



November 25, 2016

Nova Scotia Lands
45 Wabana Court
Harbourside Commercial Park
Sydney, NS B1P 6H2

ATTENTION: Mr. Frank Potter
Executive Director

*Long Term Maintenance and Monitoring
Semi-Annual Surface Water Quality Monitoring Program July 2016 Final Report*

Surface water quality monitoring has been implemented as part of the long term maintenance and monitoring (LTMM) program to provide ongoing data and compliance commitments to regulatory agencies and/or stakeholders. Nova Scotia Lands Incorporated (NS Lands) is a Crown Corporation of the Province of Nova Scotia responsible for the LTMM semi-annual surface water quality program. NS Lands retained Dillon Consulting Limited (Dillon) to conduct the July 2016 LTMM Surface Water Quality Monitoring Program, the details of which are provided herein.

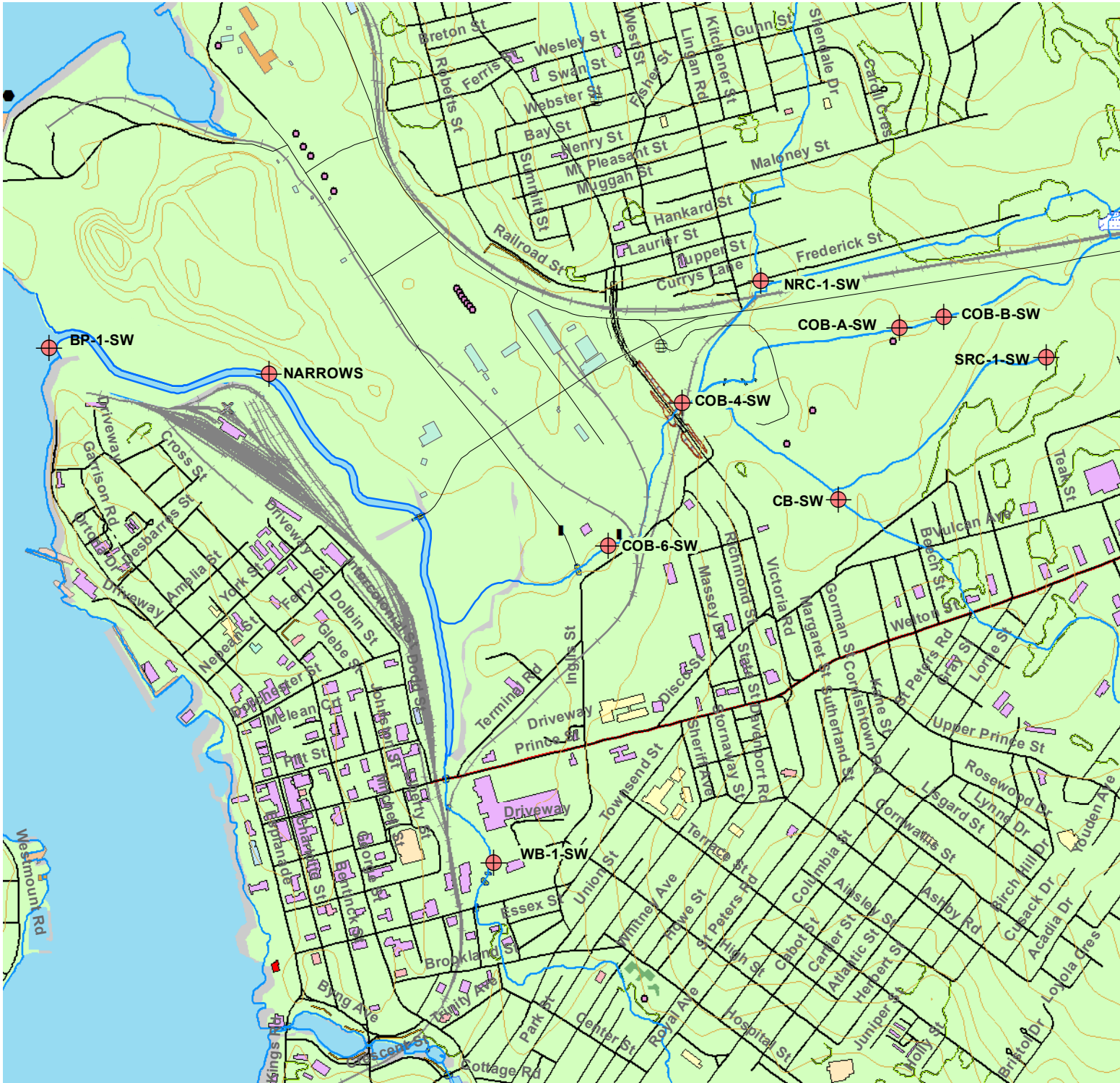
PROJECT METHODOLOGY

The summer Surface Water Quality Monitoring program, which was completed on July 22, 2016, was scheduled to consist of the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) (Figure 1). A GPS unit was used to confirm that the monitoring locations sampled as part of the LTMM Surface Water Quality Monitoring Program were the same as those used during historical surface water monitoring events (e.g., the Environmental Effects Monitoring and Surface Water Monitoring (EEMSWM) Program associated with the Sydney Tar Ponds remediation). Tasks associated with the July 2016 surface water monitoring included:

- Documenting ecological activity in the surface water bodies, if observed;
- Recording of physical conditions and potential contaminants (i.e., debris, precipitate);
- Measurement of field parameters (e.g., pH, conductivity, temperature, salinity and turbidity) with a calibrated Horiba U-22 multi-probe;
- Flow calculation; and,
- Collection of surface water samples for polycyclic aromatic hydrocarbons (PAHs), general chemistry and total metals (including mercury) (RCApMS) analysis. As concentrations of petroleum hydrocarbons (PHC) and polychlorinated biphenyls (PCBs) have remained below laboratory detection limits for the duration of the LTMM program, the July 2016 surface water program was reduced to include PAH and RCapMS analysis only (following approval from Nova Scotia Environment (NSE) and NS Lands).

275
Charlotte Street
Sydney
Nova Scotia
Canada
B1P 1C6

Telephone
(902) 562-9880
Fax
(902) 562-9890



LONG TERM MAINTENANCE
AND MONITORING
SURFACE WATER QUALITY MONITORING PROGRAM
JULY 2016

SURFACE WATER LOCATIONS
FIGURE 1

LEGEND

 Surface Water Locations



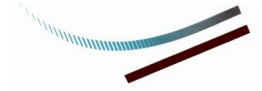
MAP DRAWING INFORMATION:
Province of Nova Scotia Mapping

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

FILE LOCATION: \\DILLON.CA\DILLON_DFS\SYDNEY
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PROJECT: 14-1360
STATUS: FINAL
DATE: 17/08/16



A summary of the surface water stations included in the July 2016 monitoring program is presented in Table 1.

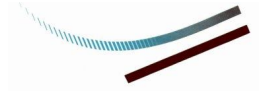
Table 1 – Surface Water Quality Monitoring Stations

Monitoring Station ID	Water Body	Rationale for Sampling
CB-SW	Cagney Brook	To characterize surface water quality within the urban area of Sydney upstream of CO7/CO8 ⁵ .
NRC-1-SW	North Realigned Channel	To characterize surface water quality within the urban area of Whitney Pier upstream of CO7/CO8.
SRC-1-SW	South Realigned Channel	To characterize surface water quality related to runoff from the municipal landfill upstream of CO7/CO8.
COB-A-SW	Coke Ovens Brook - concrete riffles upstream of Stable Drive	To characterize surface water quality from runoff and leachate associated with the municipal landfill upstream of CO1 ³ , CO6 ⁴ and CO7/CO8.
COB-B-SW ²	Coke Oven Brook along SPAR Road, east of COB-A-SW	To further characterize the potential for impacts from the municipal landfill to COB-A-SW.
COB-4-SW	COB-A-SW	To characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B.
COB-6-SW	Coke Ovens Brook	To further characterize surface water quality from the upstream areas of CO1, CO6 and CO7/CO8. This sampling location is also upstream of TP6B.
WB-1-SW	Coke Ovens Brook	To characterize surface water quality within the urban area of Sydney upstream of TP6B ⁶ and TP7 ⁷ .
NARROWS	Wash Brook	To characterize surface water quality downgradient of the majority of the remediation sites.
BP-1-SW ¹	North Channel, Open Hearth Park	To further characterize surface water quality downgradient of the remediation sites and as it discharges to Sydney Harbour.

Notes:

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

Field data was recorded on site specific data sheets. Stream flow measurements were calculated by measuring the width of the stream at the sampling location and by measuring the depth of the stream at ¼, ½ and ¾ width intervals. The stream flow velocity was also measured at ¼, ½ and ¾ intervals. Using a spreadsheet formula, the



approximate stream flow was calculated for each monitoring station. Due to the depth of surface water station BP-1-SW, it was not possible to obtain field measurements across the entire stream width. Dillon personnel collected as much field data at this deeper location as safely possible (i.e., from the stream banks/shoreline). Stream flow velocity for this location was calculated using the Muggah Creek North Channel Survey (CBCL Limited, October 2014) provided by NS Lands.

Sample containers were pre-labelled by the laboratory with the sample identification, analysis required and the project number. The date and time of sample collection were noted on the sample containers in the field at the time of collection. New nitrile gloves were worn by field staff for each sample to avoid cross-contamination between sampling stations. Samples were collected by opening the container facing upstream. Where samples were collected directly into the sample bottles containing preservative, the container was not fully submerged during sampling to avoid washing the preservative out of the container. Metals sample bottles contained nitric acid preservative to ensure that the metals remained in solution.

WEATHER CONDITIONS

Weather information obtained from Environment Canada's climate station at the Sydney Airport indicates that accumulated precipitation for the month of July 2016 was approximately 101 millimeters (mm) of rain. Over half of the July 2016 amount of precipitation (64 mm of rain) occurred before the date of the surface water sampling event (i.e., July 22, 2016). No significant rainfall was recorded on the day of or the four days leading up to the sampling event.

FIELD OBSERVATIONS AND MEASUREMENTS

Observations at the ten surface water stations during the July 2016 monitoring program are summarized in Table 2. Field measurements are summarized in Table 3.

Table 2 – July 2016 Surface Water Quality Monitoring Station Field Observations

Monitoring Station ID	Field Observations	Corresponding Photograph Number
CB-SW	Debris (i.e., plastic) observed on brook banks.	1
NRC-1-SW	Debris (i.e., Styrofoam, concrete, cloth, plastic, cardboard and paper) observed in the channel and on the channel banks.	2
SRC-1-SW	Algae observed in the channel. Concrete channel walls had extensive spray painted graffiti visibly dissolving at the high water point. Debris (e.g., plastic and metal) observed in the channel.	3
COB-A-SW	Stagnant/standing water, no flow. Debris (i.e., metal and plastic) observed on brook banks. Algae observed on brook rocks. Frogs observed on brook bottom.	4
COB-B-SW	Stagnant/standing water, no flow. Algae observed on brook rocks.	5

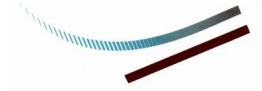


Table 2 – July 2016 Surface Water Quality Monitoring Station Field Observations

Monitoring Station ID	Field Observations	Corresponding Photograph Number
COB-4-SW	Debris (i.e., plastic and metal) observed on brook banks. Visible orange staining observed on the brook banks at the high water level point. Algae observed on brook rocks.	6
COB-6-SW	Debris (i.e., Styrofoam) observed within the brook. Algae observed on brook rocks.	7
WB-1-SW	Debris (i.e., metal, paper, cardboard and concrete) observed within the brook and on the brook banks. Minnows observed swimming in the brook. The water level was approximately 0.5 m higher than observed during previous LTMM surface water monitoring events. The higher water level may be attributed to tidal flushing.	8
NARROWS	Algae observed within the channel. Debris (i.e., plastic) observed on the channel banks. Algae observed on channel rocks.	9
BP-1-SW	Debris (i.e., glass, metal and plastic) observed on the rock banks. Algae, seaweed, snails and barnacles observed on exposed shoreline rocks. Seabirds visible in water and on shoreline.	10

Note:
 Photographs are presented in Appendix A.

Table 3 – July 2016 Surface Water Quality Monitoring Station Field Measurements

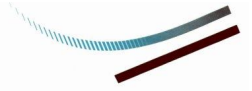
Monitoring Station ID	pH	Turbidity (NTU)	Conductivity (mS/cm)	Salinity (%)	Stream Flow 1 (m ³ /s)
CB-SW	8.44	3.2	0.306	0	0.012
NRC-1-SW	8.84	1.6	0.217	0	0.018
SRC-1-SW	6.95	6.6	0.069	0	0.096
COB-A-SW	Stagnant/Standing Water - No Flow				
COB-B-SW	Stagnant/Standing Water - No Flow				
COB-4-SW	8.10	0.9	0.515	0	0.048
COB-6-SW	8.96	3.3	0.541	0	0.232
WB-1-SW	8.02	4.6	0.166	0	0.469
NARROWS	7.04	7.6	68.3	1.2	2.42 ³
BP-1-SW ²	8.34	6.9	71.8	1.6	2.98 ³

Notes:

1 Stream flow is an approximate calculated value.

2 Collected during low tide conditions.

3 As surface water stations Narrows and BP-1-SW were monitored at different times of the day, there is some difference in the calculated flow rates due to tidal fluctuation. Both locations were monitored during low tide.



REGULATORY FRAME WORK

As specified in Section 4.2, page 21 of the NS Lands LTMM Plan, the remedial criteria used for eight of the ten surface water stations included in the LTMM monitoring program (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW and WB-1-SW) were the Nova Scotia Contaminated Sites Regulations (NS CSRs) Tier I Environmental Quality Standards (EQS) (which came into effect July 6, 2013) for surface water (fresh water) and the Canadian Council of Ministers of the Environment (CCME) for the protection of fresh water aquatic life (FWAL), 2016. Analytical results for the remaining two surface water stations included in the monitoring program (i.e., Narrows and BP-1-SW) were compared to the NS CSRs Tier I EQS for surface water (marine) and the CCME guidelines for the protection of aquatic life (marine).

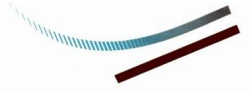
Additionally, as specified in Section 4.2, page 21 of the NS Lands LTMM Plan, analytical results for surface water samples collected at the upstream sampling stations were compared to previously calculated 95% upper confidence limits (UCL) of available Pre-Construction/Baseline analytical data from the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

SURFACE WATER QUALITY TREND ANALYSIS – MANN KENDALL

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

Based on a review of the analytical results from the 2016 monitoring event and historical monitoring events, select parameters, with concentrations above (or historically above) applicable guidelines were selected for Mann-Kendall analysis. These include PAH indicator parameters anthracene, pyrene and benzo(a)pyrene and inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate and zinc.

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



SURFACE WATER RESULTS

The surface water quality results for the July 2016 event, and available post-remediation surface water data, are presented in the attached Tables B-1 and B-2 in Appendix B. As stated above, surface water samples were analyzed for PAHs and RCapMS. Samples were delivered to Maxxam Analytics in Sydney, Nova Scotia (Maxxam) who are contracted directly by NS Lands to conduct the sample analysis. Maxxam is a Canadian Association for Laboratory Accreditation (CALA) certified laboratory for the parameters analyzed. Review of the data indicates:

PAH results:

- o The anthracene concentration of 0.021 ug/L in NRC-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 0.012 ug/L;
- o Benzo(a)pyrene concentration of 0.025 ug/L in WB-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 0.015 ug/L;
- o Fluoranthene concentration of 0.16 ug/L in WB-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 0.04 ug/L; and,
- o Pyrene concentration of 0.092 ug/L in WB-1-SW exceeded the Tier I EQS (fresh water) and CCME FWAL guideline of 0.025 ug/L.

The remaining PAH parameters analyzed were below criteria. A summary of concentrations of select organic parameters (i.e., PAHs) at each station recorded during the July 2016 event relative to the calculated 95% UCLs is provided in Table 4.

General chemistry and metals results:

- o Concentrations of aluminum ranging from 31 ug/L to 87 ug/L exceed the Tier I EQS (fresh water) standard of 5 ug/L in CB-SW, NRC-1-SW, SRC-1-SW, COB-4-SW, COB-6-SW and WB-1-SW;
- o The arsenic concentration of 1.9 ug/L in SRC-1-SW is above the Upstream Calculated 95% UCL of 1.6 ug/L;
- o The boron concentrations of 3600 ug/L and 3500 ug/L in BP-1-SW and the Narrows exceeded the Tier I EQS (marine water) standard of 1200 ug/L;
- o Concentrations of cadmium ranging from 0.016 ug/L to 0.035 ug/L at NRC-1-SW, SRC-1-SW and WB-1-SW exceed the Tier I EQS (fresh water) standard of 0.01 ug/L;
- o Iron concentrations ranging from 310 ug/L to 970 ug/L in CB-SW, NRC-1-SW, SRC-1-SW, COB-4-SW and WB-1-SW exceed the Tier I EQS (fresh water) and CCME FWAL guideline of 300 ug/L;
- o Manganese concentrations of 71 ug/L and 120 ug/L at BP-1-SW and the Narrows, respectively, are above the Battery Point/Narrows Calculated 95% UCL;

Table 4 - Summary of Organic Surface Water Indicator Parameter Concentrations relative to Calculated 95% (ug/L)

Parameter	Pre-Construction/ Baseline Calculated 95% UCL ¹	Date	Sample Location									
			CB-SW	NRC-1-SW	SRC-1-SW	COB-A-SW	COB-B-SW ²	COB-4-SW	COB-6-SW	WE-1-SW	NARROWS	BP-1-SW
Naphthalene	1.8	12/22/2014	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	0.22	<0.20
		7/27/2015	<0.20	<0.20	<0.20	NS	NS	<0.20	<0.20	<0.20	<0.20	<0.20
		11/18/2015	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
		7/22/2016	<0.20	<0.20	<0.20	NS	NS	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.05	12/22/2014	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010
		7/27/2015	<0.010	<0.010	<0.010	NS	NS	<0.010	<0.010	<0.010	<0.010	<0.010
		11/18/2015	<0.010	0.068	<0.010	<0.010	<0.010	0.39	0.015	<0.010	<0.010	<0.010
		7/22/2016	<0.010	<0.010	<0.010	NS	NS	<0.010	<0.010	0.025	<0.010	<0.010

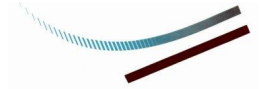
Notes:

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

²Added to the program in July 2015

NS indicates that the surface water station was not sampled as it was either dry or had stagnant/standing water with no flow

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



- o Concentrations of strontium ranging from 160 ug/L to 1,300 ug/L are above the Upstream 95% UCL of 132 ug/L at CB-SW, SRC-1-SW, COB-4-SW, COB-6-SW and WB-1-SW. The concentrations at COB-4-SW, COB-6-SW and WB-1-SW also exceed the Pre-Construction/Baseline 95% UCL of 210 ug/L;
- o Sulphate concentrations ranging from 51 ug/L to 410 ug/L at SRC-1-SW, COB-4-SW, COB-6-SW and WB-1-SW exceed the Upstream Calculated 95% UCL. The concentration of 410 ug/L at WB-1-SW also exceeds the Pre-Construction/Baseline Calculated 95% UCL; and,
- o The chloride concentration of 2900 mg/L at WB-1-SW exceeded the CCME (FWAL) guideline of 120 mg/L.

The remaining general chemistry parameters were below applicable criteria. Table 5 provides a summary of concentrations for select inorganic parameters from the July 2016 sampling event relative to the calculated 95% UCLs.

TREND ANALYSIS

The groundwater quality trend analysis for the 2016 monitoring event was based on the available analytical results (i.e., four rounds of sampling events are required) for select parameters, including PAH indicator parameters anthracene, pyrene and benzo(a)pyrene and inorganic chemistry indicator parameters boron, cadmium, strontium, sulphate and zinc. Concentrations of boron and sulphate at surface water station WB-1-SW showed a fluctuating trend. Trend analysis results for the remaining parameters and surface water stations indicated fluctuations with no trend or a generally declining trend.

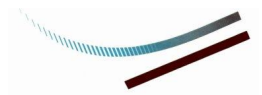
QUALITY CONTROL PROCESS

One field duplicate of sample, COB-4-SW, and one trip blank were collected during the July 2016 monitoring event. The relative percent difference (RPD) was calculated between the sample and associated field duplicate results. The RPD was not calculated for those parameters where one or both of the results associated with the original and/or field duplicate sample exhibited concentrations less than five times the laboratory reportable detection limit (RDL). The calculated RPDs were within established limits (i.e., less than 30% RPD) for each parameter with the exception of %ion balance and aluminum. PAH compounds were not detected in the trip blank. There were no holding time exceedances.

The laboratory analytical certificates have been reviewed for quality assurance/quality control purposes. The laboratory completed quality control analysis including duplicates, blanks, spikes, surrogate recoveries and spiked blanks to assess accuracy and precision as well as the potential for bias, contamination and degradation or matrix effects. No issues were found with the laboratory quality control reports.

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs												
Sample Location	Date	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
Units		(mg/L)	(ug/L)									
Upstream Calculated 95% UCL ¹		26	220	1.6	0.1	8.3	-	3,318	1.2	583	1.9	132
Pre-Construction/Baseline Calculated 95% UCL ¹		84	-	1.98	-	-	1.3	1,900	-	800	-	210
CB-SW	12/22/2014	26	110	<1.0	0.018	<1.0	<0.40	290	<0.50	190	<1.0	130
	7/27/2015	16	28	<1.0	<0.010	<1.0	<0.40	260	<0.50	61	<1.0	320
	11/18/2015	24	130	<1.0	0.011	<1.0	<0.40	280	<0.50	140	<1.0	140
	7/22/2016	10	55	1.4	<0.010	<1.0	<0.40	640	<0.50	71	<1.0	160
NRC-1-SW	12/22/2014	20	58	<1.0	0.022	<1.0	<0.40	150	<0.50	85	<1.0	32
	7/27/2015	22	45	<1.0	0.019	<1.0	<0.40	1,300	<0.50	75	<1.0	54
	11/18/2015	15	1,500	3.5	0.14	1.9	1.5	3,800	9.5	1,100	<1.0	36
	7/22/2016	15	31	<1.0	0.016	<1.0	<0.40	970	0.61	47	<1.0	52
SRC-1-SW	12/22/2014	54	290	<1.0	0.035	<1.0	<0.40	340	1.2	190	<1.0	150
	7/27/2015	47	51	1.0	0.013	<1.0	<0.40	210	1.1	260	<1.0	150
	11/18/2015	43	240	<1.0	0.023	1.2	<0.40	310	0.75	230	<1.0	150
	7/22/2016	51	50	1.9	0.018	<1.0	<0.40	350	<0.50	350	<1.0	170
COB-A-SW	12/22/2014	160	16	<1.0	<0.010	<1.0	<0.40	51	<0.50	25	<1.0	260
	7/27/2015						NS					
	11/18/2015	170	5.1	<1.0	<0.010	<1.0	<0.40	82	<0.50	74	<1.0	260
	7/22/2016						NS					
COB-B-SW ²	7/27/2015						NS					
	11/18/2015	190	7.9	<1.0	<0.010	<1.0	<0.40	<50	<0.50	21	<1.0	250
	7/22/2016						NS					
COB-4-SW	12/22/2014	47	82	<1.0	0.014	<1.0	<0.40	210	<0.50	95	<1.0	140
	7/27/2015	100	51	<1.0	<0.010	<1.0	<0.40	460	<0.50	110	<1.0	250
	11/18/2015	41	7,100	13	0.29	8.0	4.6	14,000	37	1,500	<1.0	150
	7/22/2016	74	28	<1.0	<0.010	<1.0	<0.40	300	<0.50	140	<1.0	270
COB-6-SW	12/22/2014	56	61	<1.0	0.01	<1.0	<0.40	170	<0.50	56	<1.0	180
	7/27/2015	91	39	<1.0	<0.010	<1.0	<0.40	160	<0.50	23	<1.0	300
	11/18/2015	44	220	<1.0	0.018	<1.0	<0.40	490	1.5	79	<1.0	180
	7/22/2016	64	46	1.0	<0.010	<1.0	<0.40	180	<0.50	37	<1.0	300
WB-1-SW	12/22/2014	7.9	160	<1.0	0.038	<1.0	<0.40	270	0.71	95	<1.0	53
	7/27/2015	10	89	<1.0	0.012	<1.0	<0.40	480	<0.50	41	<1.0	100
	11/18/2015	8.3	63	<1.0	<0.010	<1.0	<0.40	200	<0.50	43	<1.0	73
	7/22/2016	410	87	<1.0	0.035	<1.0	<0.40	590	0.56	160	<1.0	1300
Battery Point/ Narrows Calculated 95% UCL ¹		2,180	-	-	-	-	0.9	190	-	70	-	7,000
NARROWS	12/22/2014	270	110	<1.0	0.027	<1.0	<0.40	250	<0.50	63	<1.0	610
	7/27/2015	1,500	86	<1.0	<0.10	<1.0	<4.0	<500	<5.0	100	<1.0	5,400
	11/18/2015	110	76	<1.0	0.012	<1.0	<0.40	320	<0.50	45	<1.0	370
	7/22/2016	1,400	51	<1.0	<0.10	<1.0	<4.0	<500	<5.0	120	<1.0	5,400
BP-1-SW	12/22/2014	170	110	<1.0	0.028	<1.0	<0.40	240	<0.50	61	<1.0	950
	7/27/2015	1,300	140	<1.0	<0.10	<1.0	<4.0	<500	<5.0	59	<1.0	5,300
	11/18/2015	190	140	<1.0	0.014	<1.0	<0.40	410	<0.50	57	<1.0	580
	7/22/2016	1,600	63	<1.0	<0.10	<1.0	<4.0	<500	<5.0	71	<1.0	5,500

Notes:
¹Upstream, Pre-Construction/Baseline and Battery Point/Narrows Calculated 95% UCLs are from the EEMSWCM Program
²Added to the program in July 2015
NS indicates that the surface water station was not sampled as it was either dry or had stagnant/standing water with no flow
Bold indicates the concentration exceeds the Upstream Calculated 95% UCL
Underline indicates exceedance of the Pre-Construction/Baseline Calculated 95% UCL
Italics Bold indicates exceedance of the Battery Point/Narrows Calculated 95% UCL
Italics indicates that the laboratory detection limit is greater than the comparison criteria



SUMMARY

Analytical results of the July 2016 surface water monitoring program indicate that concentrations of the majority of the analyzed parameters are below the applicable criteria and respective 95% UCLs. Criteria and 95% UCL exceedances are summarized in Table 6.

Table 6 Summary of Surface Water Station Criteria and 95 % UCL Exceedances July 2016

Parameter	Location (Criteria and/or 95% UCL Exceedance)
Anthracene	<ul style="list-style-type: none"> • NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Benzo(a)anthracene	<ul style="list-style-type: none"> • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Benzo(a)pyrene	<ul style="list-style-type: none"> • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Fluoranthene	<ul style="list-style-type: none"> • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Pyrene	<ul style="list-style-type: none"> • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Aluminum	<ul style="list-style-type: none"> • CB-SW (Tier I EQS (fresh water) and CCME FWAL) • NRC-1-SW (Tier I EQS (fresh water)) • SRC-1-SW (Tier I EQS (fresh water)) • COB-4-SW (Tier I EQS (fresh water)) • COB-6-SW (Tier I EQS (fresh water) and CCME FWAL) • WB-1-SW (Tier I EQS (fresh water))
Arsenic	<ul style="list-style-type: none"> • SRC-1-SW (Upstream Calculated 95% UCL)
Boron	<ul style="list-style-type: none"> • BP-1-SW (Tier I EQS (marine water)) • Narrows (Tier I EQS (marine water))
Cadmium	<ul style="list-style-type: none"> • NRC-1-SW (Tier I EQS (fresh water)) • SRC-1-SW (Tier I EQS (fresh water)) • WB-1-SW (Tier I EQS (fresh water))
Chloride	<ul style="list-style-type: none"> • WB-1-SW (CCME FWAL)
Iron	<ul style="list-style-type: none"> • CB-1-SW (Tier I EQS (fresh water) and CCME FWAL) • NRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • SRC-1-SW (Tier I EQS (fresh water) and CCME FWAL) • COB-4-SW (Tier I EQS (fresh water) and CCME FWAL) • WB-1-SW (Tier I EQS (fresh water) and CCME FWAL)
Manganese	<ul style="list-style-type: none"> • BP-1-SW (Battery Point Calculated 95%) • Narrows (Battery Point Calculated 95%)

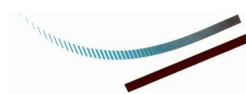


Table 6 Summary of Surface Water Station Criteria and 95 % UCL Exceedances July 2016

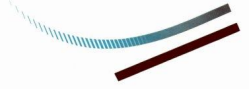
Parameter	Location (Criteria and/or 95% UCL Exceedance)
Strontium	<ul style="list-style-type: none"> • CB-SW (Upstream 95% UCL) • SRC-1-SW (Upstream 95% UCL) • COB-4-SW (Upstream 95% UCL and Pre-Construction/Baseline 95% UCL) • COB-6-SW (Upstream 95% UCL and Pre-Construction/Baseline 95% UCL) • WB-1-SW (Upstream 95% UCL and Pre-Construction/Baseline 95% UCL)
Sulphate	<ul style="list-style-type: none"> • SRC-1-SW (Upstream 95% UCL) • COB-4-SW (Upstream 95% UCL) • COB-6-SW (Upstream 95% UCL) • WB-1-SW (Upstream Calculated 95% UCL and Pre-Construction/Baseline Calculated 95% UCL)

The PAH exceedances (i.e., benzo(a)pyrene, fluoranthene and pyrene) observed in WB-1-SW during the July 2016 monitoring program were the first PAH exceedances reported for this surface water station since the LTMM program commenced in December 2014. Additionally, the significant increases of cadmium, chloride, strontium and sulphate at WB-1-SW are the first exceedances, and the highest concentrations, of these parameters observed since July 2013 (pre-LTMM). The increased concentrations at surface water station WB-1-SW may be attributed to tidal flushing. During the field program, the water level at WB-1-SW was observed to be approximately 0.5 m higher than that recorded during previous LTMM monitoring events. Concentrations of anthracene at NRC-1-SW have been elevated (i.e., above criteria) since the November 2015 monitoring program. Prior to November 2015, the anthracene concentration at NRC-1-SW was below laboratory detection limits.

HARBOURSIDE EAST (HE) TREATMENT PLANT DISCHARGE DATA

At the request of NS Lands, Dillon undertook a preliminary review of the HE treatment plant discharge data in comparison to the LTMM surface water station data. The preliminary review was undertaken to evaluate if there is apparent variability resulting in an improvement of down gradient surface water bodies included in the LTMM sampling program.

Review of the data indicates that surface water chemical parameter concentrations across the site are relatively consistent in that the concentrations are generally low (typical of fresh water), have similar parameters detected, contain a significant amount of variability due to the low concentrations (laboratory variability is highest at low concentrations) and the potential influence of sediment (each of the surface water



sample locations have variable iron, aluminum, and to a lesser extent zinc concentrations that have varied by as much as an order of magnitude during the monitoring period of 2013 to 2016, which is indicative of suspended sediment influence). It is also noted that there are potential tidal influences evident at the WB-1-SW, BP-1-SW and Narrows locations, as indicated by the elevated chloride, sulphate and total dissolved solids (TDS) observed at these locations.

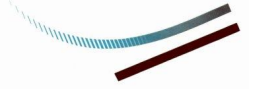
The chemical composition of the effluent from the treatment plant in July 2016 is chemically similar to the surface water samples for the metals parameters with detectable concentrations in the effluent (i.e., aluminum, zinc) and, like the surface water locations, the effluent has no detectable concentrations of PCBs or PHCs. The majority of trace metals were either non-detect before treatment or were reduced to not detectable concentrations post treatment and as such cannot be compared to the surface water concentrations. Although the effluent samples do not include the analysis of as many general chemistry parameters (i.e., effluent results did not include chloride, sulphate, alkalinity, nitrate, phosphate, sodium potassium, calcium, magnesium etc.), the pH and hardness are chemically similar to the pH and hardness of the surface water samples, with the exception of tidally influenced WB-1-SW, BP-1-SW, and Narrows locations (see Table B-3 in Appendix B).

Given the generally low concentrations, consistent chemical character and high degree of variability associated with the surface water samples (many parameters being below detection), it is not possible to determine, with any significance, whether or not the changes in the treatment plant operation, and resulting effluent, is having any measureable impact on the surface waters. The effluent is too similar in chemical character for detectable parameters to the surface water and the high degree of variability present in the low concentrations of most parameters mask any potential differences that may exist.

Review of previous results indicates similar degrees of fluctuation, detectable parameters and low concentrations. Further comparison of effluent quality to surface water quality would unlikely result in any measureable differences beyond the inherent laboratory fluctuations at low concentrations and sediment influence; therefore, no further assessment is recommended.

RECOMMENDATIONS

The next surface water monitoring event will be conducted in the fall (i.e., November 2016). It is recommended that Fall 2016 sampling program include the collection of surface water samples at ten stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-B-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) for PAH and RCapMS analysis.



DISCLAIMER

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

CLOSING

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

Yours truly,

DILLON CONSULTING LIMITED

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

NJW:kme
Our File: 14-1360-1001

Attachments

APPENDIX A
SITE PHOTOGRAPHS



PHOTO 1: View of CB-SW looking northwest.



PHOTO 2: View of NRC-1-SW looking southeast.



PHOTO 3: View of SRC-1-SW looking northeast.



PHOTO 4: View of COB-A-SW looking northwest. Stagnant water visible.



PHOTO 5: View of COB-B-SW looking northeast.



PHOTO 6: View of COB-4-SW looking northwest.



PHOTO 7: View of COB-6-SW looking southwest.



PHOTO 8: View of WB-1-SW looking southwest.



PHOTO 9: View of NARROWS looking southeast.



PHOTO 10: View of BP-1-SW looking northwest.

APPENDIX B
TABLES B-1, B-2 AND B-3

TABLE B-1
SURFACE WATER ANALYTICAL RESULTS - PAHs
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NSE Tier 1 EQS Fresh Water ¹		5.8	4.6	0.012	0.018	0.015	0.48	0.17	-	0.48	1.4	0.26	0.04	3	0.21	2	2	1.1	-	0.4	0.025
CCME FWAL ²		5.8	-	0.012	0.018	0.015	-	-	-	-	-	-	0.04	3	-	-	-	1.1	-	0.4	0.025
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-
CB-SW	07/23/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12/22/14	0.049	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.028	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.012
	07/27/15	0.066	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.039	<0.010	<0.050	<0.050	<0.20	<0.010	0.017	0.016
	11/18/15	0.049	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	0.027	<0.010	<0.050	<0.050	<0.20	<0.010	0.026	0.019
	07/22/16	0.11	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	0.051	<0.010	<0.050	<0.050	<0.20	<0.010	0.050	0.017
NRC-1-SW	07/23/13	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.025	0.015	<0.010	<0.20	<0.050	<0.05	<0.010	0.025	0.019
	12/22/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/27/15	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	11/18/15	0.022	<0.010	0.037	0.075	0.068	0.068	0.039	0.038	0.032	0.091	0.017	0.18	0.021	0.041	<0.050	<0.050	<0.20	0.017	0.13	0.14
	07/22/16	0.028	<0.010	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.050	<0.050	<0.20	<0.010	0.018	<0.010
SRC-1-SW	07/23/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12/22/14 ^D	<0.010	<0.010	<0.010	<0.010	0.013	0.013	0.010	<0.010	<0.010	0.011	<0.010	0.021	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	0.018
	12/22/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/27/15 ^D	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/27/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
COB-A-SW	07/23/13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.050	<0.05	<0.010	<0.010	<0.010
	12/22/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.01
	07/27/15	DRY - NO SAMPLE																			
	11/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																			
COB-B-SW	07/27/15	DRY - NO SAMPLE																			
	11/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																			

TABLE B-1
SURFACE WATER ANALYTICAL RESULTS - PAHs
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
COB-4-SW	12/22/14	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/27/15	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.010	0.012
	11/18/15	0.14	0.027	0.12	0.43	0.39	0.33	0.24	0.20	0.19	0.48	0.073	0.88	0.078	0.22	<0.050	<0.050	<0.20	0.10	0.48	0.74
	07/22/16	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16 ^D	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
COB-6-SW	07/23/13	0.073	0.025	0.015	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.034	0.034	<0.010	<0.20	<0.050	<0.05	<0.010	0.048	0.026
	12/22/14	0.089	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.020	0.026	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	0.013
	07/27/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11/18/15	0.016	<0.010	<0.010	0.015	0.015	0.016	0.019	<0.010	<0.010	0.018	<0.010	0.030	<0.010	0.016	<0.050	<0.050	<0.20	<0.010	0.014	0.030
	07/22/16	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
WB-1-SW	07/23/13	0.11	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.018	0.054	<0.010	<0.20	<0.050	<0.05	<0.010	0.066	<0.010
	12/22/14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	0.011	<0.010
	07/27/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11/18/15 ^D	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	11/18/15	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.20	<0.010	<0.010	<0.010
	07/22/16	0.019	<0.010	<0.010	<0.010	0.025	0.029	0.012	0.013	0.017	0.15	<0.010	0.16	0.011	0.011	<0.050	<0.050	<0.20	<0.010	0.070	0.092
NSE Tier 1 EQS Marine Water ¹		6	6	-	-	0.01	-	-	-	-	0.1	-	11	12	-	1	2	1.4	-	4.6	0.02
CCME MAL ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BP-1-SW	07/23/13	0.02	<0.03	<0.010	<0.010	<0.010	<0.010	<0.010	NM	<0.010	<0.010	<0.010	0.012	0.025	<0.010	<0.20	<0.050	<0.05	<0.03	0.034	0.01
	12/22/14	0.069	0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.041	0.083	<0.010	0.094	<0.050	<0.20	<0.010	0.065	<u>0.036</u>
	07/27/15	0.014	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.015	<0.010
	11/18/15	0.052	0.067	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	0.058	<0.010	0.057	<0.050	<0.20	<0.010	0.042	<u>0.022</u>
	07/22/16	0.014	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.050	<0.050	<0.20	<0.010	0.012	<0.010

**TABLE B-1
SURFACE WATER ANALYTICAL RESULTS - PAHs
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016**

Sample Location	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(j)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
Units		µg/L																			
NARROWS	12/22/14	0.10	0.11	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.033	0.089	<0.010	0.013	<0.050	0.22	<0.51	0.065	<u>0.030</u>
	07/27/15	0.035	0.037	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	0.033	<0.010	<0.050	<0.050	<0.20	<0.010	0.026	0.014
	11/18/15	0.074	0.099	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.023	0.071	<0.010	0.068	<0.050	<0.20	<0.010	0.041	0.019
	07/22/16	0.024	0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.021	<0.010	<0.050	<0.050	<0.20	<0.010	0.016	<0.010

NOTES:

- D - Field Duplicate
- NM - Not Measured or not analyzed
- mg/L - milligrams per liter
- UCL - Upper Concentration Limit
- No applicable guideline criteria
- 1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) 2013
- 2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) 2014

Bold	Concentration exceeds Tier I EQS for surface water (freshwater)
<u>Underline</u>	Concentration exceeds Tier I EQS for surface water (marine)
Shading	Concentration exceeds CCME FWAL
Shading	Concentration exceeds CCME MAL
<u>Double Underline</u>	Concentration exceeds Upstream Calculated 95% Upper Concentration Limit
Dashed Border	Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit
Red	Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit

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

TABLE B-2
 SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
 LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	PO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_pH (@20C)	Sat_pH (@4C)
Units		µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless	unitless
NSE Tier 1 EQS Fresh Water ¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL ²		-	-	-	-	-	-	120	-	-	-	13	0.6	-	1 ³	-	-	-	-	6.5-9.0	-	-	-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-SW	07/23/13	41100	1710	52000	5620	140	6.5	67	8.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	24	4.4	0.5	500	7.63	150	140	<1.0	270	4.81	0.93	0.08	-0.17	7.55	7.8
	12/22/14	20000	1400	27000	3700	62	26	30	7.3	0.046	110	0.18	<0.010	0.18	0.081	29	4.4	1.1	270	7.74	82	61	<1.0	150	2.65	1.53	-0.418	-0.669	8.16	8.41
	07/27/15	38000	1800	33000	4300	96	16	55	10.0	0.12	210	<0.050	<0.010	<0.050	0.087	9	2.0	1.1	380	7.95	99	95	<1.0	220	3.81	1.60	0.0480	-0.201	7.90	8.15
	11/18/15	27000	1700	28000	3800	72	24	43	7.6	0.048	110	0.12	<0.010	0.12	<0.050	20	5.3	2.1	320	7.81	84	72	<1.0	180	3.17	4.11	-0.271	-0.521	8.08	8.33
	07/22/16	27000	1400	27000	3500	75	10	40	8.6	0.096	140	0.11	0.012	0.12	0.052	65	9.8	1.6	270	7.88	82	75	<1.0	160	2.86	0.00	-0.188	-0.439	8.07	8.32
NRC-1-SW	07/23/13	27800	1560	16600	1370	46	19	27	9.6	0.022	<100	0.092	0.011	0.1	0.098	19	3.9	1.3	220	8.31	47	45	<1.0	131	2.09	2.56	-0.172	-0.423	8.48	8.73
	12/22/14	13000	640	12000	1500	17	20	20	5.1	<0.010	<100	0.21	<0.010	0.21	<0.050	10	2.2	0.51	140	7.28	36	17	<1.0	84	1.34	0.37	-1.75	-2.01	9.03	9.28
	07/27/15	20000	480	19000	2100	44	22	29	6.0	<0.010	<100	0.077	<0.010	0.077	0.077	42	5.8	2.4	220	7.47	56	44	<1.0	130	2.16	2.61	-0.963	-1.21	8.43	8.68
	11/18/15	14000	1000	12000	1800	25	15	25	5.7	<0.010	130	0.10	<0.010	0.10	<0.050	15	4.2	21	160	7.37	38	25	<1.0	95	1.51	0.980	-1.49	-1.74	8.86	9.11
	07/22/16	20000	690	18000	2200	49	15	25	5.8	0.012	<100	0.13	<0.010	0.13	<0.050	42	8.1	1.6	200	7.96	55	48	<1.0	120	2.00	0.250	-0.447	-0.698	8.41	8.66
SRC-1-SW	07/23/13	39700	2290	51700	7230	110	<u>40</u>	59	6.7	<0.010	<100	<0.05	<0.010	<0.05	<0.05	14	4.9	0.46	500	8.37	160	110	2.4	272	4.67	3.11	0.7	0.451	7.67	7.92
	12/22/14 ^D	34000	2700	46000	4800	87	<u>53</u>	56	8.3	<0.010	<100	0.24	0.025	0.26	0.20	16	4.6	5.0	450	7.92	130	86	<1.0	260	4.44	2.42	0.108	-0.141	7.81	8.06
	12/22/14	34000	2600	46000	4800	86	<u>54</u>	56	7.6	<0.010	<100	0.23	0.023	0.25	0.21	16	4.8	5.4	440	7.80	140	85	<1.0	260	4.43	1.84	-0.01	-0.259	7.81	8.06
	07/27/15 ^D	40000	1900	42000	4700	95	<u>46</u>	55	6.6	<0.010	<100	0.092	<0.010	0.092	0.084	17	5.0	1.5	430	7.79	120	94	<1.0	250	4.41	1.73	-0.024	-0.273	7.81	8.06
	07/27/15	38000	1800	41000	4300	95	<u>47</u>	57	6.7	<0.010	<100	0.092	<0.010	0.092	0.079	16	5.0	1.6	430	7.66	120	95	<1.0	250	4.49	4.54	-0.157	-0.407	7.82	8.07
	11/18/15	32000	2700	41000	4600	94	<u>43</u>	51	5.7	<0.010	<100	0.076	<0.010	0.076	<0.050	13	5.0	4.4	430	7.87	120	93	<1.0	240	4.22	3.94	0.0500	-0.200	7.82	8.07
	07/22/16	33000	2900	48000	5600	100	<u>51</u>	46	8.9	0.013	<100	0.08	<0.010	0.08	<0.050	22	7.3	1.8	420	7.99	140	100	<1.0	260	4.39	0.00	0.266	0.016	7.73	7.98
COB-A-SW	07/23/13	94700	27000	336000	34900	150	<u>740</u>	<u>150</u>	22	<0.010	<100	3.5	<0.010	3.5	<0.05	5.3	4.8	0.1	2000	7.90	980	150	1.1	1510	22.8	3.51	1.0	0.756	6.9	7.14
	12/22/14	23000	3300	88000	13000	97	<u>160</u>	37	13	<0.010	<100	0.4	<0.010	0.4	<0.050	5.4	2	0.41	640	7.68	270	96	<1.0	400	6.32	1.94	0.165	-0.084	7.52	7.76
	07/27/15	DRY - NO SAMPLE																												
	11/18/15	24000	3700	88000	13000	120	<u>170</u>	33	12	0.013	<100	0.25	<0.010	0.25	<0.050	<5.0	2.6	0.25	640	7.95	270	120	<1.0	420	6.88	2.38	0.505	0.257	7.44	7.69
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																												
COB-B-SW	07/27/15	DRY - NO SAMPLE																												
	11/18/15	25000	3800	89000	13000	110	<u>190</u>	35	11	0.013	<100	0.35	<0.010	0.35	<0.050	<5.0	2.4	<0.10	670	7.86	280	110	<1.0	430	7.13	3.03	0.393	0.144	7.46	7.71
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																												

TABLE B-2
 SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
 LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Sample Date	Al	As	Ba	Be	Bi	B	Cd	Cl	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Ss	Ag	Sr	F	Se	Br	I	V	Zn	
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
NSE Tier 1 EQS Fresh Water ¹		5	20	5.0	1000	5.3	-	1200	0.01	-	10	2	300	1	820	0.026	73	25	1.0	0.1	21000	0.8	-	-	300	6	30
CCME FWAL ²		100 ⁵	-	5	-	-	-	1500	0.09	1 ⁴	-	300	-	-	0.026	73	-	1	0.25	-	0.8	-	-	15	-	30	
Upstream Calculated 95% UCL		220	-	1.6	-	-	-	-	0.1	8.3	-	3318	1.2	583	-	-	-	1.9	-	132	-	-	-	-	-	-	
Pre-Construction/Baseline Calculated 95% UCL		-	-	1.98	-	-	-	-	-	-	1.3	-	1900	-	800	-	-	-	-	210	-	-	-	-	-	-	
CB-SW	07/23/13	28.5	<1.0	1.4	61.9	<1.0	<2.0	<50	0.016	1.3	<0.40	2.0	454	<0.50	3690	NM	<2.0	<2.0	<1.0	<0.10	196	<0.10	<2.0	<2.0	0.37	<2.0	<5.0
	12/22/14	110	<1.0	<1.0	27	<1.0	<2.0	<50	0.018	<1.0	<0.40	<2.0	290	<0.50	190	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.5	0.17	<2.0	6.0
	07/27/15	28	<1.0	<1.0	52	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	260	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	320	<0.10	<2.0	<2.0	<0.10	<2.0	9.0
	11/18/15	130	<1.0	<1.0	29	<1.0	<2.0	<50	0.011	<1.0	<0.40	<2.0	280	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	4.3	0.12	<2.0	6.1
	07/22/16	55	<1.0	1.4	30	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	640	<0.50	71	<0.013	<2.0	<2.0	<1.0	<0.10	160	<0.10	<2.0	5.6	<0.10	<2.0	<5.0
NRC-1-SW	07/23/13	131	<1.0	1.4	11.8	<1.0	<2.0	<50	0.021	<1.0	<0.40	3.1	148	1.53	69.1	NM	<2.0	<2.0	<1.0	<0.10	64.7	<0.10	<2.0	2.4	0.21	2.2	5.3
	12/22/14	58	<1.0	<1.0	12	<1.0	<2.0	<50	0.022	<1.0	<0.40	<2.0	290	<0.50	85	<0.013	<2.0	<2.0	<1.0	<0.10	32	<0.10	<2.0	<2.0	<0.10	<2.0	9.1
	07/27/15	45	<1.0	<1.0	11	<1.0	<2.0	<50	0.019	<1.0	<0.40	<2.0	1300	<0.50	75	<0.013	<2.0	<2.0	<1.0	<0.10	54	<0.10	<2.0	<2.0	<0.10	<2.0	11
	11/18/15	1500	<1.0	3.5	29	<1.0	<2.0	<50	0.14	1.9	1.5	5.0	3800	9.5	1100	<0.013	<2.0	3.3	<1.0	<0.10	36	<0.10	<2.0	34	0.14	3.0	27
	07/22/16	31	<1.0	<1.0	10	<1.0	<2.0	<50	0.016	<1.0	<0.40	<2.0	970	0.61	47	<0.013	<2.0	<2.0	<1.0	<0.10	52	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
SRC-1-SW	07/23/13	29	<1.0	1.2	10.2	<1.0	<2.0	57	<0.01	<1.0	<0.40	<2.0	69	<0.50	41.4	NM	<2.0	<2.0	<1.0	<0.10	174	<0.10	<2.0	<2.0	0.38	<2.0	<5
	12/22/14 ^D	350	<1.0	<1.0	17	<1.0	<2.0	110	0.042	<1.0	<0.40	2.8	350	1.2	200	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.8	0.40	<2.0	7.0
	12/22/14	290	<1.0	<1.0	17	<1.0	<2.0	110	0.035	<1.0	<0.40	2.6	340	1.2	190	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	6.6	0.40	<2.0	6.9
	07/27/15 ^D	51	<1.0	1.0	17	<1.0	<2.0	64	0.015	1.5	<0.40	<2.0	190	<0.50	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	<2.0	0.32	<2.0	8.4
	07/27/15	51	<1.0	1.0	16	<1.0	<2.0	63	0.013	<1.0	<0.40	2.4	210	1.1	260	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	2.4	0.29	<2.0	9.5
	11/18/15	240	<1.0	<1.0	16	<1.0	<2.0	57	0.023	1.2	<0.40	2.2	310	0.75	230	<0.013	<2.0	<2.0	<1.0	<0.10	150	<0.10	<2.0	5.3	0.33	<2.0	<5.0
	07/22/16	50	<1.0	1.9	11	<1.0	<2.0	91	0.018	<1.0	<0.40	<2.0	350	<0.50	350	<0.013	<2.0	<2.0	<1.0	<0.10	170	<0.10	<2.0	2.1	0.38	<2.0	<5.0
COB-A-SW	07/23/13	17.2	<1.0	<1	56.2	<1.0	<2.0	415	0.015	<1.0	<0.40	<2.0	56	<0.50	27.9	NM	<2.0	<2.0	<1.0	<0.10	671	<0.10	<2.0	<2.0	2.14	<2.0	<5
	12/22/14	16	<1.0	<1.0	14	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	51	<0.50	25	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.38	<2.0	<5.0
	07/27/15	DRY - NO SAMPLE																									
	11/18/15	5.1	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	82	<0.50	74	<0.013	<2.0	<2.0	<1.0	<0.10	260	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																									
COB-B-SW	07/27/15	DRY - NO SAMPLE																									
	11/18/15	7.9	<1.0	<1.0	18	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	<50	<0.50	21	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	<2.0	0.42	<2.0	<5.0
	07/22/16	STAGNANT/STANDING WATER - NO FLOW - NO SAMPLE																									

**TABLE B-2
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016**

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	PO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURBIDITY	CONDUCTIVITY	pH	HARDNESS	BICARB ALKALINITY	CARB ALKALINITY	TDS	Anion Sum	Ion Balance	Langelier Index (@20C)	Langelier Index (@4C)	Sat_pH (@20C)	Sat_pH (@4C)
		Units	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	TCU	mg/L	NTU	µS/cm	pH	mg/L	mg/L	mg/L	mg/L	me/L	%	unitless	unitless	unitless
COB-4-SW	12/22/14	20000	1600	34000	3600	53	47	31	7.4	<0.010	<100	0.26	<0.010	0.26	0.057	12	3	1.5	300	7.70	99	52	<1.0	180	2.92	0.17	-0.431	-0.681	8.13	8.38
	07/27/15	37000	2900	60000	6300	94	100	58	8.5	<0.010	<100	0.31	0.013	0.33	<0.050	11	4.1	1.8	530	7.72	180	93	<1.0	330	5.65	4.15	0.036	-0.213	7.68	7.93
	11/18/15	21000	2800	33000	4600	58	41	33	7.5	0.012	390	0.18	<0.010	0.18	<0.050	14	9.3	140	310	7.56	100	58	<1.0	190	2.96	8.50	-0.540	-0.790	8.10	8.35
	07/22/16	34000	2400	55000	5300	98	74	54	9.2	0.015	<100	0.15	<0.010	0.15	<0.050	19	5.2	1.3	460	7.91	160	98	<1.0	300	5.06	3.27	0.223	-0.026	7.69	7.94
	07/22/16 ^D	36000	2500	55000	5700	99	72	49	9.1	0.016	<100	0.15	<0.010	0.15	<0.050	18	4.8	1.2	460	7.85	160	99	<1.0	290	4.89	0.31	0.169	-0.081	7.68	7.93
COB-6-SW	07/23/13	69200	5110	98900	9820	81	170	110	11	<0.010	<100	0.35	<0.010	0.35	<0.05	7.2	2.4	0.38	890	8.36	290	79	1.7	520	8.18	4.1	0.78	0.532	7.58	7.83
	12/22/14	22000	1800	39000	3800	58	56	35	8.3	<0.010	<100	0.28	0.011	0.29	0.1	11	2.6	0.87	340	7.86	110	57	<1.0	200	3.33	0.76	-0.173	-0.423	8.04	8.29
	07/27/15	39000	2600	57000	5000	93	91	61	8.4	<0.010	<100	0.18	0.015	0.19	<0.050	10	3.7	0.98	520	8.46	160	91	2.5	320	5.5	4.46	0.75	0.501	7.71	7.96
	11/18/15	27000	2100	37000	3700	70	44	42	7.6	0.012	<100	0.16	<0.010	0.16	<0.050	10	3.7	4.9	360	7.96	110	69	<1.0	210	3.51	1.89	-0.023	-0.273	7.98	8.23
07/22/16	40000	2400	55000	4700	99	64	67	8.2	0.015	<100	0.081	<0.010	0.081	<0.050	23	5.3	1.0	490	8.05	160	98	1.0	300	5.21	2.46	0.365	0.116	7.69	7.94	
WB-1-SW	07/23/13	5750000	210000	323000	667000	83	1500	11000	2	<0.010	<1000	0.051	<0.010	0.051	0.2	9.6	<5	6	31000	7.65	3600	82	<1.0	19000	330	0.43	0.178	-0.059	7.47	7.71
	12/22/14	12000	700	7500	1400	17	7.9	21	3.4	0.011	<100	0.14	<0.010	0.14	0.12	32	3.7	0.83	120	7.19	25	17	<1.0	65	1.1	2.33	-2.04	-2.29	9.23	9.48
	07/27/15	19000	860	12000	2200	28	10	32	3.6	0.023	<100	0.16	0.016	0.18	0.18	51	6.3	0.82	170	7.44	39	28	<1.0	98	1.68	0.00	-1.37	-1.62	8.82	9.07
	11/18/15 ^D	14000	760	9200	1600	23	8.3	26	3.9	0.012	<100	0.098	<0.010	0.098	<0.050	30	4.5	0.18	140	7.42	29	23	<1.0	77	1.36	6.25	-1.59	-1.84	9.01	9.26
	11/18/15	14000	760	9600	1600	23	8.3	24	3.9	0.012	<100	0.11	<0.010	0.11	<0.050	30	4.3	0.67	140	7.45	31	23	<1.0	77	1.32	3.13	-1.54	-1.79	8.99	9.24
07/22/16	1600000	54000	79000	190000	62	410	2900	4.2	0.024	<100	0.22	0.021	0.24	0.084	37	16	2.2	8500	7.52	980	62	<1.0	5300	92.8	2.21	-0.583	-0.823	8.11	8.35	
NSE Tier 1 EQS Marine Water ¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME MAL ²		-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	-	-	-	7.0-8.7	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	2180	-	-	-	-	-	-	-	-	-	-	88	-	-	-	-	-	-	-	-	-	-	-	-
BP-1-SW	07/23/13	8480000	304000	343000	1000000	84	2000	14000	<0.5	<0.010	<1000	<0.05	<0.010	<0.05	<0.05	<5	<5	7.2	41000	8.07	5000	83	<1.0	26000	434	4.66	0.664	0.425	7.41	7.65
	12/22/14	1000000	38000	68000	120000	56	270	1900	5.5	0.012	<100	0.19	0.019	0.21	0.11	18	2.3	1.1	6300	8.42	680	54	1.3	3500	60.8	1.58	0.248	0.007	8.17	8.41
	07/27/15	7100000	260000	300000	870000	88	1500	13000	1.1	0.018	<1000	0.11	0.011	0.12	0.05	6.8	<5.0	0.6	37000	7.83	4300	87	<1.0	23000	393	0.97	0.369	0.131	7.46	7.7
	11/18/15	650000	27000	52000	71000	58	190	1200	5.4	0.015	<100	0.14	<0.010	0.14	0.064	25	3.3	1.0	4200	8.00	420	57	<1.0	2200	38.8	1.80	-0.189	-0.432	8.19	8.44
	07/22/16	7500000	280000	300000	910000	92	1600	13000	1.0	0.026	<1000	0.092	0.01	0.10	0.088	8.3	<5.0	1.2	36000	7.99	4500	91	<1.0	24000	411	1.77	0.559	0.321	7.43	7.67
NARROWS	12/22/14	600000	24000	58000	74000	57	170	1100	5.6	0.013	<100	0.22	0.016	0.24	0.11	16	2.0	1.0	3900	8.56	450	55	1.9	2100	36	0.1	0.403	0.16	8.15	8.4
	07/27/15	7200000	270000	300000	900000	91	1300	13000	1.2	<0.010	<1000	0.067	<0.010	0.067	0.067	7.4	<5.0	0.36	37000	7.96	4400	90	<1.0	23000	383	3.36	0.502	0.265	7.45	7.69
	11/18/15	330000	15000	38000	36000	55	110	640	5.8	0.016	<100	0.15	<0.010	0.15	0.053	21	3.7	1.7	2400	7.86	240	55	<1.0	1200	21.6	4.13	-0.398	-0.643	8.26	8.50
	07/22/16	7500000	270000	300000	900000	93	1400	12000	1.3	0.017	<1000	0.05	0.01	0.06	0.08	9.9	2.3	1.2	36000	7.97	4400	92	<1.0	23000	378	5.2	0.533	0.295	7.44	7.68

TABLE B-2
 SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
 LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Sample Date	Units																									
		Al	Sb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Sr	Ag	Sr	Fl	Sn	Fl	U	V	Zn
COB-4-SW	12/22/14	82	<1.0	<1.0	20	<1.0	<2.0	<50	0.014	<1.0	<0.40	<2.0	210	<0.50	95	<0.013	<2.0	<2.0	<1.0	<0.10	140	<0.10	<2.0	3.2	0.18	<2.0	7.2
	07/27/15	51	<1.0	<1.0	32	<1.0	<2.0	60	<0.010	<1.0	<0.40	<2.0	460	<0.50	110	<0.013	<2.0	<2.0	<1.0	<0.10	250	<0.10	<2.0	2.1	0.35	<2.0	10
	11/18/15	7100	<1.0	13	77	<1.0	<2.0	<50	0.29	8.0	4.6	17	14000	37	1500	0.082	<2.0	9.5	<1.0	<0.10	150	0.18	<2.0	200	0.53	14	96
	07/22/16	28	<1.0	<1.0	24	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	300	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	270	<0.10	<2.0	<2.0	0.32	<2.0	<5.0
	07/22/16 ^D	42	<1.0	<1.0	26	<1.0	<2.0	<50	<0.010	<1.0	<0.40	2.0	310	<0.50	140	<0.013	<2.0	<2.0	<1.0	<0.10	280	<0.10	<2.0	<2.0	0.33	<2.0	<5.0
COB-6-SW	07/23/13	65.7	<1.0	1.0	66.6	<1.0	<2.0	66	<0.01	<1.0	<0.40	<2.0	61	<0.50	30.3	NM	<2.0	<2.0	<1.0	<0.10	645	<0.10	<2.0	<2.0	0.68	<2.0	<5
	12/22/14	61	<1.0	<1.0	22	<1.0	<2.0	<50	0.01	<1.0	<0.40	<2.0	170	<0.50	56	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	<2.0	0.22	<2.0	6.0
	07/27/15	39	<1.0	<1.0	29	<1.0	<2.0	52	<0.010	<1.0	<0.40	2.2	160	<0.50	23	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.34	<2.0	7.4
	11/18/15	220	<1.0	<1.0	21	<1.0	<2.0	<50	0.018	<1.0	<0.40	<2.0	490	1.5	79	<0.013	<2.0	<2.0	<1.0	<0.10	180	<0.10	<2.0	4.0	0.22	<2.0	<5.0
	07/22/16	46	<1.0	1.0	26	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	180	<0.50	37	<0.013	<2.0	<2.0	<1.0	<0.10	300	<0.10	<2.0	<2.0	0.3	<2.0	<5.0
WB-1-SW	07/23/13	<50	<10	<10	280	<10	<20	2470	0.6	<10	<4.0	<20	936	<5.0	1920	NM	<20	<20	<10	<1.0	4660	<1.0	<20	<20	1.6	<20	<50
	12/22/14	180	<1.0	<1.0	15	<1.0	<2.0	<50	0.038	<1.0	<0.40	<2.0	270	0.71	95	<0.013	<2.0	<2.0	<1.0	<0.10	53	<0.10	<2.0	4.6	<0.10	<2.0	10
	07/27/15	89	<1.0	<1.0	18	<1.0	<2.0	<50	0.012	<1.0	<0.40	<2.0	480	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	100	<0.10	<2.0	<2.0	<0.10	<2.0	7.9
	11/18/15 ^D	63	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	41	<0.013	<2.0	<2.0	<1.0	<0.10	70	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
	11/18/15	63	<1.0	<1.0	15	<1.0	<2.0	<50	<0.010	<1.0	<0.40	<2.0	200	<0.50	43	<0.013	<2.0	<2.0	<1.0	<0.10	73	<0.10	<2.0	<2.0	<0.10	<2.0	<5.0
07/22/16	87	<1.0	<1.0	39	<1.0	<2.0	690	0.035	<1.0	<0.40	<2.0	590	0.56	160	<0.013	<2.0	<2.0	<1.0	<0.10	1300	<0.10	<2.0	<2.0	0.47	<2.0	11	
NSE Tier 1 EQS Marine Water ¹		-	500	12.5	500	100	-	1200	0.12	-	-	2	-	2	-	0.016	-	8.3	2	1.5	-	21.3	-	-	100	50	10
CCME MAL ²		-	-	12.5	-	-	-	-	0.12	1.5 ³	-	-	-	-	-	0.016	-	-	-	-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	-	-	-	-	0.9	-	190	-	70	0.189	-	-	-	-	7000	-	-	-	-	-	-
BP-1-SW	07/23/13	168	<10	<10	41	<10	<20	3700	0.14	<10	<4.0	<20	1990	<5	109	<0.013	<20	<20	<10	<1.0	6130	<1.0	<20	<20	2.6	<20	<50
	12/22/14	110	<1.0	<1.0	19	<1.0	<2.0	480	0.028	<1.0	<0.40	<2.0	240	<0.50	61	<0.013	<2.0	<2.0	<1.0	<0.10	950	<0.10	<2.0	<2.0	0.41	<2.0	7.2
	07/27/15	86	<10	<10	19	<10	<20	2900	<0.10	<10	<4.0	<20	<500	<5.0	59	<0.013	<20	<20	<10	<1.0	5300	<1.0	<20	<20	2.1	<20	<50
	11/18/15	140	<1.0	<1.0	16	<1.0	<2.0	330	0.014	<1.0	<0.40	<2.0	410	<0.50	57	0.07	<2.0	<2.0	<1.0	<0.10	580	<0.10	<2.0	<2.0	0.29	<2.0	41
	07/22/16	63	<10	<10	23	<10	<20	3600	<0.10	<10	<4.0	<20	<500	<5.0	71	<0.013	<20	<20	<10	<1.0	5500	<1.0	<20	<20	2.4	<20	<50
NARROWS	12/22/14	110	<1.0	<1.0	19	<1.0	<2.0	300	0.027	<1.0	<0.40	<2.0	250	<0.50	63	<0.013	<2.0	<2.0	<1.0	<0.10	610	<0.10	<2.0	2.4	0.32	<2.0	7.3
	07/27/15	140	<10	<10	21	<10	<20	3100	<0.10	<10	<4.0	<20	<500	<5.0	100	<0.013	<20	<20	<10	<1.0	5400	<1.0	<20	<20	2.2	<20	<50
	11/18/15	76	1.8	<1.0	15	<1.0	<2.0	180	0.012	<1.0	<0.40	<2.0	320	<0.50	45	<0.013	<2.0	<2.0	<1.0	<0.10	370	<0.10	<2.0	<2.0	0.22	<2.0	63
	07/22/16	51	<10	<10	28	<10	<20	3500	<0.10	<10	<4.0	<20	<500	<5.0	120	<0.013	<20	<20	<10	<1.0	5400	<1.0	<20	<20	2.1	<20	<50

NOTES:

D - Field Duplicate

NM - Not Measured or not analyzed

mg/L - milligrams per liter

UCL - Upper Concentration Limit

- No applicable guideline criteria

1 - Nova Scotia Environment Tier I Environmental Quality Standards (EQS) for surface water (freshwater and marine) 2013

2 - Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (freshwater and marine) 2014

3 - Guideline value for NH3 is based on a pH value of 5 and a temperature of 10 C

4 - Guideline for chromium is based on CR6+

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

Bold	Concentration exceeds Tier I EQS for surface water (freshwater)
<u>Underline</u>	Concentration exceeds Tier I EQS for surface water (marine)
Shading	Concentration exceeds CCME FWAL
Shading	Concentration exceeds CCME MAL
<u>Double Underline</u>	Concentration exceeds Upstream Calculated 95% UCL
<u>Dashed Border</u>	Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit
Red	Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit
<i>italics</i>	Laboratory detection limit is higher than guideline criteria

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

TABLE B-3

HE TREATMENT PLANT DISCHARGE DATA AND SURFACE WATER DATA COMPARISON SUMMARY TABLE
 LTMM SURFACE WATER QUALITY MONITORING PROGRAM - JULY 2016

Sample Location	Effluent			CB-SW	NRC-1-SW	SRC-1-SW	COB-A-SW	COB-B-SW	COB-4-SW	COB-6-SW	WB-1-SW	BP-1-SW	NARROWS
	Sample Date	Range 2014-2016	07/21/16										
Al (ug/L)	12	150	44	55	31	50	Dry	Dry	42	46	87	63	51
Zn (ug/L)	<5.0	9.8	5.3	<5.0	<5.0	<5.0	Dry	Dry	<5.0	<5.0	11	<50	<50
pH	7.6	8.1	7.9	7.88	7.96	7.99	Dry	Dry	7.85	8.05	7.52	7.99	7.97
Hard (mg/L CaCO ₃)	190	620	190	82	55	140	Dry	Dry	160	160	980	4500	4400

APPENDIX C
LABORATORY CERTIFICATES

Your P.O. #: 4104251070
 Site#: LTMM SURFACE WATER MONITORING
 Site Location: LTMM SURFACE WATER MONITORING
 Your C.O.C. #: 570825

Attention:Nadine Wambolt

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

Report Date: 2016/08/04
 Report #: R4092421
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6F5932

Received: 2016/07/22, 17:00

Sample Matrix: Water
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide (1)	9	N/A	2016/07/29	N/A	SM 22 4500-CO2 D
Alkalinity (1)	8	N/A	2016/08/02	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity (1)	1	N/A	2016/08/03	ATL SOP 00013	EPA 310.2 R1974 m
Chloride (1)	9	N/A	2016/08/03	ATL SOP 00014	SM 22 4500-Cl- E m
Colour (1)	9	N/A	2016/08/04	ATL SOP 00020	SM 22 2120C m
Conductance - water (1)	9	N/A	2016/07/29	ATL SOP 00004	SM 22 2510B m
Hardness (calculated as CaCO3) (1)	1	N/A	2016/07/29	ATL SOP 00048	SM 22 2340 B
Hardness (calculated as CaCO3) (1)	8	N/A	2016/08/02	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL) (1)	9	2016/07/28	2016/07/28	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS (1)	1	2016/07/28	2016/07/28	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS (1)	1	2016/07/29	2016/07/29	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS (1)	3	2016/07/29	2016/07/30	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS (1)	4	2016/07/29	2016/08/02	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference) (1)	9	N/A	2016/08/04		Auto Calc.
Anion and Cation Sum (1)	9	N/A	2016/08/03		Auto Calc.
Nitrogen Ammonia - water (1)	9	N/A	2016/08/02	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite (1)	9	N/A	2016/08/03	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite (1)	9	N/A	2016/08/03	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N) (1)	9	N/A	2016/08/04	ATL SOP 00018	ASTM D3867
PAH in Water by GC/MS (SIM) (1)	1	2016/07/28	2016/08/03	ATL SOP 00103	EPA 8270D 2007 m
PAH in Water by GC/MS (SIM) (1)	9	2016/07/28	2016/08/04	ATL SOP 00103	EPA 8270D 2007 m
pH (1, 2)	9	N/A	2016/07/29	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho (1)	9	N/A	2016/08/02	ATL SOP 00021	EPA 365.2 m
Sat. pH and Langelier Index (@ 20C) (1)	9	N/A	2016/08/04	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	9	N/A	2016/08/04	ATL SOP 00049	Auto Calc.
Reactive Silica (1)	9	N/A	2016/08/02	ATL SOP 00022	EPA 366.0 m
Sulphate (1)	9	N/A	2016/08/04	ATL SOP 00023	ASTMD516-11 m
Total Dissolved Solids (TDS calc) (1)	9	N/A	2016/08/04		Auto Calc.
Organic carbon - Total (TOC) (1, 3)	9	N/A	2016/07/29	ATL SOP 00037	SM 22 5310C m
Turbidity (1)	9	N/A	2016/07/29	ATL SOP 00011	EPA 180.1 R2 m

Your P.O. #: 4104251070
Site#: LTMM SURFACE WATER MONITORING
Site Location: LTMM SURFACE WATER MONITORING
Your C.O.C. #: 570825

Attention:Nadine Wambolt

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

Report Date: 2016/08/04
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6F5932

Received: 2016/07/22, 17:00

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 Bedford
- (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.
Candace Hillier, CI Svc - Sydney
Email: chillier@maxxam.ca
Phone# (902) 567 1255

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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		CTS203	CTS226			CTS227		CTS231		
Sampling Date		2016/07/22	2016/07/22			2016/07/22		2016/07/22		
COC Number		570825	570825			570825		570825		
	UNITS	COB-4-SW	COB-6-SW	RDL	QC Batch	CB-SW	RDL	SRC-1-SW	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	5.06	5.21	N/A	4594441	2.86	N/A	4.39	N/A	4594441
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	98	98	1.0	4594438	75	1.0	100	1.0	4594438
Calculated TDS	mg/L	300	300	1.0	4594445	160	1.0	260	1.0	4594445
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	1.0	4594438	<1.0	1.0	<1.0	1.0	4594438
Cation Sum	me/L	4.74	4.96	N/A	4594441	2.86	N/A	4.39	N/A	4594441
Hardness (CaCO3)	mg/L	160	160	1.0	4594439	82	1.0	140	1.0	4594439
Ion Balance (% Difference)	%	3.27	2.46	N/A	4594440	0.00	N/A	0.00	N/A	4594440
Langelier Index (@ 20C)	N/A	0.223	0.365		4594443	-0.188		0.266		4594443
Langelier Index (@ 4C)	N/A	-0.0260	0.116		4594444	-0.439		0.0160		4594444
Nitrate (N)	mg/L	0.15	0.081	0.050	4594442	0.11	0.050	0.080	0.050	4594442
Saturation pH (@ 20C)	N/A	7.69	7.69		4594443	8.07		7.73		4594443
Saturation pH (@ 4C)	N/A	7.94	7.94		4594444	8.32		7.98		4594444
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	98	99	5.0	4599189	75	5.0	100	10	4599189
Dissolved Chloride (Cl)	mg/L	54	67	1.0	4599191	40	1.0	46	1.0	4599191
Colour	TCU	19	23	5.0	4599194	65	25	22	5.0	4599194
Nitrate + Nitrite (N)	mg/L	0.15	0.081	0.050	4599196	0.12	0.050	0.080	0.050	4599196
Nitrite (N)	mg/L	<0.010	<0.010	0.010	4599197	0.012	0.010	<0.010	0.010	4599197
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	<0.050	0.050	4598192	0.052	0.050	<0.050	0.050	4598192
Total Organic Carbon (C)	mg/L	5.2	5.3	0.50	4599588	9.8	0.50	7.3	0.50	4599588
Orthophosphate (P)	mg/L	0.015	0.015	0.010	4599195	0.096	0.010	0.013	0.010	4599195
pH	pH	7.91	8.05	N/A	4599156	7.88	N/A	7.99	N/A	4599154
Reactive Silica (SiO2)	mg/L	9.2	8.2	0.50	4599193	8.6	0.50	8.9	0.50	4599193
Dissolved Sulphate (SO4)	mg/L	74	64	10	4599192	10	2.0	51	10	4599192
Turbidity	NTU	1.3	1.0	0.10	4599434	1.6	0.10	1.8	0.10	4599459
Conductivity	uS/cm	460	490	1.0	4599157	270	1.0	420	1.0	4599155
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID		CTS232		CTS233			CTS234		
Sampling Date		2016/07/22		2016/07/22			2016/07/22		
COC Number		570825		570825			570825		
	UNITS	NRC-1-SW	RDL	NARROWS	RDL	QC Batch	WB-1-SW	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	2.00	N/A	378	N/A	4594441	92.8	N/A	4594441
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	48	1.0	92	1.0	4594438	62	1.0	4594438
Calculated TDS	mg/L	120	1.0	23000	1.0	4594445	5300	1.0	4594445
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0	4594438	<1.0	1.0	4594438
Cation Sum	me/L	2.01	N/A	420	N/A	4594441	88.8	N/A	4594441
Hardness (CaCO3)	mg/L	55	1.0	4400	1.0	4594439	980	1.0	4594439
Ion Balance (% Difference)	%	0.250	N/A	5.20	N/A	4594440	2.21	N/A	4594440
Langelier Index (@ 20C)	N/A	-0.447		0.533		4594443	-0.583		4594443
Langelier Index (@ 4C)	N/A	-0.698		0.295		4594444	-0.823		4594444
Nitrate (N)	mg/L	0.13	0.050	0.050	0.050	4594442	0.22	0.050	4594442
Saturation pH (@ 20C)	N/A	8.41		7.44		4594443	8.11		4594443
Saturation pH (@ 4C)	N/A	8.66		7.68		4594444	8.35		4594444
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	49	5.0	93	5.0	4599189	62	5.0	4599189
Dissolved Chloride (Cl)	mg/L	25	1.0	12000	100	4599191	2900	20	4599191
Colour	TCU	42	5.0	9.9	5.0	4599194	37	5.0	4599194
Nitrate + Nitrite (N)	mg/L	0.13	0.050	0.060	0.050	4599196	0.24	0.050	4599196
Nitrite (N)	mg/L	<0.010	0.010	0.010	0.010	4599197	0.021	0.010	4599197
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	0.080	0.050	4598192	0.084	0.050	4598192
Total Organic Carbon (C)	mg/L	8.1	0.50	2.3	0.50	4599588	16 (1)	5.0	4599588
Orthophosphate (P)	mg/L	0.012	0.010	0.017	0.010	4599195	0.024	0.010	4599195
pH	pH	7.96	N/A	7.97	N/A	4599156	7.52	N/A	4599156
Reactive Silica (SiO2)	mg/L	5.8	0.50	1.3	0.50	4599193	4.2	0.50	4599193
Dissolved Sulphate (SO4)	mg/L	15	2.0	1400	200	4599192	410	40	4599192
Turbidity	NTU	1.6	0.10	1.2	0.10	4599434	2.2	0.10	4599430
Conductivity	uS/cm	200	1.0	36000	1.0	4599157	8500	1.0	4599157
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

Maxxam ID		CTS236			CTS237		
Sampling Date		2016/07/22			2016/07/22		
COC Number		570825			570825		
	UNITS	BP-1-SW	RDL	QC Batch	FD-011	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	411	N/A	4594441	4.89	N/A	4594441
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	91	1.0	4594438	99	1.0	4594438
Calculated TDS	mg/L	24000	1.0	4594445	290	1.0	4594445
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	4594438	<1.0	1.0	4594438
Cation Sum	me/L	426	N/A	4594441	4.86	N/A	4594441
Hardness (CaCO3)	mg/L	4500	1.0	4594439	160	1.0	4594439
Ion Balance (% Difference)	%	1.77	N/A	4594440	0.310	N/A	4594440
Langelier Index (@ 20C)	N/A	0.559		4594443	0.169		4594443
Langelier Index (@ 4C)	N/A	0.321		4594444	-0.0810		4594444
Nitrate (N)	mg/L	0.092	0.050	4594442	0.15	0.050	4594442
Saturation pH (@ 20C)	N/A	7.43		4594443	7.68		4594443
Saturation pH (@ 4C)	N/A	7.67		4594444	7.93		4594444
Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	92	5.0	4599189	99	5.0	4599189
Dissolved Chloride (Cl)	mg/L	13000	100	4599191	49	1.0	4599191
Colour	TCU	8.3	5.0	4599194	18	5.0	4599194
Nitrate + Nitrite (N)	mg/L	0.10	0.050	4599196	0.15	0.050	4599196
Nitrite (N)	mg/L	0.010	0.010	4599197	<0.010	0.010	4599197
Nitrogen (Ammonia Nitrogen)	mg/L	0.088	0.050	4598192	<0.050	0.050	4598192
Total Organic Carbon (C)	mg/L	<5.0 (1)	5.0	4599588	4.8	0.50	4599588
Orthophosphate (P)	mg/L	0.026	0.010	4599195	0.016	0.010	4599195
pH	pH	7.99	N/A	4599154	7.85	N/A	4599154
Reactive Silica (SiO2)	mg/L	1.0	0.50	4599193	9.1	0.50	4599193
Dissolved Sulphate (SO4)	mg/L	1600	200	4599192	72	10	4599192
Turbidity	NTU	1.2	0.10	4599459	1.2	0.10	4599434
Conductivity	uS/cm	36000	1.0	4599155	460	1.0	4599155
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable (1) Elevated reporting limit due to sample matrix.							

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		CTS203	CTS226	CTS227	CTS231	CTS232	CTS233	CTS234		
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22		
COC Number		570825	570825	570825	570825	570825	570825	570825		
	UNITS	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	NRC-1-SW	NARROWS	WB-1-SW	RDL	QC Batch

Metals										
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	4597404
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										

Maxxam ID		CTS236	CTS237		
Sampling Date		2016/07/22	2016/07/22		
COC Number		570825	570825		
	UNITS	BP-1-SW	FD-011	RDL	QC Batch
Metals					
Total Mercury (Hg)	ug/L	<0.013	<0.013	0.013	4597404
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		CTS203		CTS226	CTS227	CTS231		CTS232		
Sampling Date		2016/07/22		2016/07/22	2016/07/22	2016/07/22		2016/07/22		
COC Number		570825		570825	570825	570825		570825		
	UNITS	COB-4-SW	QC Batch	COB-6-SW	CB-SW	SRC-1-SW	QC Batch	NRC-1-SW	RDL	QC Batch
Metals										
Total Aluminum (Al)	ug/L	28	4599169	46	55	50	4599379	31	5.0	4597694
Total Antimony (Sb)	ug/L	<1.0	4599169	<1.0	<1.0	<1.0	4599379	<1.0	1.0	4597694
Total Arsenic (As)	ug/L	<1.0	4599169	1.0	1.4	1.9	4599379	<1.0	1.0	4597694
Total Barium (Ba)	ug/L	24	4599169	26	30	11	4599379	10	1.0	4597694
Total Beryllium (Be)	ug/L	<1.0	4599169	<1.0	<1.0	<1.0	4599379	<1.0	1.0	4597694
Total Bismuth (Bi)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Boron (B)	ug/L	<50	4599169	<50	<50	91	4599379	<50	50	4597694
Total Cadmium (Cd)	ug/L	<0.010	4599169	<0.010	<0.010	0.018	4599379	0.016	0.010	4597694
Total Calcium (Ca)	ug/L	55000	4599169	55000	27000	48000	4599379	18000	100	4597694
Total Chromium (Cr)	ug/L	<1.0	4599169	<1.0	<1.0	<1.0	4599379	<1.0	1.0	4597694
Total Cobalt (Co)	ug/L	<0.40	4599169	<0.40	<0.40	<0.40	4599379	<0.40	0.40	4597694
Total Copper (Cu)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Iron (Fe)	ug/L	300	4599169	180	640	350	4599379	970	50	4597694
Total Lead (Pb)	ug/L	<0.50	4599169	<0.50	<0.50	<0.50	4599379	0.61	0.50	4597694
Total Magnesium (Mg)	ug/L	5300	4599169	4700	3500	5600	4599379	2200	100	4597694
Total Manganese (Mn)	ug/L	140	4599169	37	71	350	4599379	47	2.0	4597694
Total Molybdenum (Mo)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Nickel (Ni)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Phosphorus (P)	ug/L	<100	4599169	<100	140	<100	4599379	<100	100	4597694
Total Potassium (K)	ug/L	2400	4599169	2400	1400	2900	4599379	690	100	4597694
Total Selenium (Se)	ug/L	<1.0	4599169	<1.0	<1.0	<1.0	4599379	<1.0	1.0	4597694
Total Silver (Ag)	ug/L	<0.10	4599169	<0.10	<0.10	<0.10	4599379	<0.10	0.10	4597694
Total Sodium (Na)	ug/L	34000	4599169	40000	27000	33000	4599379	20000	100	4597694
Total Strontium (Sr)	ug/L	270	4599169	300	160	170	4599379	52	2.0	4597694
Total Thallium (Tl)	ug/L	<0.10	4599169	<0.10	<0.10	<0.10	4599379	<0.10	0.10	4597694
Total Tin (Sn)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Titanium (Ti)	ug/L	<2.0	4599169	<2.0	5.6	2.1	4599379	<2.0	2.0	4597694
Total Uranium (U)	ug/L	0.32	4599169	0.30	<0.10	0.38	4599379	<0.10	0.10	4597694
Total Vanadium (V)	ug/L	<2.0	4599169	<2.0	<2.0	<2.0	4599379	<2.0	2.0	4597694
Total Zinc (Zn)	ug/L	<5.0	4599169	<5.0	<5.0	<5.0	4599379	<5.0	5.0	4597694

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		CTS233			CTS234			CTS236		
Sampling Date		2016/07/22			2016/07/22			2016/07/22		
COC Number		570825			570825			570825		
	UNITS	NARROWS	RDL	QC Batch	WB-1-SW	RDL	QC Batch	BP-1-SW	RDL	QC Batch
Metals										
Total Aluminum (Al)	ug/L	51	50	4599379	87	5.0	4599169	63	50	4599379
Total Antimony (Sb)	ug/L	<10	10	4599379	<1.0	1.0	4599169	<10	10	4599379
Total Arsenic (As)	ug/L	<10	10	4599379	<1.0	1.0	4599169	<10	10	4599379
Total Barium (Ba)	ug/L	28	10	4599379	39	1.0	4599169	23	10	4599379
Total Beryllium (Be)	ug/L	<10	10	4599379	<1.0	1.0	4599169	<10	10	4599379
Total Bismuth (Bi)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Boron (B)	ug/L	3500	500	4599379	690	50	4599169	3600	500	4599379
Total Cadmium (Cd)	ug/L	<0.10	0.10	4599379	0.035	0.010	4599169	<0.10	0.10	4599379
Total Calcium (Ca)	ug/L	300000	1000	4599379	79000	100	4599169	300000	1000	4599379
Total Chromium (Cr)	ug/L	<10	10	4599379	<1.0	1.0	4599169	<10	10	4599379
Total Cobalt (Co)	ug/L	<4.0	4.0	4599379	<0.40	0.40	4599169	<4.0	4.0	4599379
Total Copper (Cu)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Iron (Fe)	ug/L	<500	500	4599379	590	50	4599169	<500	500	4599379
Total Lead (Pb)	ug/L	<5.0	5.0	4599379	0.56	0.50	4599169	<5.0	5.0	4599379
Total Magnesium (Mg)	ug/L	900000	1000	4599379	190000	1000	4599169	910000	1000	4599379
Total Manganese (Mn)	ug/L	120	20	4599379	160	2.0	4599169	71	20	4599379
Total Molybdenum (Mo)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Nickel (Ni)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Phosphorus (P)	ug/L	<1000	1000	4599379	<100	100	4599169	<1000	1000	4599379
Total Potassium (K)	ug/L	270000	1000	4599379	54000	100	4599169	280000	1000	4599379
Total Selenium (Se)	ug/L	<10	10	4599379	<1.0	1.0	4599169	<10	10	4599379
Total Silver (Ag)	ug/L	<1.0	1.0	4599379	<0.10	0.10	4599169	<1.0	1.0	4599379
Total Sodium (Na)	ug/L	7500000	1000	4599379	1600000	1000	4599169	7500000	1000	4599379
Total Strontium (Sr)	ug/L	5400	20	4599379	1300	2.0	4599169	5500	20	4599379
Total Thallium (Tl)	ug/L	<1.0	1.0	4599379	<0.10	0.10	4599169	<1.0	1.0	4599379
Total Tin (Sn)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Titanium (Ti)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Uranium (U)	ug/L	2.1	1.0	4599379	0.47	0.10	4599169	2.4	1.0	4599379
Total Vanadium (V)	ug/L	<20	20	4599379	<2.0	2.0	4599169	<20	20	4599379
Total Zinc (Zn)	ug/L	<50	50	4599379	11	5.0	4599169	<50	50	4599379
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		CTS237		
Sampling Date		2016/07/22		
COC Number		570825		
	UNITS	FD-011	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	42	5.0	4599379
Total Antimony (Sb)	ug/L	<1.0	1.0	4599379
Total Arsenic (As)	ug/L	<1.0	1.0	4599379
Total Barium (Ba)	ug/L	26	1.0	4599379
Total Beryllium (Be)	ug/L	<1.0	1.0	4599379
Total Bismuth (Bi)	ug/L	<2.0	2.0	4599379
Total Boron (B)	ug/L	<50	50	4599379
Total Cadmium (Cd)	ug/L	<0.010	0.010	4599379
Total Calcium (Ca)	ug/L	55000	100	4599379
Total Chromium (Cr)	ug/L	<1.0	1.0	4599379
Total Cobalt (Co)	ug/L	<0.40	0.40	4599379
Total Copper (Cu)	ug/L	2.0	2.0	4599379
Total Iron (Fe)	ug/L	310	50	4599379
Total Lead (Pb)	ug/L	<0.50	0.50	4599379
Total Magnesium (Mg)	ug/L	5700	100	4599379
Total Manganese (Mn)	ug/L	140	2.0	4599379
Total Molybdenum (Mo)	ug/L	<2.0	2.0	4599379
Total Nickel (Ni)	ug/L	<2.0	2.0	4599379
Total Phosphorus (P)	ug/L	<100	100	4599379
Total Potassium (K)	ug/L	2500	100	4599379
Total Selenium (Se)	ug/L	<1.0	1.0	4599379
Total Silver (Ag)	ug/L	<0.10	0.10	4599379
Total Sodium (Na)	ug/L	36000	100	4599379
Total Strontium (Sr)	ug/L	280	2.0	4599379
Total Thallium (Tl)	ug/L	<0.10	0.10	4599379
Total Tin (Sn)	ug/L	<2.0	2.0	4599379
Total Titanium (Ti)	ug/L	<2.0	2.0	4599379
Total Uranium (U)	ug/L	0.33	0.10	4599379
Total Vanadium (V)	ug/L	<2.0	2.0	4599379
Total Zinc (Zn)	ug/L	<5.0	5.0	4599379
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		CTS203	CTS226	CTS227	CTS231	CTS232	CTS233	CTS234		
Sampling Date		2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22	2016/07/22		
COC Number		570825	570825	570825	570825	570825	570825	570825		
	UNITS	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	NRC-1-SW	NARROWS	WB-1-SW	RDL	QC Batch

Polyaromatic Hydrocarbons

1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4597487
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4597487
Acenaphthene	ug/L	0.016	0.014	0.11	<0.010	0.028	0.024	0.019	0.010	4597487
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	0.010	4597487
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	0.021	<0.010	<0.010	0.010	4597487
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4597487
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	0.010	4597487
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.029	0.010	4597487
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.010	4597487
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	0.010	4597487
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	0.010	4597487
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.15	0.010	4597487
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4597487
Fluoranthene	ug/L	<0.010	<0.010	0.025	<0.010	<0.010	0.012	0.16	0.010	4597487
Fluorene	ug/L	0.011	<0.010	0.051	<0.010	0.014	0.021	0.011	0.010	4597487
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.010	4597487
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4597487
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4597487
Phenanthrene	ug/L	<0.010	<0.010	0.050	<0.010	0.018	0.016	0.070	0.010	4597487
Pyrene	ug/L	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	0.092	0.010	4597487

Surrogate Recovery (%)

D10-Anthracene	%	66	62	55	74	72	63	64		4597487
D14-Terphenyl	%	64	65	65	66	81	74	76		4597487
D8-Acenaphthylene	%	65	63	65	67	75	64	72		4597487

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		CTS236	CTS237	CTS247		
Sampling Date		2016/07/22	2016/07/22	2016/07/22		
COC Number		570825	570825	570825		
	UNITS	BP-1-SW	FD-011	TB-012	RDL	QC Batch
Polyaromatic Hydrocarbons						
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	0.050	4597487
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	0.050	4597487
Acenaphthene	ug/L	0.014	0.018	<0.010	0.010	4597487
Acenaphthylene	ug/L	0.016	<0.010	<0.010	0.010	4597487
Anthracene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Chrysene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Fluoranthene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Fluorene	ug/L	0.015	0.012	<0.010	0.010	4597487
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Naphthalene	ug/L	<0.20	<0.20	<0.20	0.20	4597487
Perylene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Phenanthrene	ug/L	0.012	<0.010	<0.010	0.010	4597487
Pyrene	ug/L	<0.010	<0.010	<0.010	0.010	4597487
Surrogate Recovery (%)						
D10-Anthracene	%	64	56	107		4597487
D14-Terphenyl	%	77	69	106		4597487
D8-Acenaphthylene	%	69	68	93		4597487
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

GENERAL COMMENTS

Sample CTS233-01 : Elevated reporting limits for trace metals due to sample matrix.

Poor RCap Ion Balance due to sample matrix.

Sample CTS236-01 : Elevated reporting limits for trace metals due to sample matrix.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4597404	ARS	Matrix Spike	Total Mercury (Hg)	2016/07/28		101	%	80 - 120
4597404	ARS	Spiked Blank	Total Mercury (Hg)	2016/07/28		102	%	80 - 120
4597404	ARS	Method Blank	Total Mercury (Hg)	2016/07/28	<0.013		ug/L	
4597404	ARS	RPD	Total Mercury (Hg)	2016/07/28	NC		%	20
4597487	KKE	Matrix Spike [CTS203-04]	D10-Anthracene	2016/08/03		69	%	30 - 130
			D14-Terphenyl	2016/08/03		67	%	30 - 130
			D8-Acenaphthylene	2016/08/03		68	%	30 - 130
			1-Methylnaphthalene	2016/08/03		60	%	30 - 130
			2-Methylnaphthalene	2016/08/03		63	%	30 - 130
			Acenaphthene	2016/08/03		69	%	30 - 130
			Acenaphthylene	2016/08/03		69	%	30 - 130
			Anthracene	2016/08/03		64	%	30 - 130
			Benzo(a)anthracene	2016/08/03		66	%	30 - 130
			Benzo(a)pyrene	2016/08/03		63	%	30 - 130
			Benzo(b)fluoranthene	2016/08/03		63	%	30 - 130
			Benzo(g,h,i)perylene	2016/08/03		70	%	30 - 130
			Benzo(j)fluoranthene	2016/08/03		56	%	30 - 130
			Benzo(k)fluoranthene	2016/08/03		60	%	30 - 130
			Chrysene	2016/08/03		63	%	30 - 130
			Dibenz(a,h)anthracene	2016/08/03		67	%	30 - 130
			Fluoranthene	2016/08/03		68	%	30 - 130
			Fluorene	2016/08/03		69	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/08/03		70	%	30 - 130
			Naphthalene	2016/08/03		60	%	30 - 130
			Perylene	2016/08/03		58	%	30 - 130
			Phenanthrene	2016/08/03		71	%	30 - 130
			Pyrene	2016/08/03		71	%	30 - 130
4597487	KKE	Spiked Blank	D10-Anthracene	2016/08/03		72	%	30 - 130
			D14-Terphenyl	2016/08/03		90	%	30 - 130
			D8-Acenaphthylene	2016/08/03		94	%	30 - 130
			1-Methylnaphthalene	2016/08/03		80	%	30 - 130
			2-Methylnaphthalene	2016/08/03		82	%	30 - 130
			Acenaphthene	2016/08/03		86	%	30 - 130
			Acenaphthylene	2016/08/03		89	%	30 - 130
			Anthracene	2016/08/03		84	%	30 - 130
			Benzo(a)anthracene	2016/08/03		82	%	30 - 130
			Benzo(a)pyrene	2016/08/03		81	%	30 - 130
			Benzo(b)fluoranthene	2016/08/03		76	%	30 - 130
			Benzo(g,h,i)perylene	2016/08/03		89	%	30 - 130
			Benzo(j)fluoranthene	2016/08/03		73	%	30 - 130
			Benzo(k)fluoranthene	2016/08/03		82	%	30 - 130
			Chrysene	2016/08/03		76	%	30 - 130
			Dibenz(a,h)anthracene	2016/08/03		79	%	30 - 130
			Fluoranthene	2016/08/03		87	%	30 - 130
			Fluorene	2016/08/03		91	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2016/08/03		90	%	30 - 130
			Naphthalene	2016/08/03		77	%	30 - 130
			Perylene	2016/08/03		74	%	30 - 130
			Phenanthrene	2016/08/03		94	%	30 - 130
			Pyrene	2016/08/03		89	%	30 - 130
4597487	KKE	Method Blank	D10-Anthracene	2016/08/03		94	%	30 - 130
			D14-Terphenyl	2016/08/03		98	%	30 - 130
			D8-Acenaphthylene	2016/08/03		98	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1-Methylnaphthalene	2016/08/03	<0.050		ug/L	
			2-Methylnaphthalene	2016/08/03	<0.050		ug/L	
			Acenaphthene	2016/08/03	<0.010		ug/L	
			Acenaphthylene	2016/08/03	<0.010		ug/L	
			Anthracene	2016/08/03	<0.010		ug/L	
			Benzo(a)anthracene	2016/08/03	<0.010		ug/L	
			Benzo(a)pyrene	2016/08/03	<0.010		ug/L	
			Benzo(b)fluoranthene	2016/08/03	<0.010		ug/L	
			Benzo(g,h,i)perylene	2016/08/03	<0.010		ug/L	
			Benzo(j)fluoranthene	2016/08/03	<0.010		ug/L	
			Benzo(k)fluoranthene	2016/08/03	<0.010		ug/L	
			Chrysene	2016/08/03	<0.010		ug/L	
			Dibenz(a,h)anthracene	2016/08/03	<0.010		ug/L	
			Fluoranthene	2016/08/03	<0.010		ug/L	
			Fluorene	2016/08/03	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2016/08/03	<0.010		ug/L	
			Naphthalene	2016/08/03	<0.20		ug/L	
			Perylene	2016/08/03	<0.010		ug/L	
			Phenanthrene	2016/08/03	<0.010		ug/L	
			Pyrene	2016/08/03	<0.010		ug/L	
4597487	KKE	RPD	1-Methylnaphthalene	2016/08/03	NC		%	40
			2-Methylnaphthalene	2016/08/03	NC		%	40
			Acenaphthene	2016/08/03	NC		%	40
			Acenaphthylene	2016/08/03	NC		%	40
			Anthracene	2016/08/03	NC		%	40
			Benzo(a)anthracene	2016/08/03	NC		%	40
			Benzo(a)pyrene	2016/08/03	NC		%	40
			Benzo(b)fluoranthene	2016/08/03	NC		%	40
			Benzo(g,h,i)perylene	2016/08/03	NC		%	40
			Benzo(j)fluoranthene	2016/08/03	NC		%	40
			Benzo(k)fluoranthene	2016/08/03	NC		%	40
			Chrysene	2016/08/03	NC		%	40
			Dibenz(a,h)anthracene	2016/08/03	NC		%	40
			Fluoranthene	2016/08/03	NC		%	40
			Fluorene	2016/08/03	NC		%	40
			Indeno(1,2,3-cd)pyrene	2016/08/03	NC		%	40
			Naphthalene	2016/08/03	NC		%	40
			Perylene	2016/08/03	NC		%	40
			Phenanthrene	2016/08/03	NC		%	40
			Pyrene	2016/08/03	NC		%	40
4597694	BAN	Matrix Spike	Total Aluminum (Al)	2016/07/28		110	%	80 - 120
			Total Antimony (Sb)	2016/07/28		102	%	80 - 120
			Total Arsenic (As)	2016/07/28		100	%	80 - 120
			Total Barium (Ba)	2016/07/28		102	%	80 - 120
			Total Beryllium (Be)	2016/07/28		102	%	80 - 120
			Total Bismuth (Bi)	2016/07/28		107	%	80 - 120
			Total Boron (B)	2016/07/28		101	%	80 - 120
			Total Cadmium (Cd)	2016/07/28		104	%	80 - 120
			Total Calcium (Ca)	2016/07/28		104	%	80 - 120
			Total Chromium (Cr)	2016/07/28		101	%	80 - 120
			Total Cobalt (Co)	2016/07/28		101	%	80 - 120
			Total Copper (Cu)	2016/07/28		98	%	80 - 120
			Total Iron (Fe)	2016/07/28		NC	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Lead (Pb)	2016/07/28		103	%	80 - 120
			Total Magnesium (Mg)	2016/07/28		106	%	80 - 120
			Total Manganese (Mn)	2016/07/28		NC	%	80 - 120
			Total Molybdenum (Mo)	2016/07/28		105	%	80 - 120
			Total Nickel (Ni)	2016/07/28		103	%	80 - 120
			Total Phosphorus (P)	2016/07/28		107	%	80 - 120
			Total Potassium (K)	2016/07/28		107	%	80 - 120
			Total Selenium (Se)	2016/07/28		104	%	80 - 120
			Total Silver (Ag)	2016/07/28		102	%	80 - 120
			Total Sodium (Na)	2016/07/28		103	%	80 - 120
			Total Strontium (Sr)	2016/07/28		103	%	80 - 120
			Total Thallium (Tl)	2016/07/28		104	%	80 - 120
			Total Tin (Sn)	2016/07/28		107	%	80 - 120
			Total Titanium (Ti)	2016/07/28		107	%	80 - 120
			Total Uranium (U)	2016/07/28		112	%	80 - 120
			Total Vanadium (V)	2016/07/28		102	%	80 - 120
			Total Zinc (Zn)	2016/07/28		100	%	80 - 120
4597694	BAN	Spiked Blank	Total Aluminum (Al)	2016/07/28		103	%	80 - 120
			Total Antimony (Sb)	2016/07/28		99	%	80 - 120
			Total Arsenic (As)	2016/07/28		96	%	80 - 120
			Total Barium (Ba)	2016/07/28		97	%	80 - 120
			Total Beryllium (Be)	2016/07/28		100	%	80 - 120
			Total Bismuth (Bi)	2016/07/28		102	%	80 - 120
			Total Boron (B)	2016/07/28		100	%	80 - 120
			Total Cadmium (Cd)	2016/07/28		98	%	80 - 120
			Total Calcium (Ca)	2016/07/28		102	%	80 - 120
			Total Chromium (Cr)	2016/07/28		97	%	80 - 120
			Total Cobalt (Co)	2016/07/28		97	%	80 - 120
			Total Copper (Cu)	2016/07/28		97	%	80 - 120
			Total Iron (Fe)	2016/07/28		104	%	80 - 120
			Total Lead (Pb)	2016/07/28		100	%	80 - 120
			Total Magnesium (Mg)	2016/07/28		102	%	80 - 120
			Total Manganese (Mn)	2016/07/28		100	%	80 - 120
			Total Molybdenum (Mo)	2016/07/28		101	%	80 - 120
			Total Nickel (Ni)	2016/07/28		100	%	80 - 120
			Total Phosphorus (P)	2016/07/28		103	%	80 - 120
			Total Potassium (K)	2016/07/28		103	%	80 - 120
			Total Selenium (Se)	2016/07/28		99	%	80 - 120
			Total Silver (Ag)	2016/07/28		96	%	80 - 120
			Total Sodium (Na)	2016/07/28		99	%	80 - 120
			Total Strontium (Sr)	2016/07/28		100	%	80 - 120
			Total Thallium (Tl)	2016/07/28		102	%	80 - 120
			Total Tin (Sn)	2016/07/28		101	%	80 - 120
			Total Titanium (Ti)	2016/07/28		101	%	80 - 120
			Total Uranium (U)	2016/07/28		107	%	80 - 120
			Total Vanadium (V)	2016/07/28		98	%	80 - 120
			Total Zinc (Zn)	2016/07/28		97	%	80 - 120
4597694	BAN	Method Blank	Total Aluminum (Al)	2016/07/28	6.3, RDL=5.0		ug/L	
			Total Antimony (Sb)	2016/07/28	<1.0		ug/L	
			Total Arsenic (As)	2016/07/28	<1.0		ug/L	
			Total Barium (Ba)	2016/07/28	<1.0		ug/L	
			Total Beryllium (Be)	2016/07/28	<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)	2016/07/28	<2.0		ug/L	
			Total Boron (B)	2016/07/28	<50		ug/L	
			Total Cadmium (Cd)	2016/07/28	<0.010		ug/L	
			Total Calcium (Ca)	2016/07/28	<100		ug/L	
			Total Chromium (Cr)	2016/07/28	<1.0		ug/L	
			Total Cobalt (Co)	2016/07/28	<0.40		ug/L	
			Total Copper (Cu)	2016/07/28	<2.0		ug/L	
			Total Iron (Fe)	2016/07/28	<50		ug/L	
			Total Lead (Pb)	2016/07/28	<0.50		ug/L	
			Total Magnesium (Mg)	2016/07/28	<100		ug/L	
			Total Manganese (Mn)	2016/07/28	<2.0		ug/L	
			Total Molybdenum (Mo)	2016/07/28	<2.0		ug/L	
			Total Nickel (Ni)	2016/07/28	<2.0		ug/L	
			Total Phosphorus (P)	2016/07/28	<100		ug/L	
			Total Potassium (K)	2016/07/28	<100		ug/L	
			Total Selenium (Se)	2016/07/28	<1.0		ug/L	
			Total Silver (Ag)	2016/07/28	<0.10		ug/L	
			Total Sodium (Na)	2016/07/28	<100		ug/L	
			Total Strontium (Sr)	2016/07/28	<2.0		ug/L	
			Total Thallium (Tl)	2016/07/28	<0.10		ug/L	
			Total Tin (Sn)	2016/07/28	<2.0		ug/L	
			Total Titanium (Ti)	2016/07/28	<2.0		ug/L	
			Total Uranium (U)	2016/07/28	<0.10		ug/L	
			Total Vanadium (V)	2016/07/28	<2.0		ug/L	
			Total Zinc (Zn)	2016/07/28	<5.0		ug/L	
4597694	BAN	RPD	Total Aluminum (Al)	2016/07/28	2.0		%	20
			Total Antimony (Sb)	2016/07/28	NC		%	20
			Total Arsenic (As)	2016/07/28	NC		%	20
			Total Barium (Ba)	2016/07/28	0.85		%	20
			Total Beryllium (Be)	2016/07/28	NC		%	20
			Total Bismuth (Bi)	2016/07/28	NC		%	20
			Total Boron (B)	2016/07/28	NC		%	20
			Total Cadmium (Cd)	2016/07/28	NC		%	20
			Total Calcium (Ca)	2016/07/28	0.78		%	20
			Total Chromium (Cr)	2016/07/28	NC		%	20
			Total Cobalt (Co)	2016/07/28	NC		%	20
			Total Copper (Cu)	2016/07/28	NC		%	20
			Total Iron (Fe)	2016/07/28	NC		%	20
			Total Lead (Pb)	2016/07/28	NC		%	20
			Total Magnesium (Mg)	2016/07/28	3.1		%	20
			Total Manganese (Mn)	2016/07/28	0.090		%	20
			Total Molybdenum (Mo)	2016/07/28	NC		%	20
			Total Nickel (Ni)	2016/07/28	NC		%	20
			Total Phosphorus (P)	2016/07/28	NC		%	20
			Total Potassium (K)	2016/07/28	0.31		%	20
			Total Selenium (Se)	2016/07/28	NC		%	20
			Total Silver (Ag)	2016/07/28	NC		%	20
			Total Sodium (Na)	2016/07/28	0.42		%	20
			Total Strontium (Sr)	2016/07/28	0.17		%	20
			Total Thallium (Tl)	2016/07/28	NC		%	20
			Total Tin (Sn)	2016/07/28	NC		%	20
			Total Titanium (Ti)	2016/07/28	NC		%	20
			Total Uranium (U)	2016/07/28	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Vanadium (V)	2016/07/28	NC		%	20
			Total Zinc (Zn)	2016/07/28	NC		%	20
4598192	MCN	Matrix Spike [CTS227-03]	Nitrogen (Ammonia Nitrogen)	2016/08/02		107	%	80 - 120
4598192	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2016/08/03		107	%	80 - 120
4598192	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2016/08/02	<0.050		mg/L	
4598192	MCN	RPD [CTS227-03]	Nitrogen (Ammonia Nitrogen)	2016/08/02	NC		%	20
4599154	JMV	QC Standard	pH	2016/07/29		100	%	97 - 103
4599154	JMV	RPD	pH	2016/07/29	1.8		%	N/A
4599155	JMV	Spiked Blank	Conductivity	2016/07/29		99	%	80 - 120
4599155	JMV	Method Blank	Conductivity	2016/07/29	1.4, RDL=1.0		uS/cm	
4599155	JMV	RPD	Conductivity	2016/07/29	0.53		%	25
4599156	JMV	QC Standard	pH	2016/07/29		100	%	97 - 103
4599156	JMV	RPD	pH	2016/07/29	1.5		%	N/A
4599157	JMV	Spiked Blank	Conductivity	2016/07/29		99	%	80 - 120
4599157	JMV	Method Blank	Conductivity	2016/07/29	1.4, RDL=1.0		uS/cm	
4599157	JMV	RPD	Conductivity	2016/07/29	0.68		%	25
4599169	BAN	Matrix Spike	Total Aluminum (Al)	2016/08/02		103	%	80 - 120
			Total Antimony (Sb)	2016/08/02		113	%	80 - 120
			Total Arsenic (As)	2016/08/02		101	%	80 - 120
			Total Barium (Ba)	2016/08/02		106	%	80 - 120
			Total Beryllium (Be)	2016/08/02		110	%	80 - 120
			Total Bismuth (Bi)	2016/08/02		98	%	80 - 120
			Total Boron (B)	2016/08/02		NC	%	80 - 120
			Total Cadmium (Cd)	2016/08/02		102	%	80 - 120
			Total Calcium (Ca)	2016/08/02		NC	%	80 - 120
			Total Chromium (Cr)	2016/08/02		102	%	80 - 120
			Total Cobalt (Co)	2016/08/02		99	%	80 - 120
			Total Copper (Cu)	2016/08/02		93	%	80 - 120
			Total Iron (Fe)	2016/08/02		NC	%	80 - 120
			Total Lead (Pb)	2016/08/02		100	%	80 - 120
			Total Magnesium (Mg)	2016/08/02		NC	%	80 - 120
			Total Manganese (Mn)	2016/08/02		NC	%	80 - 120
			Total Molybdenum (Mo)	2016/08/02		114	%	80 - 120
			Total Nickel (Ni)	2016/08/02		94	%	80 - 120
			Total Phosphorus (P)	2016/08/02		108	%	80 - 120
			Total Potassium (K)	2016/08/02		NC	%	80 - 120
			Total Selenium (Se)	2016/08/02		100	%	80 - 120
			Total Silver (Ag)	2016/08/02		101	%	80 - 120
			Total Sodium (Na)	2016/08/02		NC	%	80 - 120
			Total Strontium (Sr)	2016/08/02		NC	%	80 - 120
			Total Thallium (Tl)	2016/08/02		101	%	80 - 120
			Total Tin (Sn)	2016/08/02		115	%	80 - 120
			Total Titanium (Ti)	2016/08/02		111	%	80 - 120
			Total Uranium (U)	2016/08/02		106	%	80 - 120
			Total Vanadium (V)	2016/08/02		108	%	80 - 120
			Total Zinc (Zn)	2016/08/02		94	%	80 - 120
4599169	BAN	Spiked Blank	Total Aluminum (Al)	2016/07/29		100	%	80 - 120
			Total Antimony (Sb)	2016/07/29		96	%	80 - 120
			Total Arsenic (As)	2016/07/29		96	%	80 - 120
			Total Barium (Ba)	2016/07/29		97	%	80 - 120
			Total Beryllium (Be)	2016/07/29		106	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2016/07/29		98	%	80 - 120
			Total Boron (B)	2016/07/29		109	%	80 - 120
			Total Cadmium (Cd)	2016/07/29		99	%	80 - 120
			Total Calcium (Ca)	2016/07/29		100	%	80 - 120
			Total Chromium (Cr)	2016/07/29		100	%	80 - 120
			Total Cobalt (Co)	2016/07/29		101	%	80 - 120
			Total Copper (Cu)	2016/07/29		100	%	80 - 120
			Total Iron (Fe)	2016/07/29		101	%	80 - 120
			Total Lead (Pb)	2016/07/29		98	%	80 - 120
			Total Magnesium (Mg)	2016/07/29		101	%	80 - 120
			Total Manganese (Mn)	2016/07/29		99	%	80 - 120
			Total Molybdenum (Mo)	2016/07/29		100	%	80 - 120
			Total Nickel (Ni)	2016/07/29		100	%	80 - 120
			Total Phosphorus (P)	2016/07/29		100	%	80 - 120
			Total Potassium (K)	2016/07/29		100	%	80 - 120
			Total Selenium (Se)	2016/07/29		100	%	80 - 120
			Total Silver (Ag)	2016/07/29		97	%	80 - 120
			Total Sodium (Na)	2016/07/29		101	%	80 - 120
			Total Strontium (Sr)	2016/07/29		97	%	80 - 120
			Total Thallium (Tl)	2016/07/29		99	%	80 - 120
			Total Tin (Sn)	2016/07/29		101	%	80 - 120
			Total Titanium (Ti)	2016/07/29		101	%	80 - 120
			Total Uranium (U)	2016/07/29		100	%	80 - 120
			Total Vanadium (V)	2016/07/29		102	%	80 - 120
			Total Zinc (Zn)	2016/07/29		97	%	80 - 120
4599169	BAN	Method Blank	Total Aluminum (Al)	2016/07/29	<5.0		ug/L	
			Total Antimony (Sb)	2016/07/29	<1.0		ug/L	
			Total Arsenic (As)	2016/07/29	<1.0		ug/L	
			Total Barium (Ba)	2016/07/29	<1.0		ug/L	
			Total Beryllium (Be)	2016/07/29	<1.0		ug/L	
			Total Bismuth (Bi)	2016/07/29	<2.0		ug/L	
			Total Boron (B)	2016/07/29	<50		ug/L	
			Total Cadmium (Cd)	2016/07/29	<0.010		ug/L	
			Total Calcium (Ca)	2016/07/29	<100		ug/L	
			Total Chromium (Cr)	2016/07/29	<1.0		ug/L	
			Total Cobalt (Co)	2016/07/29	<0.40		ug/L	
			Total Copper (Cu)	2016/07/29	<2.0		ug/L	
			Total Iron (Fe)	2016/07/29	<50		ug/L	
			Total Lead (Pb)	2016/07/29	<0.50		ug/L	
			Total Magnesium (Mg)	2016/07/29	<100		ug/L	
			Total Manganese (Mn)	2016/07/29	<2.0		ug/L	
			Total Molybdenum (Mo)	2016/07/29	<2.0		ug/L	
			Total Nickel (Ni)	2016/07/29	<2.0		ug/L	
			Total Phosphorus (P)	2016/07/29	<100		ug/L	
			Total Potassium (K)	2016/07/29	<100		ug/L	
			Total Selenium (Se)	2016/07/29	<1.0		ug/L	
			Total Silver (Ag)	2016/07/29	<0.10		ug/L	
			Total Sodium (Na)	2016/07/29	<100		ug/L	
			Total Strontium (Sr)	2016/07/29	<2.0		ug/L	
			Total Thallium (Tl)	2016/07/29	<0.10		ug/L	
			Total Tin (Sn)	2016/07/29	<2.0		ug/L	
			Total Titanium (Ti)	2016/07/29	<2.0		ug/L	
			Total Uranium (U)	2016/07/29	<0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4599169	BAN	RPD	Total Vanadium (V)	2016/07/29	<2.0		ug/L	
			Total Zinc (Zn)	2016/07/29	<5.0		ug/L	
			Total Aluminum (Al)	2016/07/29	NC		%	20
			Total Antimony (Sb)	2016/07/29	NC		%	20
			Total Arsenic (As)	2016/07/29	NC		%	20
			Total Barium (Ba)	2016/07/29	NC		%	20
			Total Beryllium (Be)	2016/07/29	NC		%	20
			Total Bismuth (Bi)	2016/07/29	NC		%	20
			Total Boron (B)	2016/07/29	NC		%	20
			Total Cadmium (Cd)	2016/07/29	NC		%	20
			Total Calcium (Ca)	2016/07/29	1.6		%	20
			Total Chromium (Cr)	2016/07/29	NC		%	20
			Total Cobalt (Co)	2016/07/29	NC		%	20
			Total Copper (Cu)	2016/07/29	NC		%	20
			Total Iron (Fe)	2016/07/29	NC		%	20
			Total Lead (Pb)	2016/07/29	NC		%	20
			Total Magnesium (Mg)	2016/07/29	2.3		%	20
			Total Manganese (Mn)	2016/07/29	1.1		%	20
			Total Molybdenum (Mo)	2016/07/29	NC		%	20
			Total Nickel (Ni)	2016/07/29	NC		%	20
			Total Phosphorus (P)	2016/07/29	NC		%	20
			Total Potassium (K)	2016/07/29	NC		%	20
			Total Selenium (Se)	2016/07/29	NC		%	20
			Total Silver (Ag)	2016/07/29	NC		%	20
			Total Sodium (Na)	2016/07/29	2.8		%	20
			Total Strontium (Sr)	2016/07/29	2.6		%	20
			Total Thallium (Tl)	2016/07/29	NC		%	20
Total Tin (Sn)	2016/07/29	NC		%	20			
Total Titanium (Ti)	2016/07/29	NC		%	20			
Total Uranium (U)	2016/07/29	NC		%	20			
Total Vanadium (V)	2016/07/29	NC		%	20			
Total Zinc (Zn)	2016/07/29	NC		%	20			
4599189	MCN	Matrix Spike [CTS226-01]	Total Alkalinity (Total as CaCO3)	2016/08/02		NC	%	80 - 120
4599189	MCN	Spiked Blank	Total Alkalinity (Total as CaCO3)	2016/08/02		105	%	80 - 120
4599189	MCN	Method Blank	Total Alkalinity (Total as CaCO3)	2016/08/02	<5.0		mg/L	
4599189	MCN	RPD [CTS226-01]	Total Alkalinity (Total as CaCO3)	2016/08/02	0.21		%	25
4599191	MCN	Matrix Spike [CTS226-01]	Dissolved Chloride (Cl)	2016/08/03		NC	%	80 - 120
4599191	MCN	QC Standard	Dissolved Chloride (Cl)	2016/08/03		111	%	N/A
4599191	MCN	Spiked Blank	Dissolved Chloride (Cl)	2016/08/03		97	%	80 - 120
4599191	MCN	Method Blank	Dissolved Chloride (Cl)	2016/08/03	<1.0		mg/L	
4599191	MCN	RPD [CTS226-01]	Dissolved Chloride (Cl)	2016/08/03	1.6		%	25
4599192	MCN	Matrix Spike [CTS226-01]	Dissolved Sulphate (SO4)	2016/08/04		NC	%	80 - 120
4599192	MCN	Spiked Blank	Dissolved Sulphate (SO4)	2016/08/04		104	%	80 - 120
4599192	MCN	Method Blank	Dissolved Sulphate (SO4)	2016/08/04	<2.0		mg/L	
4599192	MCN	RPD [CTS226-01]	Dissolved Sulphate (SO4)	2016/08/04	3.4		%	25
4599193	MCN	Matrix Spike [CTS226-01]	Reactive Silica (SiO2)	2016/08/02		NC	%	80 - 120
4599193	MCN	Spiked Blank	Reactive Silica (SiO2)	2016/08/02		99	%	80 - 120
4599193	MCN	Method Blank	Reactive Silica (SiO2)	2016/08/02	<0.50		mg/L	
4599193	MCN	RPD [CTS226-01]	Reactive Silica (SiO2)	2016/08/02	0.29		%	25
4599194	MCN	Spiked Blank	Colour	2016/08/04		100	%	80 - 120
4599194	MCN	Method Blank	Colour	2016/08/04	<5.0		TCU	
4599194	MCN	RPD [CTS226-01]	Colour	2016/08/04	NC		%	20
4599195	MCN	Matrix Spike [CTS226-01]	Orthophosphate (P)	2016/08/02		97	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4599195	MCN	Spiked Blank	Orthophosphate (P)	2016/08/02		104	%	80 - 120
4599195	MCN	Method Blank	Orthophosphate (P)	2016/08/02	<0.010		mg/L	
4599195	MCN	RPD [CTS226-01]	Orthophosphate (P)	2016/08/02	NC		%	25
4599196	MCN	Matrix Spike [CTS226-01]	Nitrate + Nitrite (N)	2016/08/03		100	%	80 - 120
4599196	MCN	Spiked Blank	Nitrate + Nitrite (N)	2016/08/03		103	%	80 - 120
4599196	MCN	Method Blank	Nitrate + Nitrite (N)	2016/08/03	<0.050		mg/L	
4599196	MCN	RPD [CTS226-01]	Nitrate + Nitrite (N)	2016/08/03	NC		%	25
4599197	MCN	Matrix Spike [CTS226-01]	Nitrite (N)	2016/08/03		91	%	80 - 120
4599197	MCN	Spiked Blank	Nitrite (N)	2016/08/03		97	%	80 - 120
4599197	MCN	Method Blank	Nitrite (N)	2016/08/03	<0.010		mg/L	
4599197	MCN	RPD [CTS226-01]	Nitrite (N)	2016/08/03	NC		%	25
4599379	BAN	Matrix Spike [CTS227-02]	Total Aluminum (Al)	2016/07/30		106	%	80 - 120
			Total Antimony (Sb)	2016/07/30		109	%	80 - 120
			Total Arsenic (As)	2016/07/30		101	%	80 - 120
			Total Barium (Ba)	2016/07/30		102	%	80 - 120
			Total Beryllium (Be)	2016/07/30		105	%	80 - 120
			Total Bismuth (Bi)	2016/07/30		103	%	80 - 120
			Total Boron (B)	2016/07/30		107	%	80 - 120
			Total Cadmium (Cd)	2016/07/30		102	%	80 - 120
			Total Calcium (Ca)	2016/07/30		NC	%	80 - 120
			Total Chromium (Cr)	2016/07/30		103	%	80 - 120
			Total Cobalt (Co)	2016/07/30		103	%	80 - 120
			Total Copper (Cu)	2016/07/30		100	%	80 - 120
			Total Iron (Fe)	2016/07/30		NC	%	80 - 120
			Total Lead (Pb)	2016/07/30		105	%	80 - 120
			Total Magnesium (Mg)	2016/07/30		100	%	80 - 120
			Total Manganese (Mn)	2016/07/30		NC	%	80 - 120
			Total Molybdenum (Mo)	2016/07/30		109	%	80 - 120
			Total Nickel (Ni)	2016/07/30		100	%	80 - 120
			Total Phosphorus (P)	2016/07/30		107	%	80 - 120
			Total Potassium (K)	2016/07/30		105	%	80 - 120
			Total Selenium (Se)	2016/07/30		100	%	80 - 120
			Total Silver (Ag)	2016/07/30		102	%	80 - 120
			Total Sodium (Na)	2016/07/30		NC	%	80 - 120
			Total Strontium (Sr)	2016/07/30		NC	%	80 - 120
			Total Thallium (Tl)	2016/07/30		104	%	80 - 120
			Total Tin (Sn)	2016/07/30		109	%	80 - 120
			Total Titanium (Ti)	2016/07/30		98	%	80 - 120
			Total Uranium (U)	2016/07/30		108	%	80 - 120
			Total Vanadium (V)	2016/07/30		106	%	80 - 120
			Total Zinc (Zn)	2016/07/30		100	%	80 - 120
4599379	BAN	Spiked Blank	Total Aluminum (Al)	2016/07/30		100	%	80 - 120
			Total Antimony (Sb)	2016/07/30		106	%	80 - 120
			Total Arsenic (As)	2016/07/30		90	%	80 - 120
			Total Barium (Ba)	2016/07/30		103	%	80 - 120
			Total Beryllium (Be)	2016/07/30		101	%	80 - 120
			Total Bismuth (Bi)	2016/07/30		103	%	80 - 120
			Total Boron (B)	2016/07/30		102	%	80 - 120
			Total Cadmium (Cd)	2016/07/30		96	%	80 - 120
			Total Calcium (Ca)	2016/07/30		101	%	80 - 120
			Total Chromium (Cr)	2016/07/30		95	%	80 - 120
			Total Cobalt (Co)	2016/07/30		94	%	80 - 120
			Total Copper (Cu)	2016/07/30		91	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Iron (Fe)	2016/07/30		97	%	80 - 120
			Total Lead (Pb)	2016/07/30		103	%	80 - 120
			Total Magnesium (Mg)	2016/07/30		93	%	80 - 120
			Total Manganese (Mn)	2016/07/30		97	%	80 - 120
			Total Molybdenum (Mo)	2016/07/30		102	%	80 - 120
			Total Nickel (Ni)	2016/07/30		93	%	80 - 120
			Total Phosphorus (P)	2016/07/30		96	%	80 - 120
			Total Potassium (K)	2016/07/30		101	%	80 - 120
			Total Selenium (Se)	2016/07/30		84	%	80 - 120
			Total Silver (Ag)	2016/07/30		96	%	80 - 120
			Total Sodium (Na)	2016/07/30		92	%	80 - 120
			Total Strontium (Sr)	2016/07/30		101	%	80 - 120
			Total Thallium (Tl)	2016/07/30		103	%	80 - 120
			Total Tin (Sn)	2016/07/30		109	%	80 - 120
			Total Titanium (Ti)	2016/07/30		100	%	80 - 120
			Total Uranium (U)	2016/07/30		103	%	80 - 120
			Total Vanadium (V)	2016/07/30		99	%	80 - 120
			Total Zinc (Zn)	2016/07/30		93	%	80 - 120
4599379	BAN	Method Blank	Total Aluminum (Al)	2016/07/30	<5.0		ug/L	
			Total Antimony (Sb)	2016/07/30	<1.0		ug/L	
			Total Arsenic (As)	2016/07/30	<1.0		ug/L	
			Total Barium (Ba)	2016/07/30	<1.0		ug/L	
			Total Beryllium (Be)	2016/07/30	<1.0		ug/L	
			Total Bismuth (Bi)	2016/07/30	<2.0		ug/L	
			Total Boron (B)	2016/07/30	<50		ug/L	
			Total Cadmium (Cd)	2016/07/30	<0.010		ug/L	
			Total Calcium (Ca)	2016/07/30	<100		ug/L	
			Total Chromium (Cr)	2016/07/30	<1.0		ug/L	
			Total Cobalt (Co)	2016/07/30	<0.40		ug/L	
			Total Copper (Cu)	2016/07/30	<2.0		ug/L	
			Total Iron (Fe)	2016/07/30	<50		ug/L	
			Total Lead (Pb)	2016/07/30	<0.50		ug/L	
			Total Magnesium (Mg)	2016/07/30	<100		ug/L	
			Total Manganese (Mn)	2016/07/30	<2.0		ug/L	
			Total Molybdenum (Mo)	2016/07/30	<2.0		ug/L	
			Total Nickel (Ni)	2016/07/30	<2.0		ug/L	
			Total Phosphorus (P)	2016/07/30	<100		ug/L	
			Total Potassium (K)	2016/07/30	<100		ug/L	
			Total Selenium (Se)	2016/07/30	<1.0		ug/L	
			Total Silver (Ag)	2016/07/30	<0.10		ug/L	
			Total Sodium (Na)	2016/07/30	<100		ug/L	
			Total Strontium (Sr)	2016/07/30	<2.0		ug/L	
			Total Thallium (Tl)	2016/07/30	<0.10		ug/L	
			Total Tin (Sn)	2016/07/30	<2.0		ug/L	
			Total Titanium (Ti)	2016/07/30	<2.0		ug/L	
			Total Uranium (U)	2016/07/30	<0.10		ug/L	
			Total Vanadium (V)	2016/07/30	<2.0		ug/L	
			Total Zinc (Zn)	2016/07/30	<5.0		ug/L	
4599379	BAN	RPD [CTS226-02]	Total Aluminum (Al)	2016/07/30	0.11		%	20
			Total Antimony (Sb)	2016/07/30	NC		%	20
			Total Arsenic (As)	2016/07/30	NC		%	20
			Total Barium (Ba)	2016/07/30	4.1		%	20
			Total Beryllium (Be)	2016/07/30	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

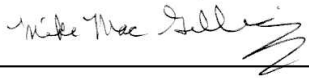
QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2016/07/30	NC		%	20
			Total Boron (B)	2016/07/30	NC		%	20
			Total Cadmium (Cd)	2016/07/30	NC		%	20
			Total Calcium (Ca)	2016/07/30	0.87		%	20
			Total Chromium (Cr)	2016/07/30	NC		%	20
			Total Cobalt (Co)	2016/07/30	NC		%	20
			Total Copper (Cu)	2016/07/30	NC		%	20
			Total Iron (Fe)	2016/07/30	NC		%	20
			Total Lead (Pb)	2016/07/30	NC		%	20
			Total Magnesium (Mg)	2016/07/30	1.7		%	20
			Total Manganese (Mn)	2016/07/30	0.67		%	20
			Total Molybdenum (Mo)	2016/07/30	NC		%	20
			Total Nickel (Ni)	2016/07/30	NC		%	20
			Total Phosphorus (P)	2016/07/30	NC		%	20
			Total Potassium (K)	2016/07/30	2.8		%	20
			Total Selenium (Se)	2016/07/30	NC		%	20
			Total Silver (Ag)	2016/07/30	NC		%	20
			Total Sodium (Na)	2016/07/30	1.1		%	20
			Total Strontium (Sr)	2016/07/30	1.4		%	20
			Total Thallium (Tl)	2016/07/30	NC		%	20
			Total Tin (Sn)	2016/07/30	NC		%	20
			Total Titanium (Ti)	2016/07/30	NC		%	20
			Total Uranium (U)	2016/07/30	NC		%	20
			Total Vanadium (V)	2016/07/30	NC		%	20
			Total Zinc (Zn)	2016/07/30	NC		%	20
4599430	JMV	QC Standard	Turbidity	2016/07/29		103	%	80 - 120
4599430	JMV	Spiked Blank	Turbidity	2016/07/29		101	%	80 - 120
4599430	JMV	Method Blank	Turbidity	2016/07/29	<0.10		NTU	
4599430	JMV	RPD	Turbidity	2016/07/29	13		%	20
4599434	JMV	QC Standard	Turbidity	2016/07/29		103	%	80 - 120
4599434	JMV	Spiked Blank	Turbidity	2016/07/29		101	%	80 - 120
4599434	JMV	Method Blank	Turbidity	2016/07/29	<0.10		NTU	
4599434	JMV	RPD [CTS226-01]	Turbidity	2016/07/29	1.0		%	20
4599459	JMV	QC Standard	Turbidity	2016/07/29		102	%	80 - 120
4599459	JMV	Spiked Blank	Turbidity	2016/07/29		101	%	80 - 120
4599459	JMV	Method Blank	Turbidity	2016/07/29	<0.10		NTU	
4599459	JMV	RPD	Turbidity	2016/07/29	1.1		%	20
4599588	SMT	Matrix Spike	Total Organic Carbon (C)	2016/07/29		95	%	80 - 120
4599588	SMT	Spiked Blank	Total Organic Carbon (C)	2016/07/29		111	%	80 - 120
4599588	SMT	Method Blank	Total Organic Carbon (C)	2016/07/29	<0.50		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4599588	SMT	RPD	Total Organic Carbon (C)	2016/07/29	14		%	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>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</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 spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of 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 (one or both samples < 5x RDL).</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)



Rosemarie MacDonald, Scientific Specialist (Organics)

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.