



June 11, 2015

Nova Scotia Lands
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Sydney, Nova Scotia
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ATTENTION: Mr. Frank Potter
Executive Director

***Long Term Maintenance and Monitoring
Semi-Annual Surface Water Quality Monitoring Program December 2014 Final Report***

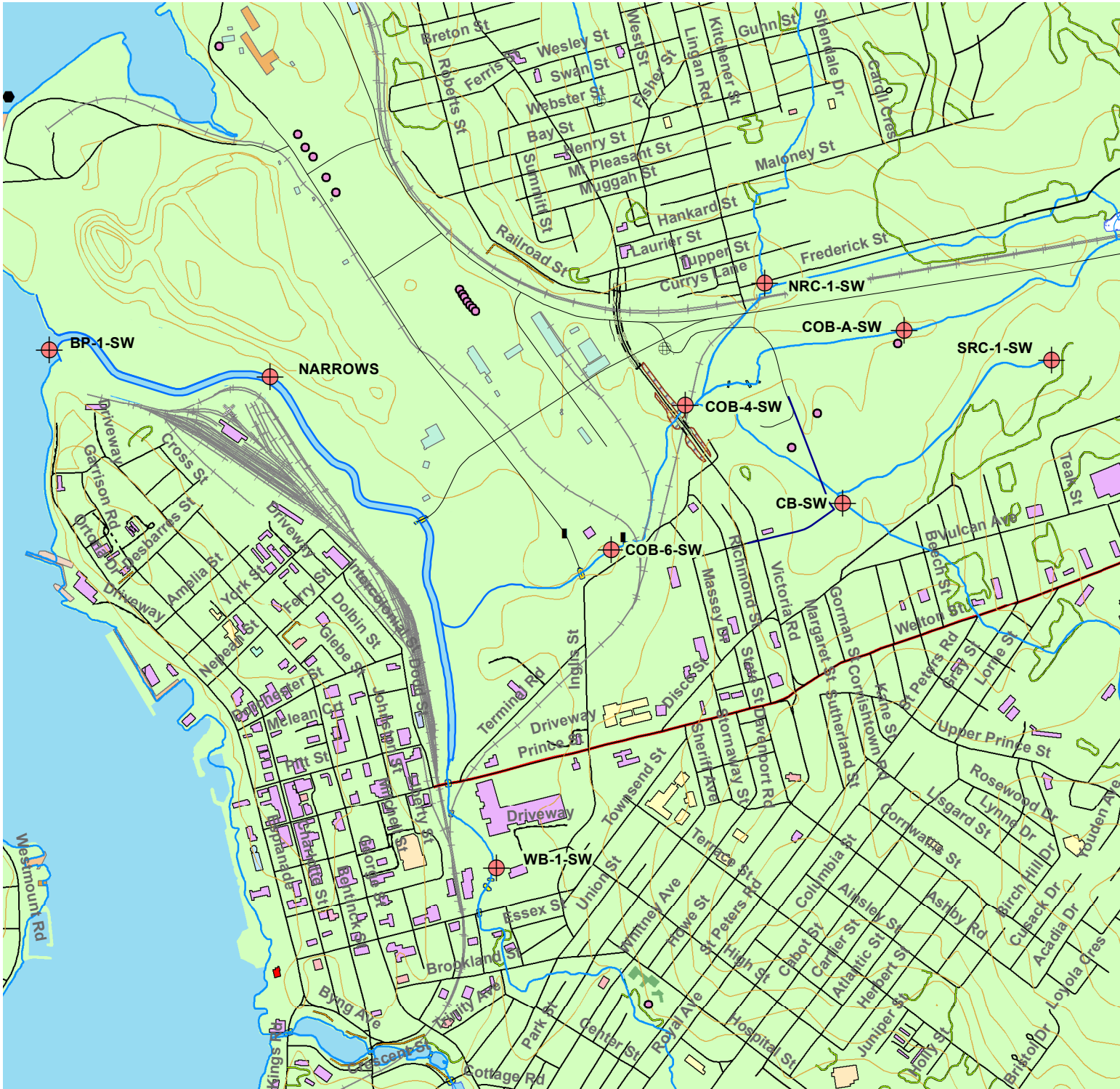
Surface water quality monitoring is an important component of long term maintenance and monitoring (LTMM), which has been implemented to provide ongoing data for design elements and compliance commitments to regulatory agencies and/or stakeholders. Nova Scotia Lands Incorporated (NS Lands) is a Crown 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 December 2014 LTMM program, the details of which are provided herein.

PROJECT METHODOLOGY

The December 2014 Surface Water Quality Monitoring program consisted of the collection of surface water samples at nine stations (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-4-SW, COB-6-SW, WB-1-SW, Narrows and BP-1-SW) on December 22, 2014 (**Figure 1**). A GPS unit was utilized 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., Environmental Effects Monitoring (EEM) Program). Tasks associated with the December 2014 surface water monitoring included:

- Recording of observed changes in surface water quality including documentation of 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, salinity and turbidity) with a calibrated Horiba U-22 multi-probe;
- Manual flow measurements; and,
- Collection of surface water samples from each station for petroleum hydrocarbons (PHC), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), general chemistry and total metals (including mercury) (RCaPMS) analysis.

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LONG TERM MAINTENANCE AND MONITORING
 SURFACE WATER QUALITY MONITORING PROGRAM
 DECEMBER 2014

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_GA\DILLON_DFS\SYDNEY
 \SYDNEYCAD\GIS\141360



PROJECT: 11-1234
 STATUS: DRAFT
 DATE: 01/30/15



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 $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ width intervals. The stream flow velocity was also measured at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ 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. A summary of the surface water stations included in the December 2014 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	CO7/CO8 (upstream)
NRC-1-SW	North Realigned Channel	CO7/CO8 (upstream)
SRC-1-SW	South Realigned Channel	CO7/CO8 (upstream)
COB-A-SW	Coke Ovens Brook – concrete riffles upstream of Stable Drive	CO1 (upstream) CO6 (upstream) CO7/CO8 (upstream)
COB-4-SW	Coke Ovens Brook	CO1 (downstream) CO6 (downstream) CO7/CO8 (downstream) TP6B (upstream of channel)
COB-6-SW	Coke Ovens Brook	CO1 (downstream) CO6 (downstream) CO7/CO8 (downstream) TP6B (upstream of channel)
WB-1-SW	Wash Brook	TP6B (upstream of channel) TP7 (upstream of channel)
NARROWS	North Channel, Open Hearth Park	Downstream
BP-1-SW ¹	Battery Point	TP6A TP6B TP7 CO7/CO8
Note:		
¹ The December 2014 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.		

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 of 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 samples were preserved with nitric acid in the field to ensure that the metals remained in solution.



FIELD OBSERVATIONS AND MEASUREMENTS

Observations at the nine surface water stations during the December 2014 monitoring program are summarized in **Table 2**. Field measurements are summarized in **Table 3**.

Monitoring Station ID	Field Observations
CB-SW	Vegetation observed within the brook. Debris (i.e., metal and plastic) observed within the brook and on the brook banks.
NRC-1-SW	Ducks observed. Debris (i.e., plastic) observed in the channel and on channel banks.
SRC-1-SW	Algae growth observed in the concrete channel. No debris observed.
COB-A-SW	Vegetation observed in the brook. Debris (i.e., Styrofoam) observed in the brook.
COB-4-SW	Algae growth observed in the brook. Debris (i.e., plastic and cardboard) observed in the brook and on the brook banks. Visible orange staining observed on nearby upstream concrete culvert.
COB-6-SW	Debris (i.e., paper and plastic) observed on brook banks.
WB-1-SW	Debris (i.e., metal, glass, concrete and plastic) observed within the brook and on the brook banks.
NARROWS	Ducks observed in the channel and on the channel banks. Algae observed within the channel. Debris (i.e., wood and glass) observed on the channel banks.
BP-1-SW	Sampling conducted at low tide. Algae and seaweed observed on exposed shoreline rocks. Seabirds visible in water and on shoreline.

Monitoring Station ID	pH	Turbidity (NTU)	Conductivity (mS/cm)	Salinity (%)	Stream Flow ¹ (m ³ /s)
CB-SW	7.73	53.0	0.219	0	0.01
NRC-1-SW	8.50	78.6	0.126	0	0.062
SRC-1-SW	7.36	80.7	0.356	0	0.024
COB-A-SW	7.36	43.9	0.511	0	0.004
COB-4-SW	7.11	60.4	0.247	0	0.15
COB-6-SW	7.73	24.3	0.282	0	0.19
WB-1-SW	7.45	25.3	0.102	0	0.07
NARROWS	8.69	123	8.09	0.4	7.85 ³
BP-1-SW ²	8.19	44	1.01	0.4	5.0 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 during December 22, 2014, there is some difference in the calculated flow rates due to tidal fluctuation. Both locations were monitored during the afternoon portion of the field program.



REGULATORY FRAME WORK

As specified in section 4.2, page 21 of the NS Lands LTMM Plan, the remedial criteria used for seven of the nine surface water stations included in the December 2014 monitoring program (i.e., CB-SW, NRC-1-SW, SRC-1-SW, COB-A-SW, COB-4-SW, COB-6-SW and WB-1-SW) were the July 2013 Nova Scotia Contaminated Sites Regulations (NSCSR) Tier I Environmental Quality Standards (EQS) for surface water (freshwater) and the Canadian Council of Ministers of the Environment (CCME) for the protection of freshwater aquatic life (FWAL), 2014. Analytical results for the remaining two surface water stations included in the December 2014 monitoring program (i.e., Narrows and BP-1-SW) were compared to the July 2013 NSCSR Tier I EQS for surface water (marine) and the CCME guidelines for the protection of aquatic life (marine), 2014.

Additionally, as specified in section 4.2, page 21 of the NS Lands LTMM Plan, analytical results for surface water samples collected at the seven upstream sampling stations were compared to previously calculated 95% upper confidence limits (UCL) of available Pre-Construction/Baseline analytical data from the Environmental Effects Monitoring and Surface Water Compliance Monitoring Program (EEMSWCM) associated with the Sydney Tar Ponds remediation. Furthermore, analytical results for the seven upstream sampling stations were also compared to calculated 95% UCLs of available historical upstream analytical data. 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 RESULTS

The surface water quality sample results for the December 2014 event and available post-remediation surface water data are presented in the attached **Tables A-1, A-2, A-3 and A-4** in **Appendix A**. Surface water samples were analyzed for PHCs, PAHs, PCBs and RCAPMS. Samples were delivered to the Canadian Association for Laboratory Accreditation (CALA) certified laboratory Maxxam in Sydney, Nova Scotia who were contracted directly by NL Lands to conduct the sample analysis. Review of the data indicates:

- Petroleum hydrocarbons were not detected in the nine surface water samples analyzed;
- Detectable concentrations of PAH parameters were reported for eight of the nine surface water stations sampled. The pyrene concentration of 0.030 ug/L at the Narrows and 0.036 ug/L at BP-1-SW exceeded the Tier I EQS (marine) of 0.02 ug/L. None of the detected concentrations exceed the calculated 95% UCLs; and,
- PCBs were not detected in the nine surface water samples analyzed.

A summary of concentrations of select organic parameters (PAHs) at each station recorded during the December 2014 event relative to the calculated 95% UCLs is provided in **Table 4**.



Table 4 - Summary of Organic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs - December 22, 2014 (ug/L)										
Parameter	95% UCL ¹	Sample Location								
		CB-SW	NRC-1-SW	SRC-1-SW	COB-A-SW	COB-4-SW	COB-6-SW	WE-1-SW	NARROWS	BP-1-SW
Naphthalene	1.8	<0.02	<0.02	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20
Benzo (a) pyrene	0.05	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Note:
¹Pre-Construction/Baseline Calculated 95% UCL from the EEMSWCM Program
Bold indicates the concentration exceeds the 95% UCL

Surface water samples were also analyzed for general chemistry and metals (including mercury). Review of the data includes:

- Concentrations of aluminum ranging from 16 ug/L to 350 ug/L exceed the Tier I EQS (freshwater) of 5 ug/L in CB-SW, NRC-1-SW, SRC-1-SW (and its field duplicate sample), COB-A-SW, COB-4-SW, COB-6-SW and WB-1-SW. The CCME FWAL of 100 ug/L for aluminum was also exceeded at CB-SW, SRC-1-SW (and its field duplicate sample) and WB-1-SW. Concentrations of aluminum in SRC-1-SW (and its field duplicate sample) are also above the respective Upstream 95% UCL of 200 ug/L;
- Concentrations of cadmium ranging from 0.014 ug/L to 0.038 ug/L exceeded the Tier I EQS (freshwater) of 0.01 ug/L at CB-SW, NRC-1-SW, SRC-1-SW (and its field duplicate sample), COB-4-SW and WB-1-SW;
- The copper concentrations of 2.6 ug/L and 2.8 ug/L at SRC-1-SW and its field duplicate sample, respectively, exceed the Tier I EQS (freshwater) of 2.0 ug/L.
- The concentrations of 340 ug/L and 350 ug/L for iron in SRC-1-SW and its field duplicate sample, respectively, exceed the Tier I EQS (freshwater) and CCME FWAL guideline of 300 ug/L. Additionally, the concentrations of 250 ug/L and 240 ug/L for iron at Narrows and BP-1-SW and, respectively, are above the Battery Point/Narrows calculated 95% UCL of 190 ug/L;
- The lead concentration of 1.2 ug/L in SRC-1-SW and its field duplicate sample exceed the Tier I EQS (freshwater) of 1 ug/L;
- Concentrations of sulphate ranging from 47 ug/L to 54 ug/L are above Upstream 95% UCL of 26 ug/L at SRC-1-SW (and its field duplicate sample), COB-4-SW and COB-6-SW. The sulphate concentration of 160 ug/L at COB-A-SW also exceeds the Upstream 95% UCL of 26 ug/L and the Pre-Construction/Baseline 95% UCL of 84 ug/L; and,



- Concentrations of strontium ranging from 140 ug/L to 260 ug/L are above the Upstream 95% UCL of 132 ug/L at SRC-1-SW (and its field duplicate sample), COB-A-SW, COB-4-SW and COB-6-SW. The concentration of 260 ug/L at COB-A-SW also exceeded the Pre-Construction/Baseline 95% UCL of 210 ug/L.

Table 5 provides a summary of concentrations for select inorganic parameters from the December 2014 sampling event relative to the calculated 95% UCLs.

Table 5 – Summary of Inorganic Surface Water Indicator Parameter Concentrations relative to Calculated 95% UCLs - December 2014											
Sample Location	SO4	Al	As	Cd	Cr	Co	Fe	Pb	Mn	Se	Sr
Units	(mg/L)	(ug/L)									
Upstream Calculated 95% UCL	26	220	1.6	0.1	8.3	-	3,318	1.2	583	1.9	132
Pre-Construction/Baseline Calculated 95% UCL	84	-	1.98	-	-	1.3	1,900	-	800	-	210
CB-SW	26	110	<1.0	0.018	<1.0	<0.40	290	<0.50	190	<1.0	130
NRC-1-SW	20	58	<1.0	0.022	<1.0	<0.40	150	<0.50	85	<1.0	32
SRC-1-SW	54	290	<1.0	0.035	<1.0	<0.40	340	1.2	190	<1.0	150
COB-A-SW	<u>160</u>	16	<1.0	<0.010	<1.0	<0.40	51	<0.50	25	<1.0	<u>260</u>
COB-4-SW	47	82	<1.0	0.014	<1.0	<0.40	210	<0.50	95	<1.0	140
COS-6-SW	56	61	<1.0	0.01	<1.0	<0.40	170	<0.50	56	<1.0	180
WB-1-SW	7.9	160	<1.0	0.038	<1.0	<0.40	270	0.7	95	<1.0	53
Battery Point/Narrows Calculated 95% UCL	2,180	-	-	-	-	0.9	190	-	70	-	7,000
NARROWS	170	110	<1.0	0.027	<1.0	<0.40	250	<0.50	63	<1.0	610
BP-1-SW	270	110	<1.0	0.028	<1.0	<0.40	240	<0.50	61	<1.0	950

Notes:
Bold indicates exceedance of the Upstream Calculated 95% UCL
Underline indicates exceedance of the Pre-Construction/Baseline Calculated 95% UCL
Italics indicates exceedance of the Battery Point/Narrows Calculated 95% UCL

QUALITY CONTROL PROCESS

One field duplicate of sample location SRC-1-SW and one trip blank were collected during the December 2014 monitoring event. The relative percent difference (RPD) was calculated between 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). Comparison of the field duplicate data to the original samples indicated the calculated RPDs were within established limits (i.e., less than 30% RPD). Volatile organic 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.

The Laboratory Quality Control reports have identified the following minor issue:

- Matrix spike PAH surrogate recovery (i.e., D14 Terephenyl) was 131%, which is outside of the laboratory QC limits of 30-130% for samples CB-SW, SRC-1-SW, NRC-1-SW, COB-4-SW, COB-6-SW and the Narrows.

SUMMARY

Analytical results of the December 2014 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 – December 2014	
Parameter	Location (Criteria and/or 95% UCL Exceedance)
Pyrene	<ul style="list-style-type: none"> • Narrows (Tier I EQS) • BP-1-SW (Tier I EQS)
Aluminum	<ul style="list-style-type: none"> • CB-SW (Tier I EQS and CCME FWAL) • NRC-1-SW (Tier I EQS) • SRC-1-SW and its field duplicate sample (Tier I EQS, CCME FWAL and Upstream 95% UCL) • COB-A-SW (Tier I EQS) • COB-4-SW (Tier I EQS) • COB-6-SW (Tier I EQS) • WB-1-SW (Tier I EQS and CCME FWAL)
Cadmium	<ul style="list-style-type: none"> • CB-SW (Tier I EQS) • NRC-1-SW (Tier I EQS) • SRC-1-SW and its field duplicate sample (Tier I EQS) • COB-4-SW (Tier I EQS) • WB-1-SW (Tier I EQS)
Copper	<ul style="list-style-type: none"> • SRC-1-SW and its field duplicate sample (Tier I EQS)
Iron	<ul style="list-style-type: none"> • SRC-1-SW and its field duplicate sample (Tier I EQS and CCME FWAL) • Narrows (Battery Point/Narrows 95% UCL) • BP-1-SW (Battery Point/Narrows 95% UCL)
Lead	<ul style="list-style-type: none"> • SRC-1-SW and its field duplicate sample (Tier I EQS)
Sulphate	<ul style="list-style-type: none"> • SRC-1-SW and its field duplicate sample (Upstream 95% UCL) • COB-A-SW (Upstream 95% UCL and Pre-Construction/Baseline 95% UCL) • COB-4-SW (Upstream 95% UCL) • COB-6-SW (Upstream 95% UCL)
Strontium	<ul style="list-style-type: none"> • SRC-1-SW and its field duplicate sample (Upstream 95% UCL) • COB-A-SW (Upstream 95% UCL and Pre-Construction/Baseline 95% UCL) • COB-4-SW (Upstream 95% UCL) • COB-6-SW (Upstream 95% UCL)



Elevated concentrations of aluminum are likely attributed to higher background values at CB-SW, NRC-1-SW, SRC-1-SW and WB-1-SW and are not related to the site use. Elevated metal concentrations (i.e., copper, iron and lead) at SRC-1-SW indicate potential impacts related to runoff from the up gradient municipal landfill. Elevated concentrations of sulfate, hardness and total dissolved solids were noted at sampling station COB-A-SW and may be indicative of potential influence from the up gradient municipal landfill.

RECOMMENDATIONS AND CONSIDERATIONS

It is recommended that one additional upstream sample be collected during the next surface water sampling event to further characterize the potential for impacts from the municipal landfill to COB-A-SW. The proposed location of this additional upstream sampling station is within the section of Coke Oven Brook along SPAR Road east of COB-A-SW and down gradient of the municipal landfill.

Water quality trend analysis will be conducted when sufficient post-remediation data is available (i.e., December 2015). The next surface water monitoring event will be conducted in Summer 2015 during low flow conditions.

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:kmf

Our File: 14-1360-4000

Attachments

APPENDIX A
TABLES

TABLE A-1
SURFACE WATER ANALYTICAL RESULTS - BTEX/TPH
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - DECEMBER 2014

Sample Location	Sample Date	BTEX Concentration				Petroleum Hydrocarbons				
		Benzene	Toluene	E. Benzene	Xylenes	C6 - C10	C10-C16	C16-C21	C21 - C32	Modified TPH
Units		mg/L								
NSE Tier 1 EQS Fresh Water ¹		2.1	0.77	0.32	0.33	-	-	-	-	1.5 (Gas) 0.1 (Fuel) 0.1 (Lube)
CCME FWAL ²		0.37	0.002	0.090	-	-	-	-	-	-
Calculated Upstream 95% UCL		-	-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		0.009	-	-	-	-	-	-	-	-
CB-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
NRC-1-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
SRC-1-SW	12/22/14 ^D	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
COB-A-SW	11/26/12	DRY - NO SAMPLE								
	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
COB-4-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
COB-6-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
WB-1-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
NSE Tier 1 EQS Fresh Water ¹		2.1	0.77	0.32	0.33	-	-	-	-	1.5 (Gas) 0.1 (Fuel) 0.1 (Lube)
BP-1-SW	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10
NARROWS	12/22/14	<0.0010	<0.0010	<0.0010	<0.0020	<0.010	<0.050	<0.050	<0.10	<0.10

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)

Underline Concentration exceeds Tier I EQS for surface water (marine)

Shading Concentration exceeds CCME FWAL

Shading Concentration exceeds CCME MAL

Double Underline Concentration exceeds Upstream Calculated 95% UCL

Dashed Border Concentration exceeds Battery Point/Narrows Calculated 95% UCL

Red Concentration exceeds Pre-Construction/Baseline Calculated 95% UCL

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

TABLE A-2
SURFACE WATER ANALYTICAL RESULTS - PAHs
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - DECEMBER 2014

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	Dibenz(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
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
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
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	0.010
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
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
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
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>
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>

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
- - - - -	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 A-3
SURFACE WATER ANALYTICAL RESULTS - PCBs
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - DECEMBER 2014**

Sample Location	Sample Date	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1242	Aroclor 1254	Aroclor 1260	Calculated Total PCB
Units		ug/L							
NSE Tier 1 EQS Fresh Water ¹		-	-	-	-	-	-	-	-
CCME FWAL ²		-	-	-	-	-	-	-	-
Upstream Calculated 95% UCL		-	-	-	-	-	-	-	-
Pre-Construction/Baseline Calculated 95% UCL		-	-	-	-	-	-	-	-
CB-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
NRC-1-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
SRC-1-SW	12/22/14 ^D	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
COB-A-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
COB-4-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
COB-6-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
WB-1-SW	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
NSE Tier 1 EQS Marine Water ¹		-	-	-	-	-	-	-	-
CCME MAL ²		-	-	-	-	-	-	-	-
Battery Point/Narrows Calculated 95% UCL		-	-	-	-	-	-	-	-
BP-1-SW	07/23/13	NM	NM	NM	NM	NM	NM	NM	<0.050
	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
NARROWS	12/22/14	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

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)

Underline Concentration exceeds Tier I EQS for surface water (marine)

Shading Concentration exceeds CCME FWAL

Shading Concentration exceeds CCME MAL

Double Underline Concentration exceeds Upstream Calculated 95% 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 A-4
 SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
 LTMM SURFACE WATER QUALITY MONITORING PROGRAM - DECEMBER 2014

Sample Location	Sample Date	Na	K	Ca	Mg	ALK	SO4	Cl	SiO2	OPO4	P	NO3	NO2	NO2-NO3	NH3	Colour	TOC	TURB	COND	pH	HARD	BICARB ALK	CARB ALK	TSS	TDS	Anion Sum	Ion Bal	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	mg/L	me/L	%	unitless	unitless	unitless	unitless
NSE Tier 1 EQS Fresh Water ¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCME FWAL ²		-	-	-	-	-	-	120	-	-	-	12	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	<2	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	NM	150	2.65	1.53	-0.418	-0.669	8.16	8.41
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	<2	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	NM	84	1.34	0.37	-1.75	-2.01	9.03	9.28
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	<2	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	NM	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	NM	260	4.43	1.84	-0.01	-0.259	7.81	8.06
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	<2	1510	22.8	3.51	1	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	NM	400	6.32	1.94	0.165	-0.084	7.52	7.76
COB-4-SW	12/22/14	20000	1600	34000	3600	53	<u>47</u>	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	NM	180	2.92	0.17	-0.431	-0.681	8.13	8.38
COB-6-SW	07/23/13	69200	5110	98900	9820	81	<u>170</u>	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	<2	520	8.18	4.1	0.78	0.532	7.58	7.83
	12/22/14	22000	1800	39000	3800	58	<u>56</u>	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	NM	200	3.33	0.76	-0.173	-0.423	8.04	8.29
WB-1-SW	07/23/13	5750000	210000	323000	667000	83	<u>1500</u>	<u>11000</u>	2	<0.010	<1000	0.051	<0.010	0.051	0.2	9.6	<5	6	31000	7.65	3600	82	<1.0	5	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	NM	65	1.1	2.33	-2.04	-2.29	9.23	9.48
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	11	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	NM	3500	60.8	1.58	0.248	0.007	8.17	8.41
NARROWS	12/22/14	600000	24000	58000	74000	57	170	1100	5.6	0.013	<100	0.22	0.016	0.24	0.11	16	2	1	3900	8.56	450	55	1.9	NM	2100	36	0.1	0.403	0.16	8.15	8.4

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 8 and a temperature of 10 C
- 4 - Guideline for chromium is based on CR6+
- 5 - Guideline value for aluminum based on a pH >6.5
- 6 - Guideline value for cadmium is based on hardness

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

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

**TABLE A-4
SURFACE WATER ANALYTICAL RESULTS - GENERAL CHEMISTRY AND TOTAL METALS
LTMM SURFACE WATER QUALITY MONITORING PROGRAM - DECEMBER 2014**

Sample Location	Sample Date	Al	Pb	As	Ba	Be	Bi	B	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Se	Ag	Si	Fl	Sn	Fl	U	V	Zn
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
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	Variable ⁶	1 ⁴	-	-	300	-	-	0.026	73	-	1	0.1	-	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	<u>196</u>	<0.10	<2.0	<2.0	0.37	<2.0	<5
	12/22/14	110	<1.0	<1.0	27	<1.0	<2.0	<50	0.018	<1.0	<0.40	<2.0	290	<0.50	190	<0.013	<2.0	<2.0	<1.0	<0.10	130	<0.10	<2.0	3.5	0.17	<2.0	6.0
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	150	<0.50	85	<0.013	<2.0	<2.0	<1.0	<0.10	32	<0.10	<2.0	<2.0	<0.10	<2.0	9.1
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	69	<0.50	41.4	NM	<2.0	<2.0	<1.0	<0.10	<u>174</u>	<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	<u>150</u>	<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	<u>150</u>	<0.10	<2.0	6.6	0.40	<2.0	6.9
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
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	<u>140</u>	<0.10	<2.0	3.2	0.18	<2.0	7.2
COB-6-SW	07/23/13	65.7	<1.0	1	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	<u>180</u>	<0.10	<2.0	<2.0	0.22	<2.0	6.0
WB-1-SW	07/23/13	<50	<10	<10	280	<10	<20	2470	0.6	<10	<4.0	<20	936	<5	1920	NM	<20	<20	<10	<1.0	4660	<1	<20	<20	1.6	<20	<50
	12/22/14	180	<1.0	<1.0	15	<1.0	<2.0	<50	0.038	<1.0	<0.40	<2.0	270	0.71	95	<0.013	<2.0	<2.0	<1.0	<0.10	53	<0.10	<2.0	4.6	<0.10	<2.0	10
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 ⁵	-	-	-	-	-	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	<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
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

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 8 and a temperature of 10 C

4 - Guideline for chromium is based on CR6+

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

6 - Guideline value for cadmium is based on hardness

Bold Concentration exceeds Tier I EQS for surface water (freshwater)

Underline Concentration exceeds Tier I EQS for surface water (marine)

Shading Concentration exceeds CCME FWAL

Shading Concentration exceeds CCME MAL

Double Underline Concentration exceeds Upstream Calculated 95% UCL

Dashed Border Concentration exceeds Battery Point/Narrows Calculated 95% Upper Concentration Limit

Red Concentration exceeds Pre-Construction/Baseline Calculated 95% Upper Concentration Limit

italics Laboratory detection limit is higher than guideline criteria

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

APPENDIX B
LABORATORY CERTIFICATES

Your P.O. #: 4104251070
Your C.O.C. #: 498021

Attention:Nadine Wambolt

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

Report Date: 2015/01/05
Report #: R3277645
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4O1676

Received: 2014/12/22, 16:35

Sample Matrix: Water
Samples Received: 11

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide (1)	10	N/A	2014/12/31	N/A	SM 22 4500-CO2 D
Alkalinity (1)	9	N/A	2014/12/30	ATL SOP 00013	EPA 310.2 R1974 m
Alkalinity (1)	1	N/A	2014/12/31	ATL SOP 00013	EPA 310.2 R1974 m
Chloride (1)	10	N/A	2015/01/02	ATL SOP 00014	SM 22 4500-Cl- E m
Colour (1)	10	N/A	2014/12/31	ATL SOP 00020	SM 22 2120C m
Conductance - water (1)	10	N/A	2014/12/31	ATL SOP 00004	SM 22 2510B m
TEH in Water (PIRI) (1)	11	2014/12/30	2014/12/30	ATL SOP 00113	Atl. PIRI v3 m
Hardness (calculated as CaCO3) (1)	9	N/A	2014/12/31	ATL SOP 00048	SM 22 2340 B
Hardness (calculated as CaCO3) (1)	1	N/A	2015/01/02	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL) (1)	10	2014/12/30	2014/12/30	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS (1, 2)	9	2014/12/30	2014/12/30	ATL SOP 00058	EPA 6020A R1 m
Metals Water Total MS (1, 2)	1	2014/12/30	2014/12/31	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference) (1)	10	N/A	2015/01/02		Auto Calc.
Anion and Cation Sum (1)	9	N/A	2014/12/31		Auto Calc.
Anion and Cation Sum (1)	1	N/A	2015/01/02		Auto Calc.
Nitrogen Ammonia - water (1)	10	N/A	2014/12/30	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite (1)	10	N/A	2015/01/02	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite (1)	10	N/A	2014/12/31	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N) (1)	10	N/A	2015/01/02	ATL SOP 00018	ASTM D3867
PAH in Water by GC/MS (SIM) (1)	4	2014/12/29	2015/01/03	ATL SOP 00103	EPA 8270D m
PAH in Water by GC/MS (SIM) (1)	6	2014/12/30	2015/01/04	ATL SOP 00103	EPA 8270D m
PCBs in water by GC/ECD (1)	10	2014/12/29	2014/12/31	ATL SOP 00107	EPA 8082 m
PCB Aroclor sum (water) (1)	10	N/A	2014/12/31		Auto Calc.
pH (1, 3)	10	N/A	2014/12/31	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho (1)	10	N/A	2015/01/02	ATL SOP 00021	EPA 365.2 m
VPH in Water (PIRI) (1)	5	N/A	2014/12/30	ATL SOP 00118	Atl. PIRI v3 m
VPH in Water (PIRI) (1)	6	N/A	2014/12/31	ATL SOP 00118	Atl. PIRI v3 m
Sat. pH and Langelier Index (@ 20C) (1)	10	N/A	2015/01/02	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C) (1)	10	N/A	2015/01/02	ATL SOP 00049	Auto Calc.
Reactive Silica (1)	10	N/A	2014/12/31	ATL SOP 00022	EPA 366.0 m

Your P.O. #: 4104251070
Your C.O.C. #: 498021

Attention:Nadine Wambolt

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

Report Date: 2015/01/05
Report #: R3277645
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B401676
Received: 2014/12/22, 16:35

Sample Matrix: Water
Samples Received: 11

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted		
Sulphate (1)	10	N/A	2015/01/02 ATL SOP 00023	EPA 375.4 R1978 m
Total Dissolved Solids (TDS calc) (1)	10	N/A	2015/01/02	Auto Calc.
Organic carbon - Total (TOC) (1, 4)	9	N/A	2014/12/31 ATL SOP 00037	SM 22 5310C m
Organic carbon - Total (TOC) (1, 4)	1	N/A	2015/01/02 ATL SOP 00037	SM 22 5310C m
ModTPH (T1) Calc. for Water (1)	11	N/A	2014/12/31 N/A	Atl. PIRI v3 m
Turbidity (1)	10	N/A	2015/01/02 ATL SOP 00011	EPA 180.1 R2 m

* 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) New RDLs in effect due to release of NS Contaminated Sites Regulations. Reduced RDL based on MDL study performance. Low level analytical run checks being implemented.
- (3) 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.
- (4) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Natalie MacAskill, Sr. Project Manager
Email: NMacAskill@maxxam.ca
Phone# (902)567-1255 Ext:17
=====

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

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

RBCA HYDROCARBONS IN WATER (WATER)

Maxxam ID		YY3999	YY4004	YY4005	YY4006		YY4007		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22		2014/12/22		
COC Number		498021	498021	498021	498021		498021		
	Units	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	QC Batch	NRC-1-SW	RDL	QC Batch
Petroleum Hydrocarbons									
Benzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	3873072	<0.0010	0.0010	3873072
Toluene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	3873072	<0.0010	0.0010	3873072
Ethylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	3873072	<0.0010	0.0010	3873072
Total Xylenes	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	3873072	<0.0020	0.0020	3873072
C6 - C10 (less BTEX)	mg/L	<0.010	<0.010	<0.010	<0.010	3873072	<0.010	0.010	3873072
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	3872936	<0.050	0.050	3872944
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	3872936	<0.050	0.050	3872944
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	<0.10	<0.10	3872936	<0.10	0.10	3872944
Modified TPH (Tier1)	mg/L	<0.10	<0.10	<0.10	<0.10	3867970	<0.10	0.10	3867970
Reached Baseline at C32	mg/L	NA	NA	NA	NA	3872936	NA	N/A	3872944
Hydrocarbon Resemblance	mg/L	NA	NA	NA	NA	3872936	NA	N/A	3872944
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	96	99	97	94	3872936	92		3872944
n-Dotriacontane - Extractable	%	86	91	90	89	3872936	86		3872944
Isobutylbenzene - Volatile	%	100	101	101	100	3873072	99		3873072
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
N/A = Not Applicable									

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

RBCA HYDROCARBONS IN WATER (WATER)

Maxxam ID		YY4008	YY4009	YY4010	YY4018	YY4019	YY4020		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021	498021	498021	498021		
	Units	NARROWS	COB-A-SW	WB-1-SW	BP-1-SW	FD-008	TB-009	RDL	QC Batch
Petroleum Hydrocarbons									
Benzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3873072
Toluene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3873072
Ethylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3873072
Total Xylenes	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	3873072
C6 - C10 (less BTEX)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873072
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872936
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872936
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3872936
Modified TPH (Tier1)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3867970
Reached Baseline at C32	mg/L	NA	NA	NA	NA	NA	NA	N/A	3872936
Hydrocarbon Resemblance	mg/L	NA	NA	NA	NA	NA	NA	N/A	3872936
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	92	93	98	98	97	99		3872936
n-Dotriacontane - Extractable	%	84	86	89	89	92	92		3872936
Isobutylbenzene - Volatile	%	100	100	100	99	99	99		3873072
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
N/A = Not Applicable									

Maxxam Job #: B4O1676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY3999	YY4004		YY4005		YY4006		YY4007		
Sampling Date		2014/12/22	2014/12/22		2014/12/22		2014/12/22		2014/12/22		
COC Number		498021	498021		498021		498021		498021		
	Units	COB-4-SW	COB-6-SW	RDL	CB-SW	RDL	SRC-1-SW	RDL	NRC-1-SW	RDL	QC Batch
Calculated Parameters											
Anion Sum	me/L	2.92	3.33	N/A	2.65	N/A	4.43	N/A	1.34	N/A	3867845
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	52	57	1.0	61	1.0	85	1.0	17	1.0	3867842
Calculated TDS	mg/L	180	200	1.0	150	1.0	260	1.0	84	1.0	3867850
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3867842
Cation Sum	me/L	2.91	3.28	N/A	2.57	N/A	4.27	N/A	1.33	N/A	3867845
Hardness (CaCO3)	mg/L	99	110	1.0	82	1.0	140	1.0	36	1.0	3867843
Ion Balance (% Difference)	%	0.170	0.760	N/A	1.53	N/A	1.84	N/A	0.370	N/A	3867844
Langelier Index (@ 20C)	N/A	-0.431	-0.173		-0.418		-0.0100		-1.75		3867848
Langelier Index (@ 4C)	N/A	-0.681	-0.423		-0.669		-0.259		-2.01		3867849
Nitrate (N)	mg/L	0.26	0.28	0.050	0.18	0.050	0.23	0.050	0.21	0.050	3867846
Saturation pH (@ 20C)	N/A	8.13	8.04		8.16		7.81		9.03		3867848
Saturation pH (@ 4C)	N/A	8.38	8.29		8.41		8.06		9.28		3867849
Inorganics											
Total Alkalinity (Total as CaCO3)	mg/L	53	58	5.0	62	5.0	86	5.0	17	5.0	3873127
Dissolved Chloride (Cl)	mg/L	31	35	1.0	30	1.0	56	1.0	20	1.0	3873129
Colour	TCU	12	11	5.0	29	5.0	16	5.0	10	5.0	3873134
Nitrate + Nitrite	mg/L	0.26	0.29	0.050	0.18	0.050	0.25	0.050	0.21	0.050	3873136
Nitrite (N)	mg/L	<0.010	0.011	0.010	<0.010	0.010	0.023	0.010	<0.010	0.010	3873137
Nitrogen (Ammonia Nitrogen)	mg/L	0.057	0.10	0.050	0.081	0.050	0.21	0.050	<0.050	0.050	3873118
Total Organic Carbon (C)	mg/L	3.0	2.6	0.50	4.4	0.50	4.8	0.50	2.2	0.50	3874414
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	0.046	0.010	<0.010	0.010	<0.010	0.010	3873135
pH	pH	7.70	7.86	N/A	7.74	N/A	7.80	N/A	7.28	N/A	3874159
Reactive Silica (SiO2)	mg/L	7.4	8.3	0.50	7.3	0.50	7.6	0.50	5.1	0.50	3873133
Dissolved Sulphate (SO4)	mg/L	47	56	10	26	2.0	54	10	20	2.0	3873131
Turbidity	NTU	1.5	0.87	0.10	1.1	0.10	5.4	0.10	0.51	0.10	3875516
Conductivity	uS/cm	300	340	1.0	270	1.0	440	1.0	140	1.0	3874162
Metals											
Total Aluminum (Al)	ug/L	82	61	5.0	110	5.0	290	5.0	58	5.0	3872926
Total Antimony (Sb)	ug/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Arsenic (As)	ug/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Barium (Ba)	ug/L	20	22	1.0	27	1.0	17	1.0	12	1.0	3872926
Total Beryllium (Be)	ug/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Boron (B)	ug/L	<50	<50	50	<50	50	110	50	<50	50	3872926
Total Cadmium (Cd)	ug/L	0.014	0.010	0.010	0.018	0.010	0.035	0.010	0.022	0.010	3872926
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable											

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY3999	YY4004		YY4005		YY4006		YY4007		
Sampling Date		2014/12/22	2014/12/22		2014/12/22		2014/12/22		2014/12/22		
COC Number		498021	498021		498021		498021		498021		
	Units	COB-4-SW	COB-6-SW	RDL	CB-SW	RDL	SRC-1-SW	RDL	NRC-1-SW	RDL	QC Batch
Total Calcium (Ca)	ug/L	34000	39000	100	27000	100	46000	100	12000	100	3872926
Total Chromium (Cr)	ug/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Cobalt (Co)	ug/L	<0.40	<0.40	0.40	<0.40	0.40	<0.40	0.40	<0.40	0.40	3872926
Total Copper (Cu)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	2.6	2.0	<2.0	2.0	3872926
Total Iron (Fe)	ug/L	210	170	50	290	50	340	50	150	50	3872926
Total Lead (Pb)	ug/L	<0.50	<0.50	0.50	<0.50	0.50	1.2	0.50	<0.50	0.50	3872926
Total Magnesium (Mg)	ug/L	3600	3800	100	3700	100	4800	100	1500	100	3872926
Total Manganese (Mn)	ug/L	95	56	2.0	190	2.0	190	2.0	85	2.0	3872926
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Nickel (Ni)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Phosphorus (P)	ug/L	<100	<100	100	110	100	<100	100	<100	100	3872926
Total Potassium (K)	ug/L	1600	1800	100	1400	100	2600	100	640	100	3872926
Total Selenium (Se)	ug/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Silver (Ag)	ug/L	<0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	3872926
Total Sodium (Na)	ug/L	20000	22000	100	20000	100	34000	100	13000	100	3872926
Total Strontium (Sr)	ug/L	140	180	2.0	130	2.0	150	2.0	32	2.0	3872926
Total Thallium (Tl)	ug/L	<0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	3872926
Total Tin (Sn)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Titanium (Ti)	ug/L	3.2	<2.0	2.0	3.5	2.0	6.6	2.0	<2.0	2.0	3872926
Total Uranium (U)	ug/L	0.18	0.22	0.10	0.17	0.10	0.40	0.10	<0.10	0.10	3872926
Total Vanadium (V)	ug/L	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Zinc (Zn)	ug/L	7.2	6.0	5.0	6.0	5.0	6.9	5.0	9.1	5.0	3872926
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY4008			YY4009		YY4010		YY4018		
Sampling Date		2014/12/22			2014/12/22		2014/12/22		2014/12/22		
COC Number		498021			498021		498021		498021		
	Units	NARROWS	RDL	QC Batch	COB-A-SW	RDL	WB-1-SW	RDL	BP-1-SW	RDL	QC Batch
Calculated Parameters											
Anion Sum	me/L	36.0	N/A	3867845	6.32	N/A	1.10	N/A	60.8	N/A	3867845
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	55	1.0	3867842	96	1.0	17	1.0	54	1.0	3867842
Calculated TDS	mg/L	2100	1.0	3867850	400	1.0	65	1.0	3500	1.0	3867850
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.9	1.0	3867842	<1.0	1.0	<1.0	1.0	1.3	1.0	3867842
Cation Sum	me/L	35.9	N/A	3867845	6.57	N/A	1.05	N/A	58.9	N/A	3867845
Hardness (CaCO3)	mg/L	450	1.0	3867843	270	1.0	25	1.0	680	1.0	3867843
Ion Balance (% Difference)	%	0.100	N/A	3867844	1.94	N/A	2.33	N/A	1.58	N/A	3867844
Langelier Index (@ 20C)	N/A	0.403		3867848	0.165		-2.04		0.248		3867848
Langelier Index (@ 4C)	N/A	0.160		3867849	-0.0840		-2.29		0.00700		3867849
Nitrate (N)	mg/L	0.22	0.050	3867846	0.40	0.050	0.14	0.050	0.19	0.050	3867846
Saturation pH (@ 20C)	N/A	8.15		3867848	7.52		9.23		8.17		3867848
Saturation pH (@ 4C)	N/A	8.40		3867849	7.76		9.48		8.41		3867849
Inorganics											
Total Alkalinity (Total as CaCO3)	mg/L	57	5.0	3873127	97	10	17	5.0	56	5.0	3873127
Dissolved Chloride (Cl)	mg/L	1100	10	3873129	37	1.0	21	1.0	1900	15	3873129
Colour	TCU	16	5.0	3873134	5.4	5.0	32	5.0	18	5.0	3873134
Nitrate + Nitrite	mg/L	0.24	0.050	3873136	0.40	0.050	0.14	0.050	0.21	0.050	3873136
Nitrite (N)	mg/L	0.016	0.010	3873137	<0.010	0.010	<0.010	0.010	0.019	0.010	3873137
Nitrogen (Ammonia Nitrogen)	mg/L	0.11	0.050	3873118	<0.050	0.050	0.12	0.050	0.11	0.050	3873118
Total Organic Carbon (C)	mg/L	2.0	0.50	3874414	2.0	0.50	3.7	0.50	2.3	0.50	3874414
Orthophosphate (P)	mg/L	0.013	0.010	3873135	<0.010	0.010	0.011	0.010	0.012	0.010	3873135
pH	pH	8.56	N/A	3874159	7.68	N/A	7.19	N/A	8.42	N/A	3874164
Reactive Silica (SiO2)	mg/L	5.6	0.50	3873133	13	0.50	3.4	0.50	5.5	0.50	3873133
Dissolved Sulphate (SO4)	mg/L	170	10	3873131	160	10	7.9	2.0	270	40	3873131
Turbidity	NTU	1.0	0.10	3875516	0.41	0.10	0.83	0.10	1.1	0.10	3875516
Conductivity	uS/cm	3900	1.0	3874162	640	1.0	120	1.0	6300	1.0	3874165
Metals											
Total Aluminum (Al)	ug/L	110	5.0	3872926	16	5.0	180	5.0	110	5.0	3872926
Total Antimony (Sb)	ug/L	<1.0	1.0	3872926	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Arsenic (As)	ug/L	<1.0	1.0	3872926	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Barium (Ba)	ug/L	19	1.0	3872926	14	1.0	15	1.0	19	1.0	3872926
Total Beryllium (Be)	ug/L	<1.0	1.0	3872926	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Bismuth (Bi)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Boron (B)	ug/L	300	50	3872926	<50	50	<50	50	480	50	3872926
Total Cadmium (Cd)	ug/L	0.027	0.010	3872926	<0.010	0.010	0.038	0.010	0.028	0.010	3872926
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable											

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY4008			YY4009		YY4010		YY4018		
Sampling Date		2014/12/22			2014/12/22		2014/12/22		2014/12/22		
COC Number		498021			498021		498021		498021		
	Units	NARROWS	RDL	QC Batch	COB-A-SW	RDL	WB-1-SW	RDL	BP-1-SW	RDL	QC Batch
Total Calcium (Ca)	ug/L	58000	100	3872926	88000	100	7500	100	68000	100	3872926
Total Chromium (Cr)	ug/L	<1.0	1.0	3872926	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Cobalt (Co)	ug/L	<0.40	0.40	3872926	<0.40	0.40	<0.40	0.40	<0.40	0.40	3872926
Total Copper (Cu)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Iron (Fe)	ug/L	250	50	3872926	51	50	270	50	240	50	3872926
Total Lead (Pb)	ug/L	<0.50	0.50	3872926	<0.50	0.50	0.71	0.50	<0.50	0.50	3872926
Total Magnesium (Mg)	ug/L	74000	100	3872926	13000	100	1400	100	120000	1000	3872926
Total Manganese (Mn)	ug/L	63	2.0	3872926	25	2.0	95	2.0	61	2.0	3872926
Total Molybdenum (Mo)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Nickel (Ni)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Phosphorus (P)	ug/L	<100	100	3872926	<100	100	<100	100	<100	100	3872926
Total Potassium (K)	ug/L	24000	100	3872926	3300	100	700	100	38000	100	3872926
Total Selenium (Se)	ug/L	<1.0	1.0	3872926	<1.0	1.0	<1.0	1.0	<1.0	1.0	3872926
Total Silver (Ag)	ug/L	<0.10	0.10	3872926	<0.10	0.10	<0.10	0.10	<0.10	0.10	3872926
Total Sodium (Na)	ug/L	600000	100	3872926	23000	100	12000	100	1000000	100	3872926
Total Strontium (Sr)	ug/L	610	2.0	3872926	260	2.0	53	2.0	950	2.0	3872926
Total Thallium (Tl)	ug/L	<0.10	0.10	3872926	<0.10	0.10	<0.10	0.10	<0.10	0.10	3872926
Total Tin (Sn)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Titanium (Ti)	ug/L	2.4	2.0	3872926	<2.0	2.0	4.6	2.0	<2.0	2.0	3872926
Total Uranium (U)	ug/L	0.32	0.10	3872926	0.38	0.10	<0.10	0.10	0.41	0.10	3872926
Total Vanadium (V)	ug/L	<2.0	2.0	3872926	<2.0	2.0	<2.0	2.0	<2.0	2.0	3872926
Total Zinc (Zn)	ug/L	7.3	5.0	3872926	<5.0	5.0	10	5.0	7.2	5.0	3872926
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY4019		
Sampling Date		2014/12/22		
COC Number		498021		
	Units	FD-008	RDL	QC Batch
Calculated Parameters				
Anion Sum	me/L	4.44	N/A	3867845
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	86	1.0	3867842
Calculated TDS	mg/L	260	1.0	3867850
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	3867842
Cation Sum	me/L	4.23	N/A	3867845
Hardness (CaCO3)	mg/L	130	1.0	3867843
Ion Balance (% Difference)	%	2.42	N/A	3867844
Langelier Index (@ 20C)	N/A	0.108		3867848
Langelier Index (@ 4C)	N/A	-0.141		3867849
Nitrate (N)	mg/L	0.24	0.050	3867846
Saturation pH (@ 20C)	N/A	7.81		3867848
Saturation pH (@ 4C)	N/A	8.06		3867849
Inorganics				
Total Alkalinity (Total as CaCO3)	mg/L	87	5.0	3873127
Dissolved Chloride (Cl)	mg/L	56	1.0	3873129
Colour	TCU	16	5.0	3873134
Nitrate + Nitrite	mg/L	0.26	0.050	3873136
Nitrite (N)	mg/L	0.025	0.010	3873137
Nitrogen (Ammonia Nitrogen)	mg/L	0.20	0.050	3873118
Total Organic Carbon (C)	mg/L	4.6	0.50	3875337
Orthophosphate (P)	mg/L	<0.010	0.010	3873135
pH	pH	7.92	N/A	3874164
Reactive Silica (SiO2)	mg/L	8.3	0.50	3873133
Dissolved Sulphate (SO4)	mg/L	53	10	3873131
Turbidity	NTU	5.0	0.10	3875516
Conductivity	uS/cm	450	1.0	3874165
Metals				
Total Aluminum (Al)	ug/L	350	5.0	3872926
Total Antimony (Sb)	ug/L	<1.0	1.0	3872926
Total Arsenic (As)	ug/L	<1.0	1.0	3872926
Total Barium (Ba)	ug/L	17	1.0	3872926
Total Beryllium (Be)	ug/L	<1.0	1.0	3872926
Total Bismuth (Bi)	ug/L	<2.0	2.0	3872926
Total Boron (B)	ug/L	110	50	3872926
Total Cadmium (Cd)	ug/L	0.042	0.010	3872926
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

Maxxam Job #: B4O1676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		YY4019		
Sampling Date		2014/12/22		
COC Number		498021		
	Units	FD-008	RDL	QC Batch
Total Calcium (Ca)	ug/L	46000	100	3872926
Total Chromium (Cr)	ug/L	<1.0	1.0	3872926
Total Cobalt (Co)	ug/L	<0.40	0.40	3872926
Total Copper (Cu)	ug/L	2.8	2.0	3872926
Total Iron (Fe)	ug/L	350	50	3872926
Total Lead (Pb)	ug/L	1.2	0.50	3872926
Total Magnesium (Mg)	ug/L	4800	100	3872926
Total Manganese (Mn)	ug/L	200	2.0	3872926
Total Molybdenum (Mo)	ug/L	<2.0	2.0	3872926
Total Nickel (Ni)	ug/L	<2.0	2.0	3872926
Total Phosphorus (P)	ug/L	<100	100	3872926
Total Potassium (K)	ug/L	2700	100	3872926
Total Selenium (Se)	ug/L	<1.0	1.0	3872926
Total Silver (Ag)	ug/L	<0.10	0.10	3872926
Total Sodium (Na)	ug/L	34000	100	3872926
Total Strontium (Sr)	ug/L	150	2.0	3872926
Total Thallium (Tl)	ug/L	<0.10	0.10	3872926
Total Tin (Sn)	ug/L	<2.0	2.0	3872926
Total Titanium (Ti)	ug/L	6.8	2.0	3872926
Total Uranium (U)	ug/L	0.40	0.10	3872926
Total Vanadium (V)	ug/L	<2.0	2.0	3872926
Total Zinc (Zn)	ug/L	7.0	5.0	3872926
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		YY3999	YY4004	YY4005	YY4006	YY4007	YY4008	YY4009		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021	498021	498021	498021	498021		
	Units	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	NRC-1-SW	NARROWS	COB-A-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	3873233
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										

Maxxam ID		YY4010	YY4018	YY4019		
Sampling Date		2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021		
	Units	WB-1-SW	BP-1-SW	FD-008	RDL	QC Batch
Metals						
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	0.013	3873233
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		YY3999	YY4004	YY4005	YY4006	YY4007	YY4008		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021	498021	498021	498021		
	Units	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	NRC-1-SW	NARROWS	RDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.13	0.050	3873762
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3873762
Acenaphthene	ug/L	0.013	0.089	0.049	<0.010	<0.010	0.10	0.010	3873762
Acenaphthylene	ug/L	<0.010	0.016	<0.010	<0.010	<0.010	0.11	0.010	3873762
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.010	3873762
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Fluoranthene	ug/L	<0.010	0.020	0.015	<0.010	<0.010	0.033	0.010	3873762
Fluorene	ug/L	<0.010	0.026	0.028	<0.010	<0.010	0.089	0.010	3873762
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	0.20	3873762
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3873762
Phenanthrene	ug/L	<0.010	<0.010	0.017	<0.010	<0.010	0.065	0.010	3873762
Pyrene	ug/L	<0.010	0.013	0.012	<0.010	<0.010	0.030	0.010	3873762
Surrogate Recovery (%)									
D10-Anthracene	%	80	53	69	67	80	66		3873762
D14-Terphenyl	%	82	80	73	73	81	66		3873762
D8-Acenaphthylene	%	77	54	70	73	78	64		3873762
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

Maxxam Job #: B4O1676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		YY4009	YY4010	YY4018	YY4019		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021	498021		
	Units	COB-A-SW	WB-1-SW	BP-1-SW	FD-008	RDL	QC Batch
Polyaromatic Hydrocarbons							
1-Methylnaphthalene	ug/L	<0.050	<0.050	0.094	<0.050	0.050	3874275
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	3874275
Acenaphthene	ug/L	<0.010	<0.010	0.069	<0.010	0.010	3874275
Acenaphthylene	ug/L	<0.010	<0.010	0.10	<0.010	0.010	3874275
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	0.013	0.010	3874275
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	0.013	0.010	3874275
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	0.010	0.010	3874275
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Chrysene	ug/L	<0.010	<0.010	<0.010	0.011	0.010	3874275
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Fluoranthene	ug/L	0.011	0.014	0.041	0.021	0.010	3874275
Fluorene	ug/L	<0.010	<0.010	0.083	<0.010	0.010	3874275
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	3874275
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	3874275
Phenanthrene	ug/L	<0.010	0.011	0.065	0.012	0.010	3874275
Pyrene	ug/L	0.010	<0.010	0.036	0.018	0.010	3874275
Surrogate Recovery (%)							
D10-Anthracene	%	90	60	60	66		3874275
D14-Terphenyl	%	96	63 (1)	65 (1)	74 (1)		3874275
D8-Acenaphthylene	%	94	62	63	75		3874275
RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) PAH sample contained sediment.							

Maxxam Job #: B401676
Report Date: 2015/01/05

Dillon Consulting Limited
Your P.O. #: 4104251070

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		YY3999	YY4004	YY4005	YY4006	YY4007	YY4008	YY4009		
Sampling Date		2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021	498021	498021	498021	498021		
	Units	COB-4-SW	COB-6-SW	CB-SW	SRC-1-SW	NRC-1-SW	NARROWS	COB-A-SW	RDL	QC Batch
PCBs										
Aroclor 1016	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1221	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1232	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1248	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1242	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1254	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1260	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3872337
Calculated Total PCB	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3869363
Surrogate Recovery (%)										
Decachlorobiphenyl	%	67	68	60	60	67	69	82		3872337
RDL = Reportable Detection Limit QC Batch = Quality Control Batch										

Maxxam ID		YY4010	YY4018	YY4019		
Sampling Date		2014/12/22	2014/12/22	2014/12/22		
COC Number		498021	498021	498021		
	Units	WB-1-SW	BP-1-SW	FD-008	RDL	QC Batch
PCBs						
Aroclor 1016	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1221	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1232	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1248	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1242	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1254	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Aroclor 1260	ug/L	<0.050	<0.050	<0.050	0.050	3872337
Calculated Total PCB	ug/L	<0.050	<0.050	<0.050	0.050	3869363
Surrogate Recovery (%)						
Decachlorobiphenyl	%	54	67	54		3872337
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						

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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits			
3872337	LGE	Matrix Spike [YY4004-07]	Decachlorobiphenyl	2014/12/31		69	%	30 - 130			
			Aroclor 1254	2014/12/31		110	%	30 - 130			
3872337	LGE	Spiked Blank	Decachlorobiphenyl	2014/12/31		44	%	30 - 130			
			Aroclor 1254	2014/12/31		107	%	30 - 130			
3872337	LGE	Method Blank	Decachlorobiphenyl	2014/12/31		60	%	30 - 130			
			Aroclor 1016	2014/12/31	<0.050		ug/L				
			Aroclor 1221	2014/12/31	<0.050		ug/L				
			Aroclor 1232	2014/12/31	<0.050		ug/L				
			Aroclor 1248	2014/12/31	<0.050		ug/L				
			Aroclor 1242	2014/12/31	<0.050		ug/L				
			Aroclor 1254	2014/12/31	<0.050		ug/L				
			Aroclor 1260	2014/12/31	<0.050		ug/L				
3872337	LGE	RPD [YY3999-07]	Aroclor 1016	2014/12/31	NC		%	40			
			Aroclor 1221	2014/12/31	NC		%	40			
			Aroclor 1232	2014/12/31	NC		%	40			
			Aroclor 1248	2014/12/31	NC		%	40			
			Aroclor 1242	2014/12/31	NC		%	40			
			Aroclor 1254	2014/12/31	NC		%	40			
			Aroclor 1260	2014/12/31	NC		%	40			
3872926	MLB	Matrix Spike [YY4004-02]	Total Aluminum (Al)	2014/12/30		102	%	80 - 120			
			Total Antimony (Sb)	2014/12/30		104	%	80 - 120			
			Total Arsenic (As)	2014/12/30		101	%	80 - 120			
			Total Barium (Ba)	2014/12/30		98	%	80 - 120			
			Total Beryllium (Be)	2014/12/30		101	%	80 - 120			
			Total Bismuth (Bi)	2014/12/30		104	%	80 - 120			
			Total Boron (B)	2014/12/30		101	%	80 - 120			
			Total Cadmium (Cd)	2014/12/30		102	%	80 - 120			
			Total Calcium (Ca)	2014/12/30		NC	%	80 - 120			
			Total Chromium (Cr)	2014/12/30		98	%	80 - 120			
			Total Cobalt (Co)	2014/12/30		99	%	80 - 120			
			Total Copper (Cu)	2014/12/30		98	%	80 - 120			
			Total Iron (Fe)	2014/12/30		105	%	80 - 120			
			Total Lead (Pb)	2014/12/30		99	%	80 - 120			
			Total Magnesium (Mg)	2014/12/30		105	%	80 - 120			
			Total Manganese (Mn)	2014/12/30		NC	%	80 - 120			
			Total Molybdenum (Mo)	2014/12/30		104	%	80 - 120			
			Total Nickel (Ni)	2014/12/30		104	%	80 - 120			
			Total Phosphorus (P)	2014/12/30		107	%	80 - 120			
			Total Potassium (K)	2014/12/30		104	%	80 - 120			
			Total Selenium (Se)	2014/12/30		100	%	80 - 120			
			Total Silver (Ag)	2014/12/30		100	%	80 - 120			
			Total Sodium (Na)	2014/12/30		NC	%	80 - 120			
			Total Strontium (Sr)	2014/12/30		NC	%	80 - 120			
			Total Thallium (Tl)	2014/12/30		103	%	80 - 120			
			Total Tin (Sn)	2014/12/30		106	%	80 - 120			
			Total Titanium (Ti)	2014/12/30		103	%	80 - 120			
			Total Uranium (U)	2014/12/30		109	%	80 - 120			
			Total Vanadium (V)	2014/12/30		100	%	80 - 120			
			Total Zinc (Zn)	2014/12/30		100	%	80 - 120			
			3872926	MLB	Spiked Blank	Total Aluminum (Al)	2014/12/30		105	%	80 - 120
						Total Antimony (Sb)	2014/12/30		104	%	80 - 120
Total Arsenic (As)	2014/12/30					102	%	80 - 120			
Total Barium (Ba)	2014/12/30					100	%	80 - 120			
Total Beryllium (Be)	2014/12/30					103	%	80 - 120			

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Total Bismuth (Bi)	2014/12/30		108	%	80 - 120
			Total Boron (B)	2014/12/30		101	%	80 - 120
			Total Cadmium (Cd)	2014/12/30		102	%	80 - 120
			Total Calcium (Ca)	2014/12/30		106	%	80 - 120
			Total Chromium (Cr)	2014/12/30		98	%	80 - 120
			Total Cobalt (Co)	2014/12/30		101	%	80 - 120
			Total Copper (Cu)	2014/12/30		100	%	80 - 120
			Total Iron (Fe)	2014/12/30		108	%	80 - 120
			Total Lead (Pb)	2014/12/30		101	%	80 - 120
			Total Magnesium (Mg)	2014/12/30		108	%	80 - 120
			Total Manganese (Mn)	2014/12/30		105	%	80 - 120
			Total Molybdenum (Mo)	2014/12/30		104	%	80 - 120
			Total Nickel (Ni)	2014/12/30		104	%	80 - 120
			Total Phosphorus (P)	2014/12/30		108	%	80 - 120
			Total Potassium (K)	2014/12/30		104	%	80 - 120
			Total Selenium (Se)	2014/12/30		100	%	80 - 120
			Total Silver (Ag)	2014/12/30		101	%	80 - 120
			Total Sodium (Na)	2014/12/30		103	%	80 - 120
			Total Strontium (Sr)	2014/12/30		104	%	80 - 120
			Total Thallium (Tl)	2014/12/30		105	%	80 - 120
			Total Tin (Sn)	2014/12/30		104	%	80 - 120
			Total Titanium (Ti)	2014/12/30		104	%	80 - 120
			Total Uranium (U)	2014/12/30		109	%	80 - 120
			Total Vanadium (V)	2014/12/30		100	%	80 - 120
			Total Zinc (Zn)	2014/12/30		103	%	80 - 120
3872926	MLB	Method Blank	Total Aluminum (Al)	2014/12/30	<5.0		ug/L	
			Total Antimony (Sb)	2014/12/30	<1.0		ug/L	
			Total Arsenic (As)	2014/12/30	<1.0		ug/L	
			Total Barium (Ba)	2014/12/30	<1.0		ug/L	
			Total Beryllium (Be)	2014/12/30	<1.0		ug/L	
			Total Bismuth (Bi)	2014/12/30	<2.0		ug/L	
			Total Boron (B)	2014/12/30	<50		ug/L	
			Total Cadmium (Cd)	2014/12/30	<0.010		ug/L	
			Total Calcium (Ca)	2014/12/30	<100		ug/L	
			Total Chromium (Cr)	2014/12/30	<1.0		ug/L	
			Total Cobalt (Co)	2014/12/30	<0.40		ug/L	
			Total Copper (Cu)	2014/12/30	<2.0		ug/L	
			Total Iron (Fe)	2014/12/30	<50		ug/L	
			Total Lead (Pb)	2014/12/30	<0.50		ug/L	
			Total Magnesium (Mg)	2014/12/30	<100		ug/L	
			Total Manganese (Mn)	2014/12/30	<2.0		ug/L	
			Total Molybdenum (Mo)	2014/12/30	<2.0		ug/L	
			Total Nickel (Ni)	2014/12/30	<2.0		ug/L	
			Total Phosphorus (P)	2014/12/30	<100		ug/L	
			Total Potassium (K)	2014/12/30	<100		ug/L	
			Total Selenium (Se)	2014/12/30	<1.0		ug/L	
			Total Silver (Ag)	2014/12/30	<0.10		ug/L	
			Total Sodium (Na)	2014/12/30	<100		ug/L	
			Total Strontium (Sr)	2014/12/30	<2.0		ug/L	
			Total Thallium (Tl)	2014/12/30	<0.10		ug/L	
			Total Tin (Sn)	2014/12/30	<2.0		ug/L	
			Total Titanium (Ti)	2014/12/30	<2.0		ug/L	
			Total Uranium (U)	2014/12/30	<0.10		ug/L	
			Total Vanadium (V)	2014/12/30	<2.0		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3872926	MLB	RPD [YY3999-02]	Total Zinc (Zn)	2014/12/30	<5.0		ug/L	
			Total Aluminum (Al)	2014/12/30	3.3		%	20
			Total Antimony (Sb)	2014/12/30	NC		%	20
			Total Arsenic (As)	2014/12/30	NC		%	20
			Total Barium (Ba)	2014/12/30	1.3		%	20
			Total Beryllium (Be)	2014/12/30	NC		%	20
			Total Bismuth (Bi)	2014/12/30	NC		%	20
			Total Boron (B)	2014/12/30	NC		%	20
			Total Cadmium (Cd)	2014/12/30	NC		%	20
			Total Calcium (Ca)	2014/12/30	2.4		%	20
			Total Chromium (Cr)	2014/12/30	NC		%	20
			Total Cobalt (Co)	2014/12/30	NC		%	20
			Total Copper (Cu)	2014/12/30	NC		%	20
			Total Iron (Fe)	2014/12/30	NC		%	20
			Total Lead (Pb)	2014/12/30	NC		%	20
			Total Magnesium (Mg)	2014/12/30	1.3		%	20
			Total Manganese (Mn)	2014/12/30	0.55		%	20
			Total Molybdenum (Mo)	2014/12/30	NC		%	20
			Total Nickel (Ni)	2014/12/30	NC		%	20
			Total Phosphorus (P)	2014/12/30	NC		%	20
			Total Potassium (K)	2014/12/30	0.86		%	20
			Total Selenium (Se)	2014/12/30	NC		%	20
			Total Silver (Ag)	2014/12/30	NC		%	20
			Total Sodium (Na)	2014/12/30	1.6		%	20
			Total Strontium (Sr)	2014/12/30	1.8		%	20
			Total Thallium (Tl)	2014/12/30	NC		%	20
			Total Tin (Sn)	2014/12/30	NC		%	20
			Total Titanium (Ti)	2014/12/30	NC		%	20
Total Uranium (U)	2014/12/30	NC		%	20			
Total Vanadium (V)	2014/12/30	NC		%	20			
Total Zinc (Zn)	2014/12/30	NC		%	20			
3872936	BHR	Matrix Spike	Isobutylbenzene - Extractable	2014/12/30		98	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		97	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30		74	%	30 - 130
			>C16-C21 Hydrocarbons	2014/12/30		85	%	30 - 130
			>C21-<C32 Hydrocarbons	2014/12/30		85	%	30 - 130
3872936	BHR	Spiked Blank	Isobutylbenzene - Extractable	2014/12/30		90	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		100	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30		76	%	30 - 130
			>C16-C21 Hydrocarbons	2014/12/30		84	%	30 - 130
			>C21-<C32 Hydrocarbons	2014/12/30		86	%	30 - 130
3872936	BHR	Method Blank	Isobutylbenzene - Extractable	2014/12/30		92	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		89	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30	<0.050		mg/L	
			>C16-C21 Hydrocarbons	2014/12/30	<0.050		mg/L	
			>C21-<C32 Hydrocarbons	2014/12/30	<0.10		mg/L	
3872936	BHR	RPD [YY4009-08]	>C10-C16 Hydrocarbons	2014/12/30	NC		%	40
			>C16-C21 Hydrocarbons	2014/12/30	NC		%	40
			>C21-<C32 Hydrocarbons	2014/12/30	NC		%	40
3872944	BHR	Matrix Spike [YY4007-08]	Isobutylbenzene - Extractable	2014/12/30		99	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		93	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30		75	%	30 - 130
			>C16-C21 Hydrocarbons	2014/12/30		82	%	30 - 130
			>C21-<C32 Hydrocarbons	2014/12/30		80	%	30 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3872944	BHR	Spiked Blank	Isobutylbenzene - Extractable	2014/12/30		88	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		102	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30		87	%	30 - 130
			>C16-C21 Hydrocarbons	2014/12/30		98	%	30 - 130
			>C21-<C32 Hydrocarbons	2014/12/30		97	%	30 - 130
3872944	BHR	Method Blank	Isobutylbenzene - Extractable	2014/12/30		94	%	30 - 130
			n-Dotriacontane - Extractable	2014/12/30		89	%	30 - 130
			>C10-C16 Hydrocarbons	2014/12/30	<0.050		mg/L	
			>C16-C21 Hydrocarbons	2014/12/30	<0.050		mg/L	
			>C21-<C32 Hydrocarbons	2014/12/30	<0.10		mg/L	
3872944	BHR	RPD	>C10-C16 Hydrocarbons	2014/12/30	NC		%	40
			>C16-C21 Hydrocarbons	2014/12/30	NC		%	40
			>C21-<C32 Hydrocarbons	2014/12/30	NC		%	40
3873072	SHL	Matrix Spike [YY4004-09]	Isobutylbenzene - Volatile	2014/12/30		101	%	70 - 130
			Benzene	2014/12/30		100	%	70 - 130
			Toluene	2014/12/30		102	%	70 - 130
			Ethylbenzene	2014/12/30		101	%	70 - 130
			Total Xylenes	2014/12/30		104	%	70 - 130
3873072	SHL	Spiked Blank	Isobutylbenzene - Volatile	2014/12/30		101	%	70 - 130
			Benzene	2014/12/30		105	%	70 - 130
			Toluene	2014/12/30		108	%	70 - 130
			Ethylbenzene	2014/12/30		110	%	70 - 130
			Total Xylenes	2014/12/30		109	%	70 - 130
3873072	SHL	Method Blank	Isobutylbenzene - Volatile	2014/12/30		93	%	70 - 130
			Benzene	2014/12/30	<0.0010		mg/L	
			Toluene	2014/12/30	<0.0010		mg/L	
			Ethylbenzene	2014/12/30	<0.0010		mg/L	
			Total Xylenes	2014/12/30	<0.0020		mg/L	
			C6 - C10 (less BTEX)	2014/12/30	<0.010		mg/L	
3873072	SHL	RPD [YY3999-09]	Benzene	2014/12/30	NC		%	40
			Toluene	2014/12/30	NC		%	40
			Ethylbenzene	2014/12/30	NC		%	40
			Total Xylenes	2014/12/30	NC		%	40
			C6 - C10 (less BTEX)	2014/12/30	NC		%	40
3873118	ARS	Matrix Spike [YY4006-03]	Nitrogen (Ammonia Nitrogen)	2014/12/30		96	%	80 - 120
3873118	ARS	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2014/12/30		100	%	80 - 120
3873118	ARS	Method Blank	Nitrogen (Ammonia Nitrogen)	2014/12/30	<0.050		mg/L	
3873118	ARS	RPD [YY4006-03]	Nitrogen (Ammonia Nitrogen)	2014/12/30	NC		%	25
3873127	ARS	Matrix Spike	Total Alkalinity (Total as CaCO3)	2014/12/30		NC	%	80 - 120
3873127	ARS	Spiked Blank	Total Alkalinity (Total as CaCO3)	2014/12/30		105	%	80 - 120
3873127	ARS	Method Blank	Total Alkalinity (Total as CaCO3)	2014/12/30	<5.0		mg/L	
3873127	ARS	RPD	Total Alkalinity (Total as CaCO3)	2014/12/30	0.54		%	25
3873129	ARS	Matrix Spike	Dissolved Chloride (Cl)	2015/01/02		NC	%	80 - 120
3873129	ARS	QC Standard	Dissolved Chloride (Cl)	2015/01/02		101	%	80 - 120
3873129	ARS	Spiked Blank	Dissolved Chloride (Cl)	2015/01/02		98	%	80 - 120
3873129	ARS	Method Blank	Dissolved Chloride (Cl)	2015/01/02	<1.0		mg/L	
3873129	ARS	RPD	Dissolved Chloride (Cl)	2015/01/02	6.9		%	25
3873131	ARS	Matrix Spike	Dissolved Sulphate (SO4)	2015/01/02		NC	%	80 - 120
3873131	ARS	Spiked Blank	Dissolved Sulphate (SO4)	2015/01/02		100	%	80 - 120
3873131	ARS	Method Blank	Dissolved Sulphate (SO4)	2015/01/02	<2.0		mg/L	
3873131	ARS	RPD	Dissolved Sulphate (SO4)	2015/01/02	0.36		%	25
3873133	ARS	Matrix Spike	Reactive Silica (SiO2)	2014/12/31		107	%	80 - 120
3873133	ARS	Spiked Blank	Reactive Silica (SiO2)	2014/12/31		100	%	80 - 120
3873133	ARS	Method Blank	Reactive Silica (SiO2)	2014/12/31	<0.50		mg/L	

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QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3873133	ARS	RPD	Reactive Silica (SiO2)	2014/12/31	NC		%	25
3873134	MCY	Spiked Blank	Colour	2014/12/31		101	%	80 - 120
3873134	MCY	Method Blank	Colour	2014/12/31	<5.0		TCU	
3873134	MCY	RPD	Colour	2014/12/31	NC		%	25
3873135	MCY	Matrix Spike	Orthophosphate (P)	2015/01/02		99	%	80 - 120
3873135	MCY	Spiked Blank	Orthophosphate (P)	2015/01/02		103	%	80 - 120
3873135	MCY	Method Blank	Orthophosphate (P)	2015/01/02	<0.010		mg/L	
3873135	MCY	RPD	Orthophosphate (P)	2015/01/02	NC		%	25
3873136	NRG	Matrix Spike	Nitrate + Nitrite	2015/01/02		NC	%	80 - 120
3873136	NRG	Spiked Blank	Nitrate + Nitrite	2015/01/02		102	%	80 - 120
3873136	NRG	Method Blank	Nitrate + Nitrite	2015/01/02	<0.050		mg/L	
3873136	NRG	RPD	Nitrate + Nitrite	2015/01/02	1.6		%	25
3873137	MCY	Matrix Spike	Nitrite (N)	2014/12/31		100	%	80 - 120
3873137	MCY	Spiked Blank	Nitrite (N)	2014/12/31		99	%	80 - 120
3873137	MCY	Method Blank	Nitrite (N)	2014/12/31	<0.010		mg/L	
3873137	MCY	RPD	Nitrite (N)	2014/12/31	3.6		%	25
3873233	ALG	Matrix Spike [YY4004-05]	Total Mercury (Hg)	2014/12/30		111	%	80 - 120
3873233	ALG	Spiked Blank	Total Mercury (Hg)	2014/12/30		107	%	80 - 120
3873233	ALG	Method Blank	Total Mercury (Hg)	2014/12/30	<0.013		ug/L	
3873233	ALG	RPD [YY3999-05]	Total Mercury (Hg)	2014/12/30	NC		%	20
3873762	ASW	Matrix Spike	D10-Anthracene	2015/01/03		87	%	30 - 130
			D14-Terphenyl	2015/01/03		131 (1)	%	30 - 130
			D8-Acenaphthylene	2015/01/03		51	%	30 - 130
			1-Methylnaphthalene	2015/01/03		126	%	30 - 130
			2-Methylnaphthalene	2015/01/03		129	%	30 - 130
			Acenaphthene	2015/01/03		117	%	30 - 130
			Acenaphthylene	2015/01/03		121	%	30 - 130
			Anthracene	2015/01/03		125	%	30 - 130
			Benzo(a)anthracene	2015/01/03		109	%	30 - 130
			Benzo(a)pyrene	2015/01/03		127	%	30 - 130
			Benzo(b)fluoranthene	2015/01/03		127	%	30 - 130
			Benzo(g,h,i)perylene	2015/01/03		128	%	30 - 130
			Benzo(j)fluoranthene	2015/01/03		124	%	30 - 130
			Benzo(k)fluoranthene	2015/01/03		121	%	30 - 130
			Chrysene	2015/01/03		116	%	30 - 130
			Dibenz(a,h)anthracene	2015/01/03		110	%	30 - 130
			Fluoranthene	2015/01/03		118	%	30 - 130
			Fluorene	2015/01/03		121	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/01/03		119	%	30 - 130
			Naphthalene	2015/01/03		109	%	30 - 130
			Perylene	2015/01/03		127	%	30 - 130
			Phenanthrene	2015/01/03		123	%	30 - 130
			Pyrene	2015/01/03		116	%	30 - 130
3873762	ASW	Spiked Blank	D10-Anthracene	2015/01/03		100	%	30 - 130
			D14-Terphenyl	2015/01/03		103	%	30 - 130
			D8-Acenaphthylene	2015/01/03		100	%	30 - 130
			1-Methylnaphthalene	2015/01/03		123	%	30 - 130
			2-Methylnaphthalene	2015/01/03		120	%	30 - 130
			Acenaphthene	2015/01/03		113	%	30 - 130
			Acenaphthylene	2015/01/03		112	%	30 - 130
			Anthracene	2015/01/03		106	%	30 - 130
			Benzo(a)anthracene	2015/01/03		103	%	30 - 130
			Benzo(a)pyrene	2015/01/03		112	%	30 - 130
			Benzo(b)fluoranthene	2015/01/03		117	%	30 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Benzo(g,h,i)perylene	2015/01/03		110	%	30 - 130
			Benzo(j)fluoranthene	2015/01/03		113	%	30 - 130
			Benzo(k)fluoranthene	2015/01/03		110	%	30 - 130
			Chrysene	2015/01/03		108	%	30 - 130
			Dibenz(a,h)anthracene	2015/01/03		89	%	30 - 130
			Fluoranthene	2015/01/03		111	%	30 - 130
			Fluorene	2015/01/03		117	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/01/03		103	%	30 - 130
			Naphthalene	2015/01/03		120	%	30 - 130
			Perylene	2015/01/03		115	%	30 - 130
			Phenanthrene	2015/01/03		108	%	30 - 130
			Pyrene	2015/01/03		110	%	30 - 130
3873762	ASW	Method Blank	D10-Anthracene	2015/01/03		103	%	30 - 130
			D14-Terphenyl	2015/01/03		104	%	30 - 130
			D8-Acenaphthylene	2015/01/03		99	%	30 - 130
			1-Methylnaphthalene	2015/01/03	<0.050		ug/L	
			2-Methylnaphthalene	2015/01/03	<0.050		ug/L	
			Acenaphthene	2015/01/03	<0.010		ug/L	
			Acenaphthylene	2015/01/03	<0.010		ug/L	
			Anthracene	2015/01/03	<0.010		ug/L	
			Benzo(a)anthracene	2015/01/03	<0.010		ug/L	
			Benzo(a)pyrene	2015/01/03	<0.010		ug/L	
			Benzo(b)fluoranthene	2015/01/03	<0.010		ug/L	
			Benzo(g,h,i)perylene	2015/01/03	<0.010		ug/L	
			Benzo(j)fluoranthene	2015/01/03	<0.010		ug/L	
			Benzo(k)fluoranthene	2015/01/03	<0.010		ug/L	
			Chrysene	2015/01/03	<0.010		ug/L	
			Dibenz(a,h)anthracene	2015/01/03	<0.010		ug/L	
			Fluoranthene	2015/01/03	<0.010		ug/L	
			Fluorene	2015/01/03	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2015/01/03	<0.010		ug/L	
			Naphthalene	2015/01/03	<0.20		ug/L	
			Perylene	2015/01/03	<0.010		ug/L	
			Phenanthrene	2015/01/03	<0.010		ug/L	
			Pyrene	2015/01/03	<0.010		ug/L	
3873762	ASW	RPD	Acenaphthylene	2015/01/03	NC		%	40
			Anthracene	2015/01/03	NC		%	40
			Fluorene	2015/01/03	NC		%	40
			Naphthalene	2015/01/03	NC		%	40
			Phenanthrene	2015/01/03	NC		%	40
			Pyrene	2015/01/03	NC		%	40
3874159	KSR	QC Standard	pH	2014/12/31		100	%	97 - 103
3874159	KSR	RPD	pH	2014/12/31	0.38		%	N/A
3874162	KSR	Spiked Blank	Conductivity	2014/12/31		101	%	80 - 120
3874162	KSR	Method Blank	Conductivity	2014/12/31	1.4, RDL=1.0		uS/cm	
3874162	KSR	RPD	Conductivity	2014/12/31	0.14		%	25
3874164	KSR	QC Standard	pH	2014/12/31		100	%	97 - 103
3874164	KSR	RPD	pH	2014/12/31	0.24		%	N/A
3874165	KSR	Spiked Blank	Conductivity	2014/12/31		101	%	80 - 120
3874165	KSR	Method Blank	Conductivity	2014/12/31	1.5, RDL=1.0		uS/cm	
3874165	KSR	RPD	Conductivity	2014/12/31	0.56		%	25
3874275	GTH	Matrix Spike [YY4010-06]	D10-Anthracene	2015/01/03		69	%	30 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			D14-Terphenyl	2015/01/03		78 (2)	%	30 - 130
			D8-Acenaphthylene	2015/01/03		75	%	30 - 130
			1-Methylnaphthalene	2015/01/03		80	%	30 - 130
			2-Methylnaphthalene	2015/01/03		84	%	30 - 130
			Acenaphthene	2015/01/03		79	%	30 - 130
			Acenaphthylene	2015/01/03		103	%	30 - 130
			Anthracene	2015/01/03		79	%	30 - 130
			Benzo(a)anthracene	2015/01/03		78	%	30 - 130
			Benzo(a)pyrene	2015/01/03		87	%	30 - 130
			Benzo(b)fluoranthene	2015/01/03		96	%	30 - 130
			Benzo(g,h,i)perylene	2015/01/03		80	%	30 - 130
			Benzo(j)fluoranthene	2015/01/03		86	%	30 - 130
			Benzo(k)fluoranthene	2015/01/03		88	%	30 - 130
			Chrysene	2015/01/03		94	%	30 - 130
			Dibenz(a,h)anthracene	2015/01/03		67	%	30 - 130
			Fluoranthene	2015/01/03		86	%	30 - 130
			Fluorene	2015/01/03		96	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/01/03		72	%	30 - 130
			Naphthalene	2015/01/03		70	%	30 - 130
			Perylene	2015/01/03		86	%	30 - 130
			Phenanthrene	2015/01/03		82	%	30 - 130
			Pyrene	2015/01/03		83	%	30 - 130
3874275	GTH	Spiked Blank	D10-Anthracene	2015/01/03		101	%	30 - 130
			D14-Terphenyl	2015/01/03		101	%	30 - 130
			D8-Acenaphthylene	2015/01/03		96	%	30 - 130
			1-Methylnaphthalene	2015/01/03		97	%	30 - 130
			2-Methylnaphthalene	2015/01/03		103	%	30 - 130
			Acenaphthene	2015/01/03		96	%	30 - 130
			Acenaphthylene	2015/01/03		129	%	30 - 130
			Anthracene	2015/01/03		96	%	30 - 130
			Benzo(a)anthracene	2015/01/03		97	%	30 - 130
			Benzo(a)pyrene	2015/01/03		104	%	30 - 130
			Benzo(b)fluoranthene	2015/01/03		102	%	30 - 130
			Benzo(g,h,i)perylene	2015/01/03		88	%	30 - 130
			Benzo(j)fluoranthene	2015/01/03		104	%	30 - 130
			Benzo(k)fluoranthene	2015/01/03		105	%	30 - 130
			Chrysene	2015/01/03		115	%	30 - 130
			Dibenz(a,h)anthracene	2015/01/03		66	%	30 - 130
			Fluoranthene	2015/01/03		108	%	30 - 130
			Fluorene	2015/01/03		118	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/01/03		84	%	30 - 130
			Naphthalene	2015/01/03		85	%	30 - 130
			Perylene	2015/01/03		100	%	30 - 130
			Phenanthrene	2015/01/03		102	%	30 - 130
			Pyrene	2015/01/03		103	%	30 - 130
3874275	GTH	Method Blank	D10-Anthracene	2015/01/03		93	%	30 - 130
			D14-Terphenyl	2015/01/03		100	%	30 - 130
			D8-Acenaphthylene	2015/01/03		99	%	30 - 130
			1-Methylnaphthalene	2015/01/03	<0.050		ug/L	
			2-Methylnaphthalene	2015/01/03	<0.050		ug/L	
			Acenaphthene	2015/01/03	<0.010		ug/L	
			Acenaphthylene	2015/01/03	<0.010		ug/L	
			Anthracene	2015/01/03	<0.010		ug/L	
			Benzo(a)anthracene	2015/01/03	<0.010		ug/L	

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			Benzo(a)pyrene	2015/01/03	<0.010		ug/L	
			Benzo(b)fluoranthene	2015/01/03	<0.010		ug/L	
			Benzo(g,h,i)perylene	2015/01/03	<0.010		ug/L	
			Benzo(j)fluoranthene	2015/01/03	<0.010		ug/L	
			Benzo(k)fluoranthene	2015/01/03	<0.010		ug/L	
			Chrysene	2015/01/03	<0.010		ug/L	
			Dibenz(a,h)anthracene	2015/01/03	<0.010		ug/L	
			Fluoranthene	2015/01/03	<0.010		ug/L	
			Fluorene	2015/01/03	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2015/01/03	<0.010		ug/L	
			Naphthalene	2015/01/03	<0.20		ug/L	
			Perylene	2015/01/03	<0.010		ug/L	
			Phenanthrene	2015/01/03	<0.010		ug/L	
			Pyrene	2015/01/03	<0.010		ug/L	
3874275	GTH	RPD [YY4009-06]	1-Methylnaphthalene	2015/01/03	NC		%	40
			2-Methylnaphthalene	2015/01/03	NC		%	40
			Acenaphthene	2015/01/03	NC		%	40
			Acenaphthylene	2015/01/03	NC		%	40
			Anthracene	2015/01/03	NC		%	40
			Benzo(a)anthracene	2015/01/03	NC		%	40
			Benzo(a)pyrene	2015/01/03	NC		%	40
			Benzo(b)fluoranthene	2015/01/03	NC		%	40
			Benzo(g,h,i)perylene	2015/01/03	NC		%	40
			Benzo(j)fluoranthene	2015/01/03	NC		%	40
			Benzo(k)fluoranthene	2015/01/03	NC		%	40
			Chrysene	2015/01/03	NC		%	40
			Dibenz(a,h)anthracene	2015/01/03	NC		%	40
			Fluoranthene	2015/01/03	NC		%	40
			Fluorene	2015/01/03	NC		%	40
			Indeno(1,2,3-cd)pyrene	2015/01/03	NC		%	40
			Naphthalene	2015/01/03	NC		%	40
			Perylene	2015/01/03	NC		%	40
			Phenanthrene	2015/01/03	NC		%	40
			Pyrene	2015/01/03	NC		%	40
3874414	CRA	Matrix Spike	Total Organic Carbon (C)	2014/12/31		NC	%	80 - 120
3874414	CRA	Spiked Blank	Total Organic Carbon (C)	2014/12/31		107	%	80 - 120
3874414	CRA	Method Blank	Total Organic Carbon (C)	2014/12/31	<0.50		mg/L	
3874414	CRA	RPD	Total Organic Carbon (C)	2014/12/31	11		%	20
3875337	KMC	Matrix Spike	Total Organic Carbon (C)	2015/01/02		100	%	80 - 120
3875337	KMC	Spiked Blank	Total Organic Carbon (C)	2015/01/02		110	%	80 - 120
3875337	KMC	Method Blank	Total Organic Carbon (C)	2015/01/02	<0.50		mg/L	
3875337	KMC	RPD	Total Organic Carbon (C)	2015/01/02	NC		%	20
3875516	KSR	QC Standard	Turbidity	2015/01/02		103	%	80 - 120
3875516	KSR	Method Blank	Turbidity	2015/01/02	<0.10		NTU	

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QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3875516	KSR	RPD [YY4010-01]	Turbidity	2015/01/02	3.7		%	25

N/A = Not Applicable

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

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

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

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

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) PAH surrogate(s) not within acceptance limits. Sample past recommended hold time for repeat analysis.

(2) PAH sample contained sediment.

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VALIDATION SIGNATURE PAGE

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

Kevin A. MacDonald

Kevin MacDonald, Inorganics Supervisor

Rose Marie MacDonald

Rose 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.