10	ug/L					
Total Tin (Sn)	2019/03/29	<2.0	ug/L					
Total Titanium (Ti)	2019/03/29	<2.0	ug/L					
Total Uranium (U)	2019/03/29	<0.10	ug/L					
Total Vanadium (V)	2019/03/29	<2.0	ug/L					
Total Zirconium (Zr)	2019/03/29	<2.0	ug/L					
Total Zinc (Zn)	2019/03/29	<5.0	ug/L					
6043242	BAN	RPD	Total Aluminum (Al)	2019/03/29	0.019		%	20
			Total Antimony (Sb)	2019/03/29	NC		%	20
			Total Arsenic (As)	2019/03/29	NC		%	20
			Total Barium (Ba)	2019/03/29	2.4		%	20
			Total Beryllium (Be)	2019/03/29	NC		%	20
			Total Bismuth (Bi)	2019/03/29	NC		%	20
			Total Boron (B)	2019/03/29	NC		%	20
			Total Cadmium (Cd)	2019/03/29	2.0		%	20
			Total Calcium (Ca)	2019/03/29	1.7		%	20
			Total Chromium (Cr)	2019/03/29	NC		%	20
			Total Cobalt (Co)	2019/03/29	NC		%	20
			Total Copper (Cu)	2019/03/29	1.4		%	20
			Total Iron (Fe)	2019/03/29	7.2		%	20
			Total Lead (Pb)	2019/03/29	2.9		%	20
			Total Magnesium (Mg)	2019/03/29	2.1		%	20
Total Manganese (Mn)	2019/03/29	2.0		%	20			
Total Molybdenum (Mo)	2019/03/29	NC		%	20			
Total Nickel (Ni)	2019/03/29	NC		%	20			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Phosphorus (P)	2019/03/29	NC		%	20
			Total Potassium (K)	2019/03/29	0.79		%	20
			Total Selenium (Se)	2019/03/29	NC		%	20
			Total Silver (Ag)	2019/03/29	NC		%	20
			Total Sodium (Na)	2019/03/29	1.4		%	20
			Total Strontium (Sr)	2019/03/29	2.6		%	20
			Total Thallium (Tl)	2019/03/29	NC		%	20
			Total Tin (Sn)	2019/03/29	6.8		%	20
			Total Titanium (Ti)	2019/03/29	NC		%	20
			Total Uranium (U)	2019/03/29	NC		%	20
			Total Vanadium (V)	2019/03/29	NC		%	20
			Total Zinc (Zn)	2019/03/29	1.6		%	20
6043248	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043248	NHU	RPD	pH	2019/03/29	1.3		%	N/A
6043251	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043251	NHU	Method Blank	Conductivity	2019/03/29	1.0, RDL=1.0		uS/cm	
6043251	NHU	RPD	Conductivity	2019/03/29	0.90		%	10
6043252	NHU	Matrix Spike	Dissolved Fluoride (F-)	2019/03/29		NC	%	80 - 120
6043252	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/03/29		105	%	80 - 120
6043252	NHU	Method Blank	Dissolved Fluoride (F-)	2019/03/29	<0.10		mg/L	
6043252	NHU	RPD	Dissolved Fluoride (F-)	2019/03/29	NC		%	20
6043255	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043255	NHU	RPD	pH	2019/03/29	2.2		%	N/A
6043256	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043256	NHU	Method Blank	Conductivity	2019/03/29	1.1, RDL=1.0		uS/cm	
6043256	NHU	RPD	Conductivity	2019/03/29	0.19		%	10
6043257	NHU	Matrix Spike	Dissolved Fluoride (F-)	2019/03/29		NC	%	80 - 120
6043257	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/03/29		102	%	80 - 120
6043257	NHU	Method Blank	Dissolved Fluoride (F-)	2019/03/29	<0.10		mg/L	
6043257	NHU	RPD	Dissolved Fluoride (F-)	2019/03/29	NC		%	20
6043258	NHU	QC Standard	pH	2019/03/29		101	%	97 - 103
6043258	NHU	RPD	pH	2019/03/29	0.84		%	N/A
6043260	NHU	Spiked Blank	Conductivity	2019/03/29		102	%	80 - 120
6043260	NHU	Method Blank	Conductivity	2019/03/29	1.6, RDL=1.0		uS/cm	
6043260	NHU	RPD	Conductivity	2019/03/29	0.20		%	10
6043274	NHU	QC Standard	Turbidity	2019/03/29		106	%	80 - 120
6043274	NHU	Spiked Blank	Turbidity	2019/03/29		100	%	80 - 120
6043274	NHU	Method Blank	Turbidity	2019/03/29	<0.10		NTU	
6043274	NHU	RPD	Turbidity	2019/03/29	NC		%	20
6043276	NHU	QC Standard	Turbidity	2019/03/29		107	%	80 - 120
6043276	NHU	Spiked Blank	Turbidity	2019/03/29		100	%	80 - 120
6043276	NHU	Method Blank	Turbidity	2019/03/29	<0.10		NTU	
6043276	NHU	RPD	Turbidity	2019/03/29	0		%	20
6043293	HM2	Matrix Spike	Total Organic Carbon (C)	2019/03/29		96	%	85 - 115
6043293	HM2	Spiked Blank	Total Organic Carbon (C)	2019/03/29		101	%	80 - 120
6043293	HM2	Method Blank	Total Organic Carbon (C)	2019/03/29	<0.50		mg/L	
6043293	HM2	RPD	Total Organic Carbon (C)	2019/03/29	2.9		%	15
6043312	BAN	Matrix Spike	Dissolved Aluminum (Al)	2019/04/01		96	%	80 - 120
			Dissolved Antimony (Sb)	2019/04/01		94	%	80 - 120
			Dissolved Arsenic (As)	2019/04/01		95	%	80 - 120
			Dissolved Barium (Ba)	2019/04/01		94	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Beryllium (Be)	2019/04/01		99	%	80 - 120
			Dissolved Bismuth (Bi)	2019/04/01		98	%	80 - 120
			Dissolved Boron (B)	2019/04/01		104	%	80 - 120
			Dissolved Cadmium (Cd)	2019/04/01		98	%	80 - 120
			Dissolved Calcium (Ca)	2019/04/01		NC	%	80 - 120
			Dissolved Chromium (Cr)	2019/04/01		98	%	80 - 120
			Dissolved Cobalt (Co)	2019/04/01		99	%	80 - 120
			Dissolved Copper (Cu)	2019/04/01		97	%	80 - 120
			Dissolved Iron (Fe)	2019/04/01		100	%	80 - 120
			Dissolved Lead (Pb)	2019/04/01		95	%	80 - 120
			Dissolved Magnesium (Mg)	2019/04/01		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/04/01		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/04/01		103	%	80 - 120
			Dissolved Nickel (Ni)	2019/04/01		97	%	80 - 120
			Dissolved Phosphorus (P)	2019/04/01		103	%	80 - 120
			Dissolved Potassium (K)	2019/04/01		102	%	80 - 120
			Dissolved Selenium (Se)	2019/04/01		97	%	80 - 120
			Dissolved Silver (Ag)	2019/04/01		96	%	80 - 120
			Dissolved Sodium (Na)	2019/04/01		100	%	80 - 120
			Dissolved Strontium (Sr)	2019/04/01		NC	%	80 - 120
			Dissolved Thallium (Tl)	2019/04/01		100	%	80 - 120
			Dissolved Tin (Sn)	2019/04/01		101	%	80 - 120
			Dissolved Titanium (Ti)	2019/04/01		102	%	80 - 120
			Dissolved Uranium (U)	2019/04/01		101	%	80 - 120
			Dissolved Vanadium (V)	2019/04/01		100	%	80 - 120
			Dissolved Zirconium (Zr)	2019/04/01		105	%	80 - 120
			Dissolved Zinc (Zn)	2019/04/01		97	%	80 - 120
6043312	BAN	Spiked Blank	Dissolved Aluminum (Al)	2019/04/01		99	%	80 - 120
			Dissolved Antimony (Sb)	2019/04/01		95	%	80 - 120
			Dissolved Arsenic (As)	2019/04/01		95	%	80 - 120
			Dissolved Barium (Ba)	2019/04/01		95	%	80 - 120
			Dissolved Beryllium (Be)	2019/04/01		99	%	80 - 120
			Dissolved Bismuth (Bi)	2019/04/01		101	%	80 - 120
			Dissolved Boron (B)	2019/04/01		103	%	80 - 120
			Dissolved Cadmium (Cd)	2019/04/01		97	%	80 - 120
			Dissolved Calcium (Ca)	2019/04/01		95	%	80 - 120
			Dissolved Chromium (Cr)	2019/04/01		98	%	80 - 120
			Dissolved Cobalt (Co)	2019/04/01		99	%	80 - 120
			Dissolved Copper (Cu)	2019/04/01		98	%	80 - 120
			Dissolved Iron (Fe)	2019/04/01		102	%	80 - 120
			Dissolved Lead (Pb)	2019/04/01		97	%	80 - 120
			Dissolved Magnesium (Mg)	2019/04/01		107	%	80 - 120
			Dissolved Manganese (Mn)	2019/04/01		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2019/04/01		102	%	80 - 120
			Dissolved Nickel (Ni)	2019/04/01		98	%	80 - 120
			Dissolved Phosphorus (P)	2019/04/01		104	%	80 - 120
			Dissolved Potassium (K)	2019/04/01		103	%	80 - 120
			Dissolved Selenium (Se)	2019/04/01		95	%	80 - 120
			Dissolved Silver (Ag)	2019/04/01		96	%	80 - 120
			Dissolved Sodium (Na)	2019/04/01		101	%	80 - 120
			Dissolved Strontium (Sr)	2019/04/01		100	%	80 - 120
			Dissolved Thallium (Tl)	2019/04/01		100	%	80 - 120
			Dissolved Tin (Sn)	2019/04/01		100	%	80 - 120
			Dissolved Titanium (Ti)	2019/04/01		100	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6043312	BAN	Method Blank	Dissolved Uranium (U)	2019/04/01		100	%	80 - 120
			Dissolved Vanadium (V)	2019/04/01		100	%	80 - 120
			Dissolved Zirconium (Zr)	2019/04/01		97	%	80 - 120
			Dissolved Zinc (Zn)	2019/04/01		99	%	80 - 120
			Dissolved Aluminum (Al)	2019/04/01	<5.0		ug/L	
			Dissolved Antimony (Sb)	2019/04/01	<1.0		ug/L	
			Dissolved Arsenic (As)	2019/04/01	<1.0		ug/L	
			Dissolved Barium (Ba)	2019/04/01	<1.0		ug/L	
			Dissolved Beryllium (Be)	2019/04/01	<1.0		ug/L	
			Dissolved Bismuth (Bi)	2019/04/01	<2.0		ug/L	
			Dissolved Boron (B)	2019/04/01	<50		ug/L	
			Dissolved Cadmium (Cd)	2019/04/01	<0.010		ug/L	
			Dissolved Calcium (Ca)	2019/04/01	<100		ug/L	
			Dissolved Chromium (Cr)	2019/04/01	<1.0		ug/L	
			Dissolved Cobalt (Co)	2019/04/01	<0.40		ug/L	
			Dissolved Copper (Cu)	2019/04/01	<0.50		ug/L	
			Dissolved Iron (Fe)	2019/04/01	<50		ug/L	
			Dissolved Lead (Pb)	2019/04/01	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2019/04/01	<100		ug/L	
			Dissolved Manganese (Mn)	2019/04/01	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2019/04/01	<2.0		ug/L	
			Dissolved Nickel (Ni)	2019/04/01	<2.0		ug/L	
			Dissolved Phosphorus (P)	2019/04/01	<100		ug/L	
			Dissolved Potassium (K)	2019/04/01	<100		ug/L	
			Dissolved Selenium (Se)	2019/04/01	<1.0		ug/L	
			Dissolved Silver (Ag)	2019/04/01	<0.10		ug/L	
			Dissolved Sodium (Na)	2019/04/01	<100		ug/L	
Dissolved Strontium (Sr)	2019/04/01	<2.0		ug/L				
Dissolved Thallium (Tl)	2019/04/01	<0.10		ug/L				
Dissolved Tin (Sn)	2019/04/01	<2.0		ug/L				
Dissolved Titanium (Ti)	2019/04/01	<2.0		ug/L				
Dissolved Uranium (U)	2019/04/01	<0.10		ug/L				
Dissolved Vanadium (V)	2019/04/01	<2.0		ug/L				
Dissolved Zirconium (Zr)	2019/04/01	<2.0		ug/L				
Dissolved Zinc (Zn)	2019/04/01	<5.0		ug/L				
6043312	BAN	RPD	Dissolved Aluminum (Al)	2019/04/01	1.2		%	20
			Dissolved Antimony (Sb)	2019/04/01	NC		%	20
			Dissolved Arsenic (As)	2019/04/01	NC		%	20
			Dissolved Barium (Ba)	2019/04/01	0.71		%	20
			Dissolved Beryllium (Be)	2019/04/01	NC		%	20
			Dissolved Bismuth (Bi)	2019/04/01	NC		%	20
			Dissolved Boron (B)	2019/04/01	NC		%	20
			Dissolved Cadmium (Cd)	2019/04/01	7.4		%	20
			Dissolved Calcium (Ca)	2019/04/01	2.8		%	20
			Dissolved Chromium (Cr)	2019/04/01	NC		%	20
			Dissolved Cobalt (Co)	2019/04/01	NC		%	20
			Dissolved Copper (Cu)	2019/04/01	NC		%	20
			Dissolved Iron (Fe)	2019/04/01	NC		%	20
			Dissolved Lead (Pb)	2019/04/01	NC		%	20
			Dissolved Magnesium (Mg)	2019/04/01	0.051		%	20
			Dissolved Manganese (Mn)	2019/04/01	0.41		%	20
			Dissolved Molybdenum (Mo)	2019/04/01	NC		%	20
Dissolved Nickel (Ni)	2019/04/01	NC		%	20			
Dissolved Phosphorus (P)	2019/04/01	NC		%	20			

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Potassium (K)	2019/04/01	2.2		%	20
			Dissolved Selenium (Se)	2019/04/01	NC		%	20
			Dissolved Silver (Ag)	2019/04/01	NC		%	20
			Dissolved Sodium (Na)	2019/04/01	0.25		%	20
			Dissolved Strontium (Sr)	2019/04/01	0.062		%	20
			Dissolved Thallium (Tl)	2019/04/01	NC		%	20
			Dissolved Tin (Sn)	2019/04/01	NC		%	20
			Dissolved Titanium (Ti)	2019/04/01	NC		%	20
			Dissolved Uranium (U)	2019/04/01	1.0		%	20
			Dissolved Vanadium (V)	2019/04/01	NC		%	20
			Dissolved Zinc (Zn)	2019/04/01	NC		%	20
6043378	HM2	Matrix Spike	Total Organic Carbon (C)	2019/03/29		97	%	85 - 115
6043378	HM2	Spiked Blank	Total Organic Carbon (C)	2019/03/29		99	%	80 - 120
6043378	HM2	Method Blank	Total Organic Carbon (C)	2019/03/29	<0.50		mg/L	
6043378	HM2	RPD	Total Organic Carbon (C)	2019/03/29	NC		%	15
6043380	AM6	QC Standard	Total Suspended Solids	2019/04/03		100	%	80 - 120
6043380	AM6	Method Blank	Total Suspended Solids	2019/04/03	<1.0		mg/L	
6043380	AM6	RPD	Total Suspended Solids	2019/04/03	3.6		%	20
6043584	NRG	Matrix Spike [JHL223-03]	Total Alkalinity (Total as CaCO3)	2019/03/29		99	%	80 - 120
6043584	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/29		104	%	80 - 120
6043584	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/29	<5.0		mg/L	
6043584	NRG	RPD [JHL223-03]	Total Alkalinity (Total as CaCO3)	2019/03/29	NC		%	25
6043586	NRG	Matrix Spike [JHL223-03]	Dissolved Chloride (Cl-)	2019/04/01		101	%	80 - 120
6043586	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/01		106	%	80 - 120
6043586	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/01		101	%	80 - 120
6043586	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/01	<1.0		mg/L	
6043586	NRG	RPD [JHL223-03]	Dissolved Chloride (Cl-)	2019/04/01	12		%	25
6043587	NRG	Matrix Spike [JHL223-03]	Dissolved Sulphate (SO4)	2019/04/01		96	%	80 - 120
6043587	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/01		105	%	80 - 120
6043587	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/01	<2.0		mg/L	
6043587	NRG	RPD [JHL223-03]	Dissolved Sulphate (SO4)	2019/04/01	NC		%	25
6043589	NRG	Matrix Spike [JHL223-03]	Reactive Silica (SiO2)	2019/03/29		90	%	80 - 120
6043589	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/03/29		92	%	80 - 120
6043589	NRG	Method Blank	Reactive Silica (SiO2)	2019/03/29	<0.50		mg/L	
6043589	NRG	RPD [JHL223-03]	Reactive Silica (SiO2)	2019/03/29	2.5		%	25
6043590	NRG	Spiked Blank	Colour	2019/03/29		100	%	80 - 120
6043590	NRG	Method Blank	Colour	2019/03/29	<5.0		TCU	
6043590	NRG	RPD [JHL223-03]	Colour	2019/03/29	0.58		%	20
6043592	NRG	Matrix Spike [JHL223-03]	Orthophosphate (P)	2019/04/01		99	%	80 - 120
6043592	NRG	Spiked Blank	Orthophosphate (P)	2019/04/01		107	%	80 - 120
6043592	NRG	Method Blank	Orthophosphate (P)	2019/04/01	<0.010		mg/L	
6043592	NRG	RPD [JHL223-03]	Orthophosphate (P)	2019/04/01	0.69		%	25
6043593	NRG	Matrix Spike [JHL223-03]	Nitrate + Nitrite (N)	2019/03/29		92	%	80 - 120
6043593	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/03/29		99	%	80 - 120
6043593	NRG	Method Blank	Nitrate + Nitrite (N)	2019/03/29	<0.050		mg/L	
6043593	NRG	RPD [JHL223-03]	Nitrate + Nitrite (N)	2019/03/29	9.2		%	25
6043594	NRG	Matrix Spike [JHL223-03]	Nitrite (N)	2019/03/29		91	%	80 - 120
6043594	NRG	Spiked Blank	Nitrite (N)	2019/03/29		96	%	80 - 120
6043594	NRG	Method Blank	Nitrite (N)	2019/03/29	<0.010		mg/L	
6043594	NRG	RPD [JHL223-03]	Nitrite (N)	2019/03/29	NC		%	20
6043602	NRG	Matrix Spike [JHL226-03]	Total Alkalinity (Total as CaCO3)	2019/03/29		98	%	80 - 120
6043602	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/03/29		108	%	80 - 120
6043602	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/03/29	<5.0		mg/L	
6043602	NRG	RPD [JHL226-03]	Total Alkalinity (Total as CaCO3)	2019/03/29	NC		%	25

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6043606	NRG	Matrix Spike [JHL226-03]	Dissolved Chloride (Cl-)	2019/04/01		104	%	80 - 120
6043606	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/01		108	%	80 - 120
6043606	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/01		103	%	80 - 120
6043606	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/01	<1.0		mg/L	
6043606	NRG	RPD [JHL226-03]	Dissolved Chloride (Cl-)	2019/04/01	0.27		%	25
6043607	NRG	Matrix Spike [JHL226-03]	Dissolved Sulphate (SO4)	2019/04/01		108	%	80 - 120
6043607	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/01		99	%	80 - 120
6043607	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/01	<2.0		mg/L	
6043607	NRG	RPD [JHL226-03]	Dissolved Sulphate (SO4)	2019/04/01	NC		%	25
6043608	NRG	Matrix Spike [JHL226-03]	Reactive Silica (SiO2)	2019/03/29		84	%	80 - 120
6043608	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/03/29		93	%	80 - 120
6043608	NRG	Method Blank	Reactive Silica (SiO2)	2019/03/29	<0.50		mg/L	
6043608	NRG	RPD [JHL226-03]	Reactive Silica (SiO2)	2019/03/29	0.61		%	25
6043609	NRG	Spiked Blank	Colour	2019/03/29		99	%	80 - 120
6043609	NRG	Method Blank	Colour	2019/03/29	<5.0		TCU	
6043609	NRG	RPD [JHL226-03]	Colour	2019/03/29	1.7		%	20
6043610	NRG	Matrix Spike [JHL226-03]	Orthophosphate (P)	2019/04/01		100	%	80 - 120
6043610	NRG	Spiked Blank	Orthophosphate (P)	2019/04/01		105	%	80 - 120
6043610	NRG	Method Blank	Orthophosphate (P)	2019/04/01	<0.010		mg/L	
6043610	NRG	RPD [JHL226-03]	Orthophosphate (P)	2019/04/01	NC		%	25
6043611	NRG	Matrix Spike [JHL226-03]	Nitrate + Nitrite (N)	2019/03/29		89	%	80 - 120
6043611	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/03/29		90	%	80 - 120
6043611	NRG	Method Blank	Nitrate + Nitrite (N)	2019/03/29	<0.050		mg/L	
6043611	NRG	RPD [JHL226-03]	Nitrate + Nitrite (N)	2019/03/29	NC		%	25
6043612	NRG	Matrix Spike [JHL226-03]	Nitrite (N)	2019/03/29		85	%	80 - 120
6043612	NRG	Spiked Blank	Nitrite (N)	2019/03/29		96	%	80 - 120
6043612	NRG	Method Blank	Nitrite (N)	2019/03/29	<0.010		mg/L	
6043612	NRG	RPD [JHL226-03]	Nitrite (N)	2019/03/29	NC		%	20
6044405	ADA	Matrix Spike	Dissolved Tungsten (W)	2019/04/02		90	%	80 - 120
6044405	ADA	Spiked Blank	Dissolved Tungsten (W)	2019/04/02		100	%	80 - 120
6044405	ADA	Method Blank	Dissolved Tungsten (W)	2019/04/02	<1.0		ug/L	
6046244	NHU	QC Standard	pH	2019/04/01		101	%	97 - 103
6046244	NHU	RPD [JHL221-03]	pH	2019/04/01	16		%	N/A
6046245	NHU	Spiked Blank	Conductivity	2019/04/01		106	%	80 - 120
6046245	NHU	Method Blank	Conductivity	2019/04/01	1.8, RDL=1.0		uS/cm	
6046245	NHU	RPD [JHL221-03]	Conductivity	2019/04/01	1.9		%	10
6046246	NHU	Matrix Spike	Dissolved Fluoride (F-)	2019/04/01		NC	%	80 - 120
6046246	NHU	Spiked Blank	Dissolved Fluoride (F-)	2019/04/01		103	%	80 - 120
6046246	NHU	Method Blank	Dissolved Fluoride (F-)	2019/04/01	<0.10		mg/L	
6046246	NHU	RPD [JHL221-03]	Dissolved Fluoride (F-)	2019/04/01	NC		%	20
6046291	HM2	QC Standard	Turbidity	2019/04/01		109	%	80 - 120
6046291	HM2	Spiked Blank	Turbidity	2019/04/01		99	%	80 - 120
6046291	HM2	Method Blank	Turbidity	2019/04/01	<0.10		NTU	
6046291	HM2	RPD	Turbidity	2019/04/01	3.6		%	20
6046333	SRM	Matrix Spike [JHL237-08]	Nitrogen (Ammonia Nitrogen)	2019/04/01		99	%	80 - 120
6046333	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01		99	%	80 - 120
6046333	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01	<0.050		mg/L	
6046333	SRM	RPD [JHL237-08]	Nitrogen (Ammonia Nitrogen)	2019/04/01	NC		%	20
6046334	SRM	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/01		94	%	80 - 120
6046334	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01		100	%	80 - 120
6046334	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01	<0.050		mg/L	
6046334	SRM	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/01	NC		%	20
6046344	SRM	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2019/04/01		NC	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6046344	SRM	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01		98	%	80 - 120
6046344	SRM	Method Blank	Nitrogen (Ammonia Nitrogen)	2019/04/01	<0.050		mg/L	
6046344	SRM	RPD	Nitrogen (Ammonia Nitrogen)	2019/04/01	3.5		%	20
6046396	NRG	Matrix Spike	Total Phosphorus	2019/04/02		106	%	N/A
6046396	NRG	Spiked Blank	Total Phosphorus	2019/04/02		93	%	80 - 120
6046396	NRG	Method Blank	Total Phosphorus	2019/04/02	<0.020		mg/L	
6046396	NRG	RPD	Total Phosphorus	2019/04/02	NC		%	25
6046533	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/04/01		106	%	80 - 120
6046533	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/04/01		106	%	80 - 120
6046533	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/04/01	<5.0		mg/L	
6046533	NRG	RPD	Total Alkalinity (Total as CaCO3)	2019/04/01	2.1		%	25
6046545	NRG	Matrix Spike	Dissolved Chloride (Cl-)	2019/04/01		NC	%	80 - 120
6046545	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/01		103	%	80 - 120
6046545	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/01		103	%	80 - 120
6046545	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/01	<1.0		mg/L	
6046545	NRG	RPD	Dissolved Chloride (Cl-)	2019/04/01	0.10		%	25
6046546	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2019/04/01		93	%	80 - 120
6046546	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/01		102	%	80 - 120
6046546	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/01	<2.0		mg/L	
6046546	NRG	RPD	Dissolved Sulphate (SO4)	2019/04/01	0.37		%	25
6046547	NRG	Matrix Spike	Reactive Silica (SiO2)	2019/04/01		97	%	80 - 120
6046547	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/04/01		102	%	80 - 120
6046547	NRG	Method Blank	Reactive Silica (SiO2)	2019/04/01	<0.50		mg/L	
6046547	NRG	RPD	Reactive Silica (SiO2)	2019/04/01	0.65		%	25
6046548	NRG	Spiked Blank	Colour	2019/04/01		103	%	80 - 120
6046548	NRG	Method Blank	Colour	2019/04/01	<5.0		TCU	
6046548	NRG	RPD	Colour	2019/04/01	2.1		%	20
6046549	NRG	Matrix Spike	Orthophosphate (P)	2019/04/01		102	%	80 - 120
6046549	NRG	Spiked Blank	Orthophosphate (P)	2019/04/01		109	%	80 - 120
6046549	NRG	Method Blank	Orthophosphate (P)	2019/04/01	<0.010		mg/L	
6046549	NRG	RPD	Orthophosphate (P)	2019/04/01	NC		%	25
6046550	NRG	Matrix Spike	Nitrate + Nitrite (N)	2019/04/02		98	%	80 - 120
6046550	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/04/02		95	%	80 - 120
6046550	NRG	Method Blank	Nitrate + Nitrite (N)	2019/04/02	<0.050		mg/L	
6046550	NRG	RPD	Nitrate + Nitrite (N)	2019/04/02	1.7		%	25
6046551	NRG	Matrix Spike	Nitrite (N)	2019/04/01		95	%	80 - 120
6046551	NRG	Spiked Blank	Nitrite (N)	2019/04/01		101	%	80 - 120
6046551	NRG	Method Blank	Nitrite (N)	2019/04/01	<0.010		mg/L	
6046551	NRG	RPD	Nitrite (N)	2019/04/01	NC		%	20
6046553	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2019/04/01		NC	%	80 - 120
6046553	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2019/04/01		111	%	80 - 120
6046553	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2019/04/01	<5.0		mg/L	
6046553	NRG	RPD	Total Alkalinity (Total as CaCO3)	2019/04/01	0.21		%	25
6046555	NRG	Matrix Spike	Dissolved Chloride (Cl-)	2019/04/01		102	%	80 - 120
6046555	NRG	QC Standard	Dissolved Chloride (Cl-)	2019/04/01		103	%	80 - 120
6046555	NRG	Spiked Blank	Dissolved Chloride (Cl-)	2019/04/01		102	%	80 - 120
6046555	NRG	Method Blank	Dissolved Chloride (Cl-)	2019/04/01	<1.0		mg/L	
6046555	NRG	RPD	Dissolved Chloride (Cl-)	2019/04/01	1.0		%	25
6046556	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2019/04/01		88	%	80 - 120
6046556	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2019/04/01		99	%	80 - 120
6046556	NRG	Method Blank	Dissolved Sulphate (SO4)	2019/04/01	<2.0		mg/L	
6046556	NRG	RPD	Dissolved Sulphate (SO4)	2019/04/01	5.1		%	25
6046557	NRG	Matrix Spike	Reactive Silica (SiO2)	2019/04/01		98	%	80 - 120
6046557	NRG	Spiked Blank	Reactive Silica (SiO2)	2019/04/01		101	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6046557	NRG	Method Blank	Reactive Silica (SiO2)	2019/04/01	<0.50		mg/L	
6046557	NRG	RPD	Reactive Silica (SiO2)	2019/04/01	0.67		%	25
6046559	NRG	Spiked Blank	Colour	2019/04/01		97	%	80 - 120
6046559	NRG	Method Blank	Colour	2019/04/01	<5.0		TCU	
6046559	NRG	RPD	Colour	2019/04/01	NC		%	20
6046560	NRG	Matrix Spike	Orthophosphate (P)	2019/04/01		102	%	80 - 120
6046560	NRG	Spiked Blank	Orthophosphate (P)	2019/04/01		106	%	80 - 120
6046560	NRG	Method Blank	Orthophosphate (P)	2019/04/01	<0.010		mg/L	
6046560	NRG	RPD	Orthophosphate (P)	2019/04/01	NC		%	25
6046561	NRG	Matrix Spike	Nitrate + Nitrite (N)	2019/04/02		96	%	80 - 120
6046561	NRG	Spiked Blank	Nitrate + Nitrite (N)	2019/04/02		98	%	80 - 120
6046561	NRG	Method Blank	Nitrate + Nitrite (N)	2019/04/02	<0.050		mg/L	
6046561	NRG	RPD	Nitrate + Nitrite (N)	2019/04/02	14		%	25
6046562	NRG	Matrix Spike	Nitrite (N)	2019/04/01		96	%	80 - 120
6046562	NRG	Spiked Blank	Nitrite (N)	2019/04/01		103	%	80 - 120
6046562	NRG	Method Blank	Nitrite (N)	2019/04/01	<0.010		mg/L	
6046562	NRG	RPD	Nitrite (N)	2019/04/01	NC		%	20
6046699	CCR	Matrix Spike	Total Mercury (Hg)	2019/04/02		99	%	80 - 120
6046699	CCR	Spiked Blank	Total Mercury (Hg)	2019/04/02		101	%	80 - 120
6046699	CCR	Method Blank	Total Mercury (Hg)	2019/04/02	<0.013		ug/L	
6046699	CCR	RPD	Total Mercury (Hg)	2019/04/02	NC		%	20
6046858	ZZH	Matrix Spike	Total Chemical Oxygen Demand	2019/04/02		102	%	80 - 120
6046858	ZZH	QC Standard	Total Chemical Oxygen Demand	2019/04/02		104	%	80 - 120
6046858	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2019/04/02		104	%	80 - 120
6046858	ZZH	Method Blank	Total Chemical Oxygen Demand	2019/04/02	<20		mg/L	
6046858	ZZH	RPD	Total Chemical Oxygen Demand	2019/04/02	NC		%	25
6046966	SHC	Spiked Blank	Radium-226	2019/04/10		102	%	85 - 115
6046966	SHC	Method Blank	Radium-226	2019/04/10	<0.010		Bq/L	
6046966	SHC	RPD	Radium-226	2019/04/10	NC		%	N/A
6048242	CCR	Matrix Spike [JHL229-07]	Dissolved Mercury (Hg)	2019/04/03		96	%	80 - 120
6048242	CCR	Spiked Blank	Dissolved Mercury (Hg)	2019/04/03		101	%	80 - 120
6048242	CCR	Method Blank	Dissolved Mercury (Hg)	2019/04/03	<0.013		ug/L	
6048242	CCR	RPD [JHL228-07]	Dissolved Mercury (Hg)	2019/04/03	NC		%	20
6048783	XQI	Matrix Spike [JHL221-11]	Total Cyanide (CN)	2019/04/02		113	%	80 - 120
6048783	XQI	Spiked Blank	Total Cyanide (CN)	2019/04/02		100	%	80 - 120
6048783	XQI	Method Blank	Total Cyanide (CN)	2019/04/02	<0.0050		mg/L	
6048783	XQI	RPD [JHL221-11]	Total Cyanide (CN)	2019/04/02	NC		%	20
6048909	AM6	QC Standard	Total Dissolved Solids	2019/04/03		98	%	80 - 120
6048909	AM6	Method Blank	Total Dissolved Solids	2019/04/03	10, RDL=10 (1)		mg/L	
6048909	AM6	RPD	Total Dissolved Solids	2019/04/03	0		%	25
6050439	BBD	Matrix Spike	Acidity	2019/04/03		94	%	80 - 120
6050439	BBD	Spiked Blank	Acidity	2019/04/03		101	%	80 - 120
6050439	BBD	Method Blank	Acidity	2019/04/03	<5.0		mg/L	
6050439	BBD	RPD	Acidity	2019/04/03	NC		%	25
6050873	BBD	QC Standard	Salinity	2019/04/03		103	%	80 - 120
6050873	BBD	Method Blank	Salinity	2019/04/03	<2.0		N/A	
6050873	BBD	RPD [JHL218-04]	Salinity	2019/04/03	NC		%	25
6052977	TNG	Matrix Spike [JHL218-06]	Total Tungsten (W)	2019/04/04		101	%	80 - 120
6052977	TNG	Spiked Blank	Total Tungsten (W)	2019/04/04		100	%	80 - 120
6052977	TNG	Method Blank	Total Tungsten (W)	2019/04/04	<1.0		ug/L	
6052977	TNG	RPD [JHL218-06]	Total Tungsten (W)	2019/04/04	NC		%	20
6053364	éBP	Spiked Blank	WAD Cyanide (Free)	2019/04/03		92	%	80 - 120
6053364	éBP	Method Blank	WAD Cyanide (Free)	2019/04/03	<0.0030		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	6053364	éBP	RPD [JHL218-12]	WAD Cyanide (Free)	2019/04/03	NC		%	25
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>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)</p> <p>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).</p> <p>(1) Method Blank result high. All other QC acceptable. Sample results confirmed by re-analysis.</p>									

VALIDATION SIGNATURE PAGE

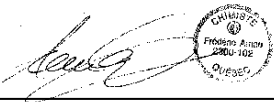
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist



Eric Dearman, Scientific Specialist

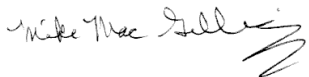


The seal is circular and contains the text: "PROFESOR DE QUÍMICA", "FRANCISCO ALONSO", "2300-102", "OURENSE".

Frederic Arnau, B.Sc., Chemist, Scientific Service Specialist



Gina Thompson, Inorganics General Chemistry Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)



The seal is circular and contains the text: "ASSOCIATION OF THE CHEMICAL PROFESSIONS", "CHARTERED", "STEVEN SIMPSON", "CHEMIST", "ONTARIO".

Steven Simpson, Lab Director

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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